Arapaima gigas

Market Study

Current status of Arapaima global trade and perspectives on the Swiss, French and UK markets

market perspectives December 2005
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## 1. Introduction

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1. Introduction

Arapaima gigas is one of the biggest freshwater fish of the world. For millennia, it has been part of the staple diet of Amerindians living in the Amazon basin. Due to increasing human pressure, its population has been in steady decline since the 1960s and in 1975 was protected under CITES convention (the Convention on International Trade in Endangered Species of Wild Fauna and Flora), listed in appendix II. The Arapaima that is consumed in South America is mainly caught in the wild. Despite its potential for aquaculture, farming of this fish is largely anecdotic due to the lack of knowledge regarding its controlled reproduction. The flesh of this fish is not exported and is mainly consumed in local markets. Nevertheless, due to the constant growth of fish consumption in Europe and the USA, interest of fish buyers and local investors in Arapaima gigas is increasing rapidly.

The goal of this study, done on behalf of UNCTAD/BTFP, is to give to Arapaima producers, future producers from Peru and to all interested persons in this fish an overview of:

• the international trade of Arapaima and its by-products through the analysis of the CITES statistics;
• the fish buyers’ interest and market requirements for this fish in Switzerland, France and the UK through the analysis of a questionnaire mailed to approximately 400 participants;
• the situation of the Swiss, French and UK fish markets through the analysis of trade statistics (Swiss-impex and EUstats). The German market is currently an important potential outlet for Arapaima too, but it has not been dealt with in this paper because of the recent study carried out by Prompex/CAF. Nevertheless some interesting findings will be mentioned;
• possible competitor products, such as Nile perch (Lates niloticus), Basa (Pangasius sp.) and Tilapia (Oreochromis niloticus);
• Arapaima trading and sustainability issues; and
• Formalities required from the importing countries, possible tariff and non-tariff trade barriers, with the idea of helping to implement a correct strategy to develop a responsible and sustainable production Arapaima in Peru for export.

2. The species

2.1. Description of the species and its biology

Species classification:
Class: Actinopterygii
Order: Osteoglossiformes
Family: Osteoglossidae
Species: Arapaima gigas

Arapaima belongs to one of the oldest fish lineages and is part of the family of osteoglossidae, the bony-tongue fish family, along with six other species. Osteoglossidae inhabit South America, Africa, Asia, and Australia.

Distribution
Arapaima gigas, Arapaima (Peru and Bolivia) or Arapaima (Brazil), exclusively inhabits the Amazon river basin of South America and is mainly found in Peru, Brazil, Colombia, Bolivia and Guyana. It is found in several different types of habitat, such as the floodplain lakes, the large tributaries of the Amazon river, including the Río Madera and the Río Machado. Arapaima gigas inhabits both white water and clear water, much of which is also oxygen deficient as it is located in rainforest swamp land.

Development
The Arapaima is one of the largest freshwater fish in the world, reaching up to 3 meters in length and 275 kg in weight. Its colour is usually grey with scales with a red border near its tail.

Arapaima gigas must surface every 10-20 min. in order to obtain supplemental oxygen. As a result it is an easy target for fishermen.

The female Arapaima is sexually mature at five-years-old and is typically 160 centimetres at this age.
Due to the geographic range that A. gigas inhabits, the animal’s life cycle is greatly affected by the seasonal flooding that occurs. Half of the year the Arapaima experiences an abundance of water, and the other half of the year it experiences conditions of drought. The Arapaima has adapted itself to this seasonal fluctuation, including its reproduction habits. It lays its eggs during February, March, and April when the water levels are low, building a nest approximately 50 cm wide and 15 cm deep, usually in sandy areas. As the water rises, the eggs hatch and the offspring can prosper during the flood season from May to August. Therefore, yearly spawning is regulated seasonally. A. gigas is a mouth-brooder.

Food Habits
A. gigas is a predator that mainly eats other fish, but also other kinds of animal, such as birds. It usually finds food near the surface of the water.

2.2. Economic Importance for Humans
A. gigas is hunted and utilised in many ways by local human populations. Arapaima are harpooned or caught in large nets and the meat is said to be delicious. One individual can yield seventy kilograms of meat. In addition, the Arapaima’s bony tongue is often used to scrape cylinders of dried guaraná, an ingredient in a beverage; the bony scales are used as nail files.

Arapaima fishery and wild stock exploitation
The capture of Arapaima and its exploitation is strongly regulated in all countries where this fish naturally inhabits and is mainly used by local ethnic minorities. Arapaima has been exploited since the 18th century in the Amazon basin. It was dried and salted, and used as a local substitute for cod. Since the 1960s, the wild populations have decreased steadily, and since the 1980s have almost completely disappeared around the bigger Amazonian cities.

In Peru, the hunting of Arapaima is regulated by the general law of fisheries Decreto Ley n° 25977 (see Annex II). Only the wild capture of sexually mature Arapaima is permitted (min. size 150 cm) and must be outside the reproduction months from October 1 through to February 28. The capture of wild Arapaima fingerlings as ornamental fishes is prohibited. No restriction applies to farmed animals.

In early 2001 the Brazilian government banned all Arapaima fishing, except in the Mamirauá sustainable development reserve. The Mamirauá sustainable development reserve is located where the Solimões and Juruá Rivers come together, and is one of the success stories of participative management of natural resources coordinated by local and scientific communities. Arapaima lakes are monitored and fished on a rotational basis, thus preventing local overexploitation (Castello 2004; Queiroz & Crampton 1999). A further benefit of this system is price regulation, which results in a higher local income from fewer harvested fish. Because of the success of this participatory system, this management strategy has been approved in other parts of the Amazon basin, including Fonte Boa and the São Miguel Island communities.

Arapaima aquaculture
The breeding and farming of Arapaima in Peru, Brazil, Columbia, Bolivia and Guyana is currently poorly developed. The reproduction of Arapaima is only possible in outdoor ponds where fishes can spawn naturally. Small ponds of 1000 to 5000 m² are seeded with a density of one animal per 300 m². Each couple can typically produce around 1000 fingerlings per spawning. Arapaima are usually bred in polyculture outdoor ponds with forage fishes like Tilapia, Pacu or Gamitana.
In Peru the IIAP (Instituto de Investigaciones de la Amazonia Peruana) and in Brazil the INPA (Instituto de Pesquisas da Amazônia) have researched natural reproduction and growout in ponds and cages for many years. Their research has shown the exceptional qualities this fish possesses for farming purposes. Arapaima has an exceptional growth rate reaching no less than 10 kg in one year. Its ability to breathe air is also an important advantage in rearing this fish at high densities. INPA has shown that a productivity of 2.5 kg of fish per sqm was feasible (Pereira-Filho 2003) in intensive monoculture.

Up to now, the breeding of Arapaima has been considered by local authorities as a way to avoid overexploitation and to improve the livelihood of Amerindian minorities.

The lack of knowledge in reproducing Arapaima in a more intensive and predictable manner is the bottleneck which has hindered the development of Arapaima farming on a larger scale. Furthermore, the limited number of Arapaima fingerlings produced is shared among local farmers and ornamental fish exporters.

For this reason, only a few Arapaima farming projects exist, primarily in Peru and Brazil. Current production is limited and Arapaima are sold locally. Nevertheless, more and more private investors are showing interest in this fish due to its huge potential and exceptional breeding qualities.

Arapaima is reproduced in Taiwan, Thailand and Indonesia in outdoor natural ponds solely for ornamental or sporting purposes.

2.3. International protection of Arapaima and CITES status

Arapaima gigas was added to appendix II of the CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) convention in 1975. Its exploitation is therefore strictly regulated and controlled. CITES, which is an international agreement between Governments, was created in 1960 to ensure that the survival of endangered specimens of wild animals and plants would not be threatened by trade.

The 169 participating countries have to implement their own domestic legislation to ensure that CITES is respected at national level. All import, export, re-export and introduction from the sea of species covered by the Convention have to be authorised through a licensing system. Each Party to the Convention must designate one or more Management Authority in charge of administering the licensing system and one or more Scientific Authority to advise them on the effects of trade on the status of the species.

The species covered by CITES are listed in three appendices, according to the degree of protection they need. Arapaima gigas is listed in appendix II and implies that:

1. an export permit or re-export certificate issued by the Management Authority of the State of export or re-export is required. (see annex II);
2. an export permit may be issued only if the specimen was legally obtained and if the export will not be detrimental to the survival of the species;
3. a re-export certificate may be issued only if the specimen was imported in accordance with the Convention;
Arapaima farmed in outdoor ponds at the IIAP of Pucallpa / Peru

Arapaima produced by a private farm in Tarapoto / Peru

Arapaima produced in cages in the Laguna de Imina by the IIAP of Iquitos / Peru
4. in the case of a live animal or plant, it must be prepared and shipped to minimise any risk of injury, damage to health or cruel treatment; and
5. no import permit is needed unless required by national law (see annex II).

3. CITES Trade statistics analysis, current status of global Arapaima trade

Within the Convention, the establishment of statistics recording all export/imports from the member countries gives a complete overview of the Arapaima trade and that of its derivative products. All figures of this chapter are based on the trade statistics 1977-2004 of the CITES.

3.1. Arapaima gigas products and by-products exported and imported globally

Arapaima gigas offers a large array of export possibilities but the most exported product is not its meat, but live Arapaima for ornamental purposes and scales. Since 1977, 87,045 ornamental Arapaima and more than 2 million scales have been exported.

**Trade statistics 1977-2004 Cites / all products exported and recorded**

<table>
<thead>
<tr>
<th>Product</th>
<th>quantity</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>live</td>
<td>87,045</td>
<td></td>
</tr>
<tr>
<td>whole fish</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>meat</td>
<td>30,868.9</td>
<td>kg</td>
</tr>
<tr>
<td>scales</td>
<td>2,235,848</td>
<td>scales</td>
</tr>
<tr>
<td>skins</td>
<td>1,250</td>
<td></td>
</tr>
</tbody>
</table>

3.1.1. Arapaima as an ornamental fish

Arapaima is highly appreciated by aquarium hobbyists around the world, but due to its rapid growth and important size, the number of people able to purchase this species is limited. Nevertheless from 1977 to 2004, approximately 87,000 Arapaima were sold globally. The average price of Arapaima in South of America is between USD 15 and 20 per piece and represents a turnover of USD 1.74 million since 1977.

**Main exporters of living Arapaima**

The 3 most important exporters of Arapaima are Brazil, Colombia and Peru, where Arapaima is living naturally. Brazil leads the market with 32% of total exports, followed by Colombia with 21% and Peru with 16%. Taiwan is ranked fourth, with 11,608 fishes exported since 1982. Given that only 1,800 fishes have been imported into Taiwan since 2001, we can conclude that Arapaima gigas is being produced locally. This country is well known for its expertise in aquaculture and the ornamental fish industry. The USA and Singapore are also exporters of Arapaima, but all fishes were imported from the main producers and re-exported.

**Evolution of living Arapaima exports**

Since 1981, Arapaima exports have slightly increased with irregular exports from year to year. Exports are most likely driven by the production capacity of the exporters as opposed to demand. In 2001, an important increase of exports from Brazil was observed with 13,873 fishes exported (approximately 50% to China) with no indicator to the reason of this phenomenon.
Main importers of living Arapaima

Japan is without a doubt the biggest importer of live Arapaima, with 61% of all exports since 1977. The second biggest importer is the USA, with a share of 18%, directly followed by China with 10%. The main importers are all located in Asia, with the exception of the USA. Asian people are known for their interest in ornamental fish. Furthermore, fish in Asia is closely associated with prosperity, and a big fish at home can bring good luck to its owner (fengshui). Arowana, which belongs to the same family (osteoglossidae) and which is bred more easily, can reach incredible prices in Singapore (EUR 12,500 for a gold Arowana of 20-25 cm).
Evolution of Japanese imports of living Arapaima
Since 1984 the Japanese market has imported approximately 2,500 Arapaima per year and the market, despite fluctuations most likely due to irregular production, remains relatively stable.

3.1.2. The trade of Arapaima scales
Arapaima is covered with tough scales which can reach 6 cm in length, protecting the fish against caiman and other predators. Arapaima is used in many ways by local populations and scales are made into sandpaper or nail files. Amazingly, scales are one of the most important by-products exported globally. Since 1977, 2,235,997 pieces and 1,444.2 kg of scales have been exported.

Main exporters of Arapaima scales
The main exporter of scales is without doubt Brazil with 96% of total exports since 1977. The USA ranks second with 4% of re-exported scales. Colombia and Peru, with 0.36 % and 0.20% respectively, are occasional exporters.
Main importers of Arapaima scales
The USA has imported 94% of total exports since 1977. 4% has been imported by Italy and 2% by France.

3.1.3. Arapaima meat trading
Given the quality of the flesh of the Arapaima, recognised by all connoisseurs for its high quality, it was a surprise to discover that very little meat has been exported, as is known. Between 1993 and 1994, Brazil officially exported 31 tons of Arapaima meat to the USA. From 1982 to 2001, 38 whole Arapaima have been exported, principally to Japan (25 units in 1982). No other exports have been reported.

<table>
<thead>
<tr>
<th>Product</th>
<th>country</th>
<th>quantity</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>meat</td>
<td>Brazil</td>
<td>308,689</td>
<td>kg</td>
</tr>
<tr>
<td>whole fish</td>
<td>Brazil</td>
<td>38.00</td>
<td>unit</td>
</tr>
</tbody>
</table>

source: trade statistics 1977-2004 of the CITES

3.1.4. Arapaima skins
Thanks to its large size and long body shape, Arapaima offers good perspectives for the trade of its skin. In 1989, Brazil exported 1,250 skins to the USA; no other exports have been recorded since.

Main tendencies and perspectives

1. Arapaima meat is not currently globally exported. Peru could be the first.
2. Arapaima as an ornamental fish could probably be an alternative for future Arapaima fingerling producers and must not be neglected.
3. Scales and possibly skins are an important by-product and further research is necessary to explore this market.
4. Buyers interest and requirements / analysis of the survey sent to Swiss, French and UK buyers.

In order to evaluate the interest of fish buyers for Arapaima, we prepared a short presentation on this fish and on the main characteristic of its meat, illustrated with some pictures of the whole fish and fillets (see Annex II). The presentation was complemented with a short questionnaire. The questionnaire was available in English, French and German and sent to 81 Swiss buyers, 196 French buyers and 120 UK buyers, chosen among importers, supermarket chains and retailers (complete list available on demand). In order to receive the maximum number of answers, the questionnaire remained short with a stamped-addressed envelope enclosed.

The level of response was high in Switzerland at 32%, but rather low in France and UK with 6% and 5 % respectively. The higher Swiss rate could be explained by the fact that the author of the survey was well known to the buyers. The number of positive answers (willing to buy Arapaima) was 74 % in Switzerland, 55 % in France and 67% in the UK.

The questionnaires received have been analysed and the results are as follows.

4.1. Farmed or wild Arapaima

Buyers were questioned on their preferences regarding the origin of the fish: wild or farmed Arapaima. Often consumers have a bad perception of farmed animals and often prefer an animal caught in the wild to avoid antibiotic residues. Fish buyers didn't show this tendency, and the majority of them were not concerned about the origin of the fish, particularly in UK. In France, some buyers even preferred Arapaima from aquaculture, due to a more stable supply and better sustainability.

Only in Switzerland did some companies prefer wild Arapaima; for Swiss consumers it is still a criterion of quality (no antibiotic residues).
4.2. Whole or processed Arapaima

Buyers were questioned if they prefer to buy whole Arapaima, fillet or both products. The results were quite similar between Swiss, French and UK buyers, with approximately 50 to 59% of buyers only interested in fillet, and between 50 and 33% interested in both products.

source: mailing to fish buyers CH/F/UK 2005
4.3. Whole Arapaima fresh or frozen

Buyers were questioned on their preferences regarding their preferences in buying whole Arapaima. Between 42 and 75% of the buyers were only interested in frozen products and between 25 to 50% were interested in fresh or both (fresh and frozen).

Source: mailing to fish buyers CH/F/UK 2005
4.4. Fillet fresh, frozen or smoked

Preferences are quite similar in France and the UK, with roughly half of the interviewed buyers preferring only frozen fillets, a quarter willing only fresh fillet and a quarter interested in both. In Switzerland 62% are interested in both and 38% only in frozen fillets.

Buyers were questioned about smoked Arapaima. 75% of UK buyers answered positively, 31% in Switzerland and 20% in France.

source: mailing to fish buyers CH/F/UK 2005
4.5. Fillet portion or whole

For this question all buyers were unanimous with between 67 to 75% preferring a portion of fillet. The majority would like portions from 150 to 200g and blocks between 1 and 4 kg each.

source: mailing to fish buyers CH/F/UK 2005
4.6. Affordable price

It was important to get some idea about an affordable price for this product on the markets. In general, Swiss buyers readily agreed to answer this question based on pictures of the Arapaima meat. Unfortunately, it was not possible to make a presentation with samples of Arapaima.

The price varied from USD 4.55 to 12.7 per kg of frozen fillet with an average of USD 9.8. The difference came from the type of buyers interviewed. The two supermarket chains that answered this question both proposed a price of USD 11.40. Few French buyers answered this question arguing that it was not possible to quote the product without samples. The supermarket chain Auchan, to which we had sent a sample of Arapaima in a previous survey, said they would be able to charge EUR 8 to 10 per kg. We also received a few answers from UK. The supermarket chain Sainsbury said they would be able to sell Arapaima at a retail price of GBP 9.99 (USD 17.13) per kg of fillet. Another buyer said that the affordable price would be the same as Nile perch.

4.7. Affordable quantity

Buyers were interviewed about the quantity they could possibly import. It was a difficult question given that in general buyers do not want to answer such questionnaires without having the chance to test the product. However, the rate of answers received was quite good, especially in Switzerland. The majority of buyers said they would buy from 1 to 20 tons of fillet per year in order to initially test the market. Only one company would be interested in 200 tons per year. The final results in Switzerland gave the following quantities:

- Frozen fillets: 243 tons / year
- Whole Arapaima: 6 tons / year
- Smoked: 0.1 tons / year

In France, two supermarket chains said they would commit themselves to 50 tons of fillet (Auchan) and to between 10 to 100 tons of fillet per year (Intermarché). No UK buyers answered this question.

4.8. Organic or eco-friendly label

Consumers are more and more sensitive to environmental and sustainability issues. Therefore buyers were asked the question about the importance of product labelling. The large majority of the buyers said they preferred a product with a label. It was a surprise to see that in Switzerland, where consumers are known for their interest in organic and eco-friendly products, 33 % of the buyers were not interested in labelling. This could be explained by the reason why some of these buyers were only working with restaurants that were less concerned by this problem. It was also a surprise to discover that all buyers from France and the UK – without exception – were interested in certified products.

Swiss buyers preferences organic label/no label

![Swiss buyers preferences organic label/no label chart]

source: mailing to fish buyers CH/F/UK 2005
4.9. Premium

The certification of products is restricting for the producers and always implies higher production costs. In order to compensate, certified products are always paid with a premium varying among products from between 20 and 100%, and sometimes even higher. In general, this premium is well accepted in countries like Switzerland where this market is well developed and where people can afford it. The results of the questionnaire confirmed this fact with 58 % of the buyers willing to pay a premium for such a product. In France and the UK the percentage of buyers who agreed to pay a premium decreased to 20 % in France and 25 % in UK.

We believe that these results reflect a general tendency for certified products. In the future producers must see certification as a marketing strategy to help them to differentiate their products in markets. However, this cannot be seen as a solution to get a better price for their products.
Main tendencies and perspectives

1. Wild and farmed Arapaima are both appreciated, with no discrimination against farmed Arapaima.
2. Portions of IQF fillet are preferred and this is an essential condition to be able to export large quantities to Switzerland, France and the UK.
3. Smoked fillet: this option must be explored given the relatively high rate of positive answers.
4. Affordable average price for frozen fillet ranges from USD 9/kg for importers/wholesalers and approximately USD 12/kg for supermarket chains in Switzerland. Same prices can be expected from supermarket chains in France. Lower prices can be expected from big importers in France and the UK (EUR 4.5 to 5.0).
5. A label (organic or eco-friendly) is a must but a premium could only be expected in Switzerland. Labelling must be considered as a marketing strategy in France and UK.

source: mailing to fish buyers CH/F/UK 2005
5. The fish markets in Europe and Switzerland

The knowledge of each market as well as future developments is important and key to the successful introduction of Arapaima as a new product.

5.1. General trends of fish consumption

The new European consumer is young, has a relatively high purchasing power and is open to new cooking tendencies. They are attracted to exotic cooking and have less and less time to cook at home. Consequently there has been the development of convenience food and exotic ready-to-eat products. The market share of frozen value-added products is constantly on the rise. On the other hand, the percentage of the elderly population is increasing and the market dedicated to seniors is growing too. Seniors prefer to buy fresh fish.

General fish consumption in Europe continues to grow in France and Italy, and it has been relatively stable for 10 years in the UK, Germany, Switzerland, Belgium and Holland. However, all these markets have seen an important increase in value-added products.

We also saw an important shift in the distribution scheme: the progressive change in role of importers and wholesalers who no longer act solely as intermediary but as developer of new value-added products for supermarket chains. Supermarket chains such as Delhaize, Wall-Mart or Sainsbury are offering more and more elaborated products based on a select number of low-value species. Commercial catering becomes an interesting outlet for high-value species.

The development of labels to inform consumers on environmental or social issues (organic and fair trade) are on the increase. This is a direct consequence of all the scandals (dioxins, antibiotics, ESB) which have affected consumers recently. Many private and state-owned labels already exist, but important supermarket chains are also developing their own labeling system in parallel.

5.2. Swiss, French and UK Market perspectives for fish in general and freshwater fish in particular

In order to get a clear overview of the Swiss, French and UK markets we analysed the trade and customs statistics of the Swiss Customs Office through the data bank of Swiss-Impex (https://swiss-impex.ssl.admin.ch) and the online trade statistics of the European Community EUstats (http://europa.eu.int/comm/trade/issues/global/).

5.2.1 The Swiss market

Over the centuries, the Swiss have never been big fish eaters. However, the somewhat recent development of the fish market in Switzerland in the last 50 years has mainly been due to the surge of immigrants from Italy, Spain and Portugal in the middle of the last century. Since this period, the Swiss have become bigger fish eaters. They also travel a great deal and have learnt to appreciate fish from all around the world. Nevertheless, Swiss consumers prefer fish with white flesh and a very mild taste. This is in contrast to Southern European consumers who eat sea fish and prefer products with a more distinctive taste.

In 2004, Switzerland imported 26,000 tons of fish (whole and fillets fresh, frozen). Since 2000, the fish market has been rather stable and has seen an increase of just 2.56%.

![Fish imports in Switzerland 2000-2004](source: Swiss-Impex 2000-2004)
In 2004, the majority of imported fish in Switzerland was in the form of fresh and frozen fillets with a share of 56 %, followed by frozen raw fish with a share of 33%. It is no surprise that Swiss consumers prefer fillets. The Swiss consumer has high purchasing power and prefers to buy ready-to-eat, high-quality products. In this regard, the Swiss market is often seen as a good indicator of the future evolution of other European markets, indicating future trends. The high percentage of certified products compared to other European markets is a good example of this.

Freshwater fish
The freshwater fish imports have shown the strongest increase since 1994 among all imported products. Between 1994 and 2004, imports grew 63 %, and since 2000, 21%.

The Vietnamese Pangasius is very popular in Switzerland due to its white flesh and its mild taste. Nile perch has also been introduced to the Swiss market but its success has been jeopardised by environmental issues. Supermarket chains like COOP that have removed this product from their shelves following the press scandals and the recent movie made by a Swiss screen writer on the Nile perch industry (http://www.darwinsnightmare.com).
5.2.2 The French market

French consumers are known for their love of fish, especially fish originating from the south of France. In 2004, France imported approximately 564,000 tons of fish (fresh, frozen and fillets). This is the biggest fish market among the three countries we examined in this study. The fish market has grown 25% since 2000, despite the drop of imports in 2002 following the events of September 11.

In 2004, France imported a majority of fish fillets with a share of 48% of all imports. Imports of fresh raw fish represents an important share too of 39%.
**Freshwater fish**

In 2004, France imported 19,800 tons of freshwater fish representing 3.5 % of total fish imports. Between 2000 and 2004, freshwater fish imports grew by 87 %, approximately three times the increase of total imports.

![Freshwater fish imports in France](chart1)

*source: EUstats 2000-2004*

Fresh and frozen fillets represent a majority of total imports with shares of 50 % and 19% respectively.

![Freshwater fish imports sharing in France in 2004](chart2)

*source: EUstats 2000-2004*
5.2.3 The UK market

Despite the fact that UK inhabitants are not known to be big fish eaters, in 2004 they imported a total of 333,000 tons of fish. Since 2000, the market has been in a state of fluctuation. Since 2001, the UK market for fish has seen a significant drop, probably influenced by the known international events. Since 2000, the market has increased by 17.6%.

The market share of imports in 2004 show a similar pattern to the French market, with 50% of total imports represented by fresh and frozen fillets.
The freshwater market in the UK is surprising, with a sharp and continuous increase of imports. Since 2000, the market has seen a progression of 95%! 13,641 tons of freshwater fish were imported in 2004, representing 4.1% of total fish imports.

![Freshwater fish imports in UK](source: EUstats 2000-2004)

The market share of imports in 2004 reveals interesting information. Frozen raw freshwater fish represents 87% of the market, followed by frozen fillets with 12% of the market.

![Freshwater fish imports sharing in UK in 2004](source: EUstats 2000-2004)

The following graph compares French and UK imports of freshwater fish. Both have seen a heavy increase since 2000, but the French market shows an even greater increase for 2004. The reason for this significant increase is not unknown. In 2004, the main exporting countries responsible for this increase were the Netherlands and Uganda respectively. We can therefore conclude that it was mainly Nile perch. Uganda is one the main producers and the Netherlands is one of the main importers in Europe with companies such as Anova.
Main tendencies and perspectives

1. Fish imports in Switzerland, France and UK are constantly growing.
   - Switzerland: 2.4% between 2000 and 2004
   - France: 25% between 2000 and 2004
   - UK: 17.6% between 2000 and 2004

2. Freshwater fish imports in Switzerland, France and UK have shown an important increase and are always superior to the whole fish market increase tendency.
   - Switzerland: 21% between 2000 and 2004
   - France: 87% between 2000 and 2004
   - UK: 95% between 2000 and 2004

3. Fresh and frozen fillets are the main products imported in Switzerland and France, with 91% and 69% of total imports respectively.

4. Switzerland prefers **frozen fillet**.

5. France prefers **fresh fillet**.

6. UK imported mainly **raw frozen freshwater fish** with a share of 87%. Freshwater fish are imported from Myanmar, Bangladesh and Indonesia. We can assume that in the UK freshwater fish are most likely consumed by ethnic minorities who prefer whole fish.
6. Possible competitors (other countries/continents) and possible substitutes (other fish)

Where there is the goal to farm and/or exploit wild stocks of a new species, it is important to evaluate the potential competitors. There are two kinds of competitor: those with similar products already on the market, and possible future producers of Arapaima who would be able to compete in the same markets.

6.1. Similar products on the market

The market for tropical freshwater fish in the EU is mainly shared by three products: the Nile perch (\textit{Lates niloticus}) from Kenya, Uganda and Tanzania, the Basa (\textit{Pangasius sp.}) from Vietnam, and the Tilapia (\textit{Oreochromis niloticus}) mainly from Taiwan, China, Brazil and Ecuador. In 2004, the leader was Nile perch with 56,000 tons imported (20% more than in 2003), the second product was the Basa with 20,000 tons imported in 2004, and finally the Tilapia with a modest import of just 7,000 tons in 2003 (2004 data are still not available).

Due to antidumping in the USA, Vietnam has exported the majority of its production to Europe which has greatly affected the tropical freshwater fish market. The low price of the Basa is its main advantage (EUR 2.16/kg of fillet 2005 Globefish) and forced the Nile perch unit price to fall to EUR 3.43/kg in 2005.

In Switzerland, the tropical freshwater market is led by the Vietnamese Basa; the Nile perch and Tilapia have never experienced the same success as they have in Europe.

Based on discussions with fish importers, there is no doubt that the closest product on the market at the moment is the Nile perch (\textit{Lates niloticus}). The case of the Nile perch is particularly interesting and can offer useful information to Arapaima producers as to how such a product can rapidly become a market leader. Nile perch could in fact be seen as a competitor product on the market, but it could also be considered as an opportunity for Arapaima producers to partially replace a product.

6.1.1 The Nile perch (\textit{Lates niloticus}) case

Nile perch (\textit{Lates niloticus}) are large freshwater fish found in the rivers and lakes of Africa. The Nile perch were introduced to Lake Victoria in the late 1950s, where they have been commercially fished ever since.

The introduction of Nile perch to Lake Victoria and several other lakes in Africa caused severe devastation and has led to the loss of many native species.

The three main bordering countries of Lake Victoria are Tanzania, Kenya and Uganda. These are the main exporters of this fish to Europe providing a major source of revenue for local fishermen, processors and exporters.

Nile perch is now accepted by consumers in many European markets as a regular whitefish product with the exception of the United Kingdom. Nile perch is imported to Europe through Belgium and the Netherlands, the main importers. Nile perch is re-exported mainly to Spain (the biggest market in Europe) and Portugal where it is headed and gutted and to Italy, Germany, Austria and France as fillets. Nile perch is mainly exported fresh; out of 36,200 tons exported in 2003, only 9,000 tons were frozen.

Weekly consumption in Europe is estimated between 600 to 800 tons of fillet. Since 1997, the exports from Tanzania, Uganda and Kenya have grown by 80% reaching 45,000 tons of fillets exported to Europe. In 1999, exports dropped to 8,433 due to an EU ban, but since then have rapidly recovered.
The value of Nile perch fillet reached nearly EUR 5.00 in 2002 and dropped to EUR 3.20-3.00 in August 2004 (wholesale price EUR 4.50 to 5.00) due to competition with cheap products, such as Pangasius from Vietnam (EUR 2.50/kg). Nile perch are mainly sold in supermarket chains in retail packs of 200 to 400g at the high price of EUR 20/kg.

**Market perspectives**

It is believed that Nile perch imports in the EU continue to grow, but increasing competition with low price products from Asia (Pangasius, Tilapia) could impair this. Environmental issues can significantly affect the marketing of this fish, and the recent movie, entitled ‘Darwin’s nightmare’ by Hubert Sauper showing the trafficking of weapons and prostitution associated with the trade of Nile perch, will probably also affect exports considerably. The supermarket COOP in Switzerland has already stopped selling this product following customer complaints.

In this regard, the discussion we had with Auchan, the French supermarket chain, about Arapaima was very interesting. Auchan currently imports 1,000 tons of Nile perch fillets per year and is looking for a product to substitute it due to the problems of future sustainability and supply. Auchan informed us that Arapaima could be the product they are have been looking for if supply can be guaranteed.
6.1.2 The case of Basa (Pangasius sp.)

The river catfish Basa is farmed in Vietnam in the Mekong River located in the An Giang province. Fish are farmed in cages or enclosures directly in the Mekong at high densities (80-100 kg/m$^3$). Basa reaches 1 to 1.5kg with 8 months of intensive culture. Basa farming is rapidly expanding and in the first 9 months of 2005, Vietnam exported 89,300 tons of fish which generated USD 212.3 million (globefish.org). This represents a 58% increase compared to the same period of 2004.

37.3 % of its production is currently exported to the EU and it is believed that this share will continue to grow. The main advantage of Basa is its low price which has a big impact on the Nile perch and Tilapia market. The price of Nile perch decreased from EUR 5/kg in 2002 to around EUR 3/kg in 2004. Basa producers now need to invest to update their processing and exporting facilities in order to meet EU requirements in terms of food safety and traceability, which will probably affect prices in the future. Basa producers are also intending to propose new value-added products; the first organic Basa farms were certified by Naturland in 2004.
6.1.3 The Tilapia (*Oreochromis niloticus*) case

Tilapia is a market leader in the USA where it reached record highs in 2004. In the EU, Tilapia is beginning to grow, but unfortunately the huge increase in Basa imports have hindered its development. According to globefish.org investigations, the main markets in Europe seem to be the UK and, to a lesser extent, France and Belgium. Imports are mainly whole frozen fish, but fillet imports are increasing. Taiwan and China are the main importers. The imports have been rather stable since 2001, with approximately 7,000 tons. Data are still not available for 2004, but the imports are believed to have decreased due to strong pressure from Basa imports. The Tilapia market in Europe was estimated at 10,000 MT per year, but its development will most likely be jeopardised by Vietnamese imports.

6.2 Status of the Arapaima gigas aquaculture outside Peru

6.2.1 Arapaima farming in South of America

Information on Arapaima farming projects in Brazil, Colombia or anywhere else it is farmed in its natural habitat in South of America is scarce. A project called the Clear River Aquaculture Project (*Projeto Rio Limpo*) was launched in Brazil to farm Arapaima in cages by an entrepreneur in the region of Campo Grande, but the project seems to have failed. In 2002, a British company called Superfresh Ltd advertised Arapaima imports from Brazil on the web. This company was contacted for a quotation for such imports, but they gave no response. Furthermore, no imports appeared in the CITES statistics.

The problem encountered in Peru to produce fingerlings on a regular basis is probably faced by all farmers in this area and is preventing development on a larger scale.

6.2.2 Arapaima farming in the rest of the world

Arapaima are produced in Taiwan (11,608 Arapaima exported since 1982), Singapore and Thailand for ornamental purposes. Arapaima fingerlings are produced in outdoor ponds as in Peru. There is currently no production of Arapaima for human consumption in Asia. However, if demand continues to grow we can expect Asian farmers to begin to do so in the near future. Furthermore, atmospheric conditions in the South East of Asia are similar to those of the Amazon region.

Arapaima, due to its air breathing capacity and strong growth potential, could be seen by some European or American fish farmers as a good candidate for intensive breeding in a recirculating system. In Europe and the USA, some producers are equipped with fish farming facilities that recirculate the water making it possible to farm warm-water fish like Tilapia or stripped bass. Some flow-through farms exist in Europe and the USA, which re-use warm water from nuclear plant cooling towers. There is a risk that in the future Arapaima will also be farmed in the northern hemisphere, but production potential would be limited to a few hundred tons and production costs would be much higher.

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**Main tendencies and perspectives**

1. Arapaima can be compared to tropical freshwater fish, which are already on the EU and Swiss markets. These products are Nile perch, Basa and Tilapia respectively.

2. These products are well established on the markets and benefit from being sold at a very low price. The quantity imported is considerable and will continue to increase.

3. The market leader, Nile perch, is under stress due to environmental and social issues linked to its production in Africa.

4. There is a risk that in the future Arapaima will not only be produced in Peru but quite likely in South America, Asia and, to a lesser extent, in Europe and USA.
7. Arapaima farming / fishery and sustainability issues

Arapaima gigas is an endangered species and is listed in appendix II of the CITES convention. Environmental issues are therefore of prime importance for the farmers and everyone involved in its exploitation and marketing. These issues can be considered as a handicap by some, but we firmly believe that the development of Arapaima production in Peru cannot be done without taking sustainability aspects into account and therefore must be viewed and marketed as such to its advantage in EU and Swiss markets.

European and Swiss consumers are highly environmentally aware. The development of this awareness is a direct consequence of all the problems that the agro-industry has faced over the last few years, such as BSE of bovines, dioxin contamination of chicken, antibiotic residues in fish, environmental pollution, and so on, all of which have significantly affected consumer habits. Since the 1990s, another direct consequence has been the development of labels informing consumers on the method of production and quality of what they eat. The most renowned and established label is the organic one, which can only be applied to farmed animals (Naturland, Bio Suisse, AB, Soil Association, etc). Other labels exist, such as the MSC label (Marine Stewardship Council) that promotes responsible fishing practices, and fair trade labels that promote fair trade and socially acceptable conditions to farmers in developing countries (FLO, Max Havelaar, Transfair, etc). All these labels are now well established in the UK, French and Swiss markets and are carried by the major supermarket chains.

This has been confirmed by the high level of interest in labelling seen in the questionnaires sent to fish buyers in Switzerland, UK and France.

Today, despite the growing demand of certified products, they still suffer from a lack of standardisation. Each country has its own labels known by its consumers. For example, it would difficult to sell an organic product certified by a German certification body like Naturland on the Swiss market given that Swiss consumers only know the Bio Suisse label. Therefore, it is very important that the producer who wants to certify his products choose the right label for the right market. Consumers’ or buyers’ sensitivity can also vary from one country to the other. It seems that French consumers are more sensitive to social rather than environmental issues; this is not true for UK and Swiss consumers.

7.1.1 Organic labels

Organic labels only apply to farmed products and are based on the way they are produced. Organic certified aquatic organisms are reared according to rigorous animal welfare standards and given a diet of natural feed. Use of chemical, pesticides and antibiotics are also prohibited. (For more information about organic standards: http://www.naturland.de/englisch/n2/NL-Stand-Aquaculture_01-2005.pdf).

There are no unified procedures for organic certification for aquaculture and each country has its own regulations and labels. The majority of organic labels are private initiatives but some, such as AB in France, are state-owned labels. In Switzerland, the most recognised label is the Bio Suisse label, in France the government’s AB label and in the UK the soil association label. Re-certifications are possible between certifiers meaning that a product certified by Naturland can obtain the Bio Suisse label due to a certifiers agreement; however, this unfortunately is not always the case.
The market for organic products

For 10 years, organic certified products have been one of the fastest growing sectors of the agro-food industry. In 2002, the most important markets for organic products were (source: International Trade Center) the USA at USD 11.75 billion, Europe at USD 10.5 billion and Japan at USD 0.35 billion.

In 2003, within the EU market, the UK ranked second place in the EU markets just behind Germany with an estimated turnover of between USD 1,550 and 1,750 million (source: International Trade Center). France ranked fourth place, behind Italy, with a turnover of between USD 1,200 and 1,300 million. Switzerland ranked fifth, despite its small size, with a turnover of between USD 725 and 775 million but with the highest percentage of total food sales of between 3.2 and 3.7 %.

The most optimistic estimates for future annual growth of organic markets for the UK, France and Switzerland are between 5 and 15 % per year.

Sales channels for organic products

At the beginning of certification, a product certified as organic was mainly distributed at farm gates or in small specialised shops. However, with the increasing success of this sector, supermarket chains are now the main distributors of these products. In Switzerland, 75 % are distributed by two of the biggest supermarket chains (50% Coop and 25% Migros respectively). In France 42% were sold through retail chains, 28 % through specialised organic shops, and 23 % through weekly markets and direct sales. In the UK, 80% is sold by retailers, 11% by Independant/Health Food shops and 9 % through local and direct sales (source SIPPO/FiBl).

Consumer profile

Buyers of organic products are well educated and economically well-off. The motivation of these consumers is driven by environmental concerns and health issues, as shown in the following graph.

In Switzerland ,17% of customers purchase organic products several times a week, 38% of consumers purchase organic products at least once a week, 28% less than once a week and 17% never buy organic products.
### Organic aquaculture status

Organic labels were originally only applied to agricultural products. However, given the increasing interest in aquaculture, many initiatives have been launched to certify fish, shrimp and shellfish around the world. The volume of certified products is still low, and organic aquaculture is still in its infancy. Salmon is currently the most certified of products on the organic market.

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<tr>
<th>Certified organic farms/farmers Â groups</th>
<th>Area [ha]</th>
<th>Production [t]</th>
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<td>Domestic markets; Austria; Benelux; France, Germany, Switzerland, (USA)</td>
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<td>Carp and Trout (Austria, Germany, Switzerland, UK)</td>
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<td>White Shrimp (Ecuador, Peru)</td>
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<td>9</td>
<td>2.000</td>
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<td>Black Tiger Shrimp (Indonesia, Vietnam)</td>
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<td>Black Tiger Shrimp (Thailand)</td>
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<td>Microalgae (USA, Taiwan a.o.)</td>
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<td>Mussels (Ireland, New Zealand)</td>
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<td>&lt; 500</td>
<td>Europe, USA</td>
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1) without hatcheries
2) for shrimp: head-on; for fish: round weight

Source: Naturland 2005

Naturland, the German organic certification body, is currently the most advanced regarding certified aquaculture. Nevertheless, other organic certification bodies, such as AB in France, Soil Association in the UK, Bio Suisse in Switzerland and Biogro in New Zealand, among others, also have certified aquaculture products.

### 7.1.2. Other labels

#### The Fairtrade label

Consumers are not only sensitive to environmental issues but also to social problems encountered by small producers around the world. Many associations like Max Havelaar, FLO, Transfair and World Shops are offering fair trade certification of products like coffee, tea, cocoa, fruits and honey. Currently no products from aquaculture or fisheries are certified under these schemes, but the interest is there and FLO is now working on a possible certification for shrimp farmers. This kind of certification is particularly well adapted for small-scale farmers and artisanal fishermen, and could be also considered for the case of Peru. The combination of both certifications, organic and fair trade, can make a product more attractive to EU consumers.

#### Marine Stewardship Council (MSC) label

The MSC is an independent, non-profit organisation set up to find a solution to the problem of over fishing. MSC was created by Unilever, the biggest buyer of fish in the world, and WWF. Its goal is to promote sustainable and well-managed fisheries. Standards have been developed with scientists, fisheries experts, environmental organisations and are based on the following principles:
Principle 1
The condition of fish stocks.
This examines whether there is enough fish to ensure that the fishery is sustainable.

Principle 2
The impact of the fishery on the marine environment.
This examines the effect that fishing has on the immediate marine environment, including other non-target fish species, marine mammals and seabirds.

Principle 3
The fishery management systems.
This principle evaluates the rules and procedures that are in place, as well as how they are implemented, to maintain a sustainable fishery and to ensure that the impact on the marine environment is minimised.

Today, 223 products bear the MSC label in 24 countries. Fisheries such as Alaska Pollock - Bering Sea and Aleutian Islands, Alaska salmon, Burry Inlet Cockles, New Zealand Hoki, Loch Torridon Nephrops, Mexican Baja California Red Rock Lobster, South African Hake, South Georgia Toothfish, South West Mackerel Handline, Thames Herring and Western Australian Rock Lobster have been certified.

MSC has never certified freshwater small-scale fisheries and the certification of wild Arapaima would be certainly attractive to the producers, as well as to MSC.

The BioTrade Initiative
This program was launched by the United Nations Conference on Trade and Development (UNCTAD) in 1997 following the new challenges set by the Convention on Biological Diversity (CBD).

Different programs and national initiatives have been launched since then on three continents involving companies that produce sustainable BioTrade products such as flowers, cocoa, ingredients and ornamental fish.

The program has developed a set principles that BioTrade products need to fulfil as follows:
1. Conservation of Biodiversity.
2. Sustainable use of biodiversity.
3. Equitable sharing of benefits derived from the use of biodiversity.
4. Socio-economic sustainability (management, production and markets).
5. Compliance with national and international legislation and agreements.
6. Respect for the rights of actors involved in Biotrade activities.
7. Clarity about land tenure, use and access to natural resources and knowledge.

As mentioned in the discussion paper elaborated by Pi Environmental consulting 2006, the producers taking part in the program have expressed their willingness to be recognised by the market for their efforts as this is currently done through a conventional certification program. Given that it would be difficult for a new label to establish itself in the market among the multiple labels that already exist, it would more cost effective and meaningful to rely on existing certification schemes such as organic, fair trade, and so on.

Today, it is particularly difficult for a producer to choose the right label given that market and buyer requirements can vary considerably between countries. Furthermore it is not unheard of for a buyer to ask for two labels on the same product, such as organic and fair trade. It is particularly expensive and difficult for a producer to achieve this goal.

The BioTrade Principles cover all aspects of existing labels with a varying range of compatibility, depending on the product, as mentioned in the Pi study.
The BioTrade Initiative, in search of flag-ship products, could use Arapaima in the fishery sector and develop BioTrade guidelines compatible with the organic and fair trade certification, for example. It would be particularly useful for producers to fulfil only one set of requirements allowing multiple certification at once. Development of such guidelines is possible as demonstrated by this study with the technical guidelines established for scallop farmers in Peru that are recognised by Naturland. This kind of initiative could be easily accepted by existing certification organisations, without creating competition in the markets and benefiting from their existing image.

Other labelling options

Naturland the German organic certifier is currently willing to develop guidelines for sustainable small-scale fisheries that could be also an option for Arapaima fishers.

Important supermarket chains in Europe and Switzerland (Carrefour, Auchan, COOP, Migros, etc.) are developing their own label and internal guidelines to promote sustainable products within their shops. Such a partnership could be also envisaged by Peruvian producers.

We strongly believe that from the outset Arapaima producers must showcase their products as sustainable and responsible products. Arapaima will have to compete with products such as Nile perch \((Lates niloticus)\), Vietnamese Basa \((Pangasius sp.)\) and Tilapia \((Oreochromis niloticus)\). All these products are caught in the wild or farmed industrially in a non-responsible way (except for a few producers that are already certified) and are sold at a price which makes it difficult for Arapaima producers to ensure long-term sustainability. This is actually an opportunity to enter the market with an attractive product which could be sold at a higher price.

Main tendencies and perspectives

1. Arapaima gigas is an endangered species and is listed in appendix II of the CITES convention. Environmental issues are therefore of prime importance.
2. Sustainable and environmentally friendly products are demanded by the EU and Swiss markets.
3. Arapaima will have to compete on the EU and Swiss markets with cheap products such as Nile perch and Basa. A certification will improve the competitiveness of Arapaima.
4. A certification can help to obtain a better price on the Swiss market and to a lesser extent on French and UK markets.
8. EU and CH import requirements and formalities / tariff and non-tariff barriers (all necessary resources and addresses can be found in Annex III)

8.1. EU imports requirements and formalities

8.1.1. Tariff and duties applied by the EU for imports from Peru

Third country duty
The “third country duty” is the normal Community rate applicable to imports from third countries. The third country tariff is 8% but in the case of Peru it is reduced to 0%. Peru is a founding member of the Andean Community Free Trade Area, which it rejoined in 1997 after a period of 5 years' absence. However, the country is not yet a full member of the free trade area. The EU and the Andean Community have a Framework Agreement for cooperation, signed in 1993. Since 1990, the countries of the Andean Community have enjoyed preferential duties for their exports to the EU for making efforts in the fight against drugs. These preferences were later extended to the Central American countries. Nearly 90% of Andean and Central American products, including textiles and most agricultural products, enter Europe duty-free.

Additional information can be found on the “TARIC” database from DG TAXUD. (http://europa.eu.int/comm/taxation_customs/dds/en/tarhome.htm).

Value added taxes (VAT)
For the United Kingdom
A tax rate of 0% applies to fish, crustacean and mollusc fit for human or animal consumption. A tax rate of 17.5% applies to ornamental fish, fish for aquaria and products which are unfit for either human or animal consumption.

For France
A tax rate of 5.5% applies to fish, crustacean and mollusc fit for human or animal consumption, as well as ornamental fish, fish for aquaria and products which are unfit for either human or animal consumption.

8.1.2. Non-tariff legal requirements

8.1.2.1 General formalities in the UK and France

Arapaima intended for human consumption
For all imports of Arapaima intended for human consumption in France and the UK (procedures are harmonised within the EU) the following requirements apply:

CITES-endangered species listed in Appendix II
The following procedures must be carried out:

1. An export permit must be issued by the competent authorities of the country of export.
2. A copy of the export permit must be forwarded to the EU importer.
3. Application for an import permit, attaching the copy of the export document, to the relevant EU CITES Management Authority (see Annex II for addresses).
4. Forward the original import permit to the non-EU exporter.
5. Both export and import documents must accompany the shipment and must be presented to custom services at each border control before the shipment is introduced into the EU.

Health control of fishery products intended for human consumption
The general health requirements for importing these products into the European Union (EU) are related to:

1. Country Health Approval;
2. Approved establishment;
3. Health certificates; and
4. Health control.

Hence, these products can only be imported into the EU if they come from an approved establishment of a third country that has been authorised to export those products to the EU, are accompanied by the proper health certificates, and have passed the mandatory control at the pertinent Member State’s border inspection post (BIP). Peru was given country health approval for the export of fishery products to the EU (and by extension the EEA) in 1995, via Commission Decision 95/173/EC, which was published in Official Journal L 116 of 23/5/0995, page 41. The health certificate is set out in the Annex of this Decision and the original list of approved establishments in Annex B. The current list of approved establishments, last updated 15/7/2005, is available on the website: http://forum.europa.eu.int/irc/sanco/vets/info/data/listes/11pe.pdf.

Labelling for fishery products

Fishery products marketed in the European Union (EU) are subject to the general labelling rules for foodstuffs, general labelling rules for fishery products and specific labelling rules for certain fishery products subject to harmonised marketing standards.

In accordance with the Regulation (EC) 104/2000 (OJ L-17 21/01/2000) and Regulation (EC) 2065/2001 (OJ L-278 23/10/2000), the following information must be provided on the labelling or packaging of the fishery product, or by means of a commercial document accompanying the goods:

1. Commercial and scientific designation of the species. For this purpose, Member States publish a list of the commercial designations accepted in its territory.
2. Production method (caught at sea or in freshwater, or resulted from aquaculture) indicated by the harmonised terminology
3. Catch area:
   - Caught at sea: one of the areas mentioned in the annex to the Regulation 2065/2001;
   - Caught in freshwater: reference to the country of origin;
   - Aquaculture: reference to the country in which the product is farmed.

Other documents are required or recommended as commercial invoice, customs value declaration, freight insurance, customs import declaration, freight documents and a packing list. Further information can be obtained from the export helpdesk for the developing countries website of the EU (http://export-help.cec.eu.int/thdapp/index.htm).

Arapaima as ornamental fish

Same procedures are required especially regarding the CITES formalities but normally no health certificate is required for ornamental fish.

8.1.2.2 Formalities for beneficiary countries of the EU’s GSP

Products originating in the beneficiary countries of the EU’s GSP shall benefit from the preferential duty rates foreseen upon submission of either a certificate of origin Form A or, in specific cases, an invoice declaration given by the exporter.

1. Certificate of Origin Form A

This document confirming the preferential origin of the goods is issued by the competent governmental authorities of the beneficiary country on application.

The exporter applying for the issue of this document shall be prepared to submit, at the request of the competent governmental authorities of the beneficiary country, all appropriate documents proving the originating status of the products concerned.

2. Invoice Declaration

An invoice declaration may be made out by any exporter for any consignment containing originating products whose total does not exceed EUR (€) 6,000.
The exporter making out an invoice declaration shall be prepared to submit, at the request of the competent governmental authorities of the beneficiary country, all appropriate documents proving the originating status of the products concerned.

An invoice declaration shall be made out by the exporter either in English or French by typing, stamping or printing the text which appears in Annex 18 of Regulation No. 2454/93, as amended, on the invoice, the delivery note or another commercial document. If the declaration is handwritten, it shall be written in ink in printed characters. Invoice declarations shall bear the original signature of the exporter in manuscript.

3. Period of validity of proof of origin
The period of validity is ten months.
Exemptions from the requirement to present proof of origin. The maximum value limit of the exemption from the requirement to present a proof of origin for small packages sent from one private person to another is EUR 500 and for goods contained in travellers’ personal luggage, it is EUR 1,200, always provided that such products are not imported by way of trade.

8.2. CH imports requirements
Import requirements for Switzerland are not so different from those of the EU. Bilateral agreements have pushed Switzerland to harmonise its legislation with the EU. Nevertheless some differences do exist.

8.2.1. Tariff and duties applied by CH for imports from Peru
Switzerland applies for countries under the GSP (Developing countries and territories) list a tariff of 0%, like the EU.

Value added taxes (VAT)
A tax rate of 2.4% applies to fish, crustacean and mollusc fit for human or animal consumption. A tax rate of 7.6% applies to ornamental fish and fish for aquaria.

8.2.2. Non-Tariff legal requirements
8.2.2.1 General formalities in Switzerland
Arapaima imported for human consumption
CITES-endangered species listed in appendix II
Same procedures as the EU.

Health certificate and approved exporters
According to Article 40 of the EDAV (Swiss Veterinary Services), suppliers abroad are regarded as recognised if they are in possession of a license from an EU Member State, or in the case of third countries, certification by the EU. The license or certification numbers must be entered on the health certificates.

Imports to Switzerland are only permitted from countries/regions which also satisfy the criteria for imports as laid down by the authorities for animal diseases (applicable country lists can be downloaded from http://www.bvet.admin.ch). At present, Peru belongs to the list of authorised countries.

Fish imports can only be done by recognised and accredited companies by the Federal Veterinary Office in Switzerland. A health certificate must be filled in and can be downloaded directly from http://www.bvet.admin.ch/einfuhr/00243/00247/00794/index.html?lang=en.

Health control of live animals (ornamental Arapaima)
In Switzerland no health certificate is necessary for ornamental fish.

Labelling for fishery products and other requirements
The Swiss government has adopted the text of the EU regulations for food safety and the new harmonised regulations...
will be enforced from January 1 of 2006 (for more information: http://www.bag.admin.ch/verbra/lebensmi/lmrecht/revisionen/f/index.htm).

**Arapaima as ornamental fish**

Same procedures are required in the EU, especially regarding the CITES formalities. However, in Switzerland no health certificate is necessary for ornamental fish.

**8.2.2.2 Formalities for beneficiary countries of the EU’s GSP**

Products originating in the beneficiary countries of the Swiss GSP shall benefit from the preferential duty rates foreseen upon submission of a certificate of origin Form A Generalised System of Preferences, Certificate of Origin Form A as for EU imports.

**9. Conclusions and recommendations**

*Arapaima gigas* offers without doubt great perspectives for French, UK and Swiss markets. All buyers who had the chance to see or taste the meat of this fish were enthusiastic and highlighted its qualities (colour, texture, taste, etc). This has been confirmed by the study done by Reinaldo Udewald WECO GmbH 2006 on the German market perspectives for Peruvian farmed fish. Tasting sessions held for German consumers with samples of *Arapaima, Colossoma macropum* (Black Pacu) and *Brachyplatistoma flavicans* (Dorado) have highlighted the excellent and superior quality of the Arapaima meat (color, texture, taste). Opportunities by Prompex to taste this fish during the ESE fair in Brussels in 2005 confirmed these findings yet again.

Furthermore, the majority of farmed fish offer only few possibilities to develop added-value products other than fillet. Arapaima, thanks to its large size, offers many possibilities to prepare portions of different sizes, slices, and so on.

The leading products on the EU and Swiss markets for freshwater fish are the Nile perch and the Basa. These products have the big advantage of a low selling price and it will be difficult for Arapaima producers to compete with such prices. On the other hand, the environmental and social issues linked to their production, particularly Nile perch, are being increasingly taken up by consumers. Arapaima can offer a sustainable alternative to these products, especially in Switzerland where consumers are sensitive to these issues. It is difficult to make a forecast on the potential of Arapaima exports towards Europe and Switzerland, but a target could be set to replace 10% of the current Nile Perch market share, which would represent approximately 6,000 tons of fillet per year. If this hypothesis is confirmed, it will represent 12,000 tons of raw fish and a conservative annual turnover of EUR 60 to 100 million.

Unfortunately, Arapaima production is still in its infancy at present and the quantity farmed or caught in the wild today is not enough to offer a realistic possibility for export on a regular basis. A constant and regular supply of Arapaima is essential for the successful development of this species in Europe.

**Recommendations**

1. All efforts must be made to support the development of Arapaima farming and wild stock sustainable exploitation in Peru to increase exportable quantities (technical support to breeding centres, improvement of processing facilities, training of exporters on EU and Swiss food safety requirements and so on).

2. All Arapaima producers in Peru must work closely together to be able to reach the minimal quantity needed to export to Europe and Switzerland as soon as possible. A producer association could be created to coordinate efforts.

3. As long as a minimal exportable quantity has not been reached by Arapaima producers, no more advertisement on international fairs and magazines should be done in order to avoid tarnishing the credibility of producers and disappointing future customers.

4. Information gathered on prices that European and Swiss buyers can afford must be used to carry out a feasibility study using the actual production costs. Discussions with actual Arapaima producers should give us information about the viability of the project and about the current constraints and prioritisation of efforts and investments.

5. It is strongly advised that when the minimal quantity of exportable Arapaima is reached that the Swiss market be targeted first where a higher price is expected to be achieved. This situation will favour the take-off of Arapaima.
production in Peru.

6. Development of Arapaima production in Peru can only be done in a sustainable way. National initiatives must be enforced by governments to avoid negative environmental impacts.

7. From the outset, Arapaima producers must create the image of their product as responsible and sustainable in international markets. The development of a certification program at a national level would be necessary and could be done using the framework of the BioTrade Initiative. The protection of the Amazon eco-system must be used as a marketing strategy.

8. Currently the most popular label on the market, and especially in Switzerland, is the organic one. It is therefore suggested that guidelines be developed within the framework of the BioTrade Initiative allowing an organic certification for farmed Arapaima and those caught in the wild with certification bodies like Naturland and/or Bio Suisse. At present, this would be easier given that no standards have been developed for this species and organic certification bodies like Naturland have already expressed their interest in cooperating.

9. A joint approach, together with all the countries where Arapaima naturally inhabits, such as Brazil, Columbia and Peru for example, would facilitate the development of the breeding, management and conservation of Arapaima. A Trans-Amazonian program could be established with the assistance of UNCTAD and its BioTrade Initiative.
Annex I

Literature cited:

For further reading:
Annex II: Important documents

- Peruvian ruling on Arapaima hunting.

ORDENACIÓN PESQUERA DE PAICHE

Decreto Ley N°25977, Ley General de Pesca

Reglamento de la Ley General de Pesca, aprobado por Decreto Supremo N°012-2001-PE

Resolución Ministerial N°147-2001-PE del 30 de abril de 2001
Aprueba el Reglamento de Ordenamiento Pesquero de la Amazonia Peruana.
Precisa para el paiche:
- Tamaño mínimo de malla: 8 pulgadas
- Talla Mínima de paiche: 160 cm. de longitud total
- Prohíbe la extracción y comercialización con fines ornamentales de los alevinos y juveniles de paiche provenientes del medio natural.

Resolución Ministerial N°215-2001-PE del 26 de junio de 2001
Temporada de pesca: entre los meses de marzo a setiembre de cada año en todos los ambientes acuáticos nacionales, a excepción de la cuenca hidrográfica del río Putumayo.
Queda prohibida la extracción, retención, procesamiento, transporte, comercialización o uso del recurso entre el 1° de octubre de cada año y el 28 de febrero del siguiente año.

Resolución Directorial N°747-2004-GRL/DIREPRO del 19 de julio de 2004
Aprueba el Plan de Manejo de Arapaima gigas “paiche” en la cuenca El Dorado, cuenca de Yanayacu Pucata – Reserva Nacional de Pacaya Sermiria, en la jurisdicción de la localidad de Marcos Capac, distrito de Pucallpa, Provincia de Requena en el Departamento de Loreto, siendo la entidad ejecutora la Organización Social de Pescadores y Procesadores Artesanales, Unidad de Pesca Comunitaria UPC Yacu Talla.

Junio 2005.
DNEPP/MAPH
Bundesamt für Veterinärwesen
Office vétérinaire fédéral
Ufficio federale di veterinaria
Uffizi federali veterinari

CH-3003 Bern
Schwarzenburgstr. 161
Telefon 031 323 85 24 / 09
Telefax 031 323 85 22

3003 Bern, 09.08.2005
EFL250.26

Importateur

Mueller Olivier
le Pâquier
1373 Chavornay

Autorisation No 3411/05

Importation - animaux protégés

1. Désignation des animaux/de la marchandise
poissons - animaux vivants
45 pc. poissons (Arapaima gigas)

2. Pays de provenance / Pays d'origine
PE (Peru)

3. Fournisseur
Pacific Interproducts SAC, Calle 6, mz. C. lt.10, PE-Lima

4. Bureaux de douane
Genève-Aéroport

5. Lieu de destination
Mueller Olivier, le Pâquier, 1373 Chavornay

6. Vétérinaire de contrôle
---

7. Indications des bases légales / Prescriptions de police des épidiozes / Observations
Visite vétérinaire de frontière au bureau de douane pendant les heures ordinaires de visite

Cette autorisation n'est valable que si les conditions de transport sont conformes aux IATA Live Animals Regulations

7a. Dispositions sur la conservation des espèces
Annexe II: Avec un permis d'exportation/certificat de réexportation CITES du pays d'origine/provenance.

8. Destinataire
Serv. vét. de frontière
Service vétérinaire cantonal VD
Importateur

08.11.2005

9. Taxes (seront perçues par la douane)
Taxe de chancellerie fr. 15.-
Taxe vétérinaire s. tarif

10. Valable jusqu'au

11. Signature - Office vétérinaire fédéral

**Sont réservées les décisions par lesquelles l'autorisation peut être revoquée ou modifiée en tout temps. L'autorisation n'est valable que pour l'importateur au nom duquel elle a été délivrée. Voies de droit voir au verso.**

Dr. Mathias Lütscher

SVET 3411/05 EFL250.26
- Example of certificate attesting to the farmed origin of Arapaima produced in Peru.

DIRECCION REGIONAL DE LA PRODUCCION - LORETO

CERTIFICADO DE PROCEDENCIA DE ESPECIES EN SUS DIFERENTES ESTADIOS, PROVENIENTES DE LA ACUICULTURA Y CENTROS PRODUCTORES DE SEMILLA

Ley Nº 27480
Decreto Supremo Nº000-2001-PE
Decreto Supremo Nº 035-2003-PRODUCE –TUPE
Resolución Ministerial Nº 225-2004-PRODUCE,
Servicio 12 que presta el Ministerio de la Producción

El Director Regional de la Producción – Loreto que suscribe, CERTIFICA:
Que, el lote de 45 alevinos de Paiche Arapaima gigas, que la empresa PACIFIC INTERPRODUCTS S.A.C., transportara a GINEBRA – SUIZA, consignados al señor OLIVIER MUELLER; corresponden al stock de alevinos que con fecha 07 de Abril del 2005, la Empresa Selva Amazon Breeder S.A.C, levantó, según Acta de Inspección y Verificación de levante de alevinos de Paiche Arapaima gigas Nº 002-2005-GRL-DIREPRO /DAMA; la empresa en mención dispone de la Autorización, según Resolución Directoral Nº 192-2005-GRL /DIREPRO, de fecha 7 de Junio del 2005; para desarrollar la actividad acuícola.

Que, el Ministerio de la Producción, otorgo Permiso / Certificado CITES Nº 031 para Exportación y mediante el escrito de fecha 15 de Agosto del 2005, la empresa “PACIFIC INTERPRODUCTS S.A.C.”, solicita Certificado de Procedencia a la Dirección Regional de la Producción.

Que, mediante Nota Nº 039-2005-GRL /DIREPRO-DAMA-fpc, de fecha 15-08-2005, el Sr. Fernando Poma Castillo, pone de conocimiento de la Dirección de Acuicultura y Medio Ambiente, que en la inspección realizada al lote de alevines de paiche, se llegó a determinar las siguientes características:

<table>
<thead>
<tr>
<th>Especie</th>
<th>Talla (cm)</th>
<th>Peso (gr)</th>
<th>Cantidad / caja</th>
<th>Total de cajas</th>
<th>Total</th>
<th>Precio Unitario $USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paiche</td>
<td>22 a 26.5</td>
<td>79.6 – 137.0</td>
<td>11</td>
<td>03</td>
<td>33</td>
<td>12.50</td>
</tr>
<tr>
<td>Paiche</td>
<td>22 a 26.5</td>
<td>79.6 – 137.0</td>
<td>12</td>
<td>01</td>
<td>12</td>
<td>12.50</td>
</tr>
<tr>
<td>TOTAL</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>04</td>
<td>45</td>
<td>--</td>
</tr>
</tbody>
</table>

Estos especímenes, serán transportados vía aérea por AEROCONDOR, el día 16 de Agosto del presente año, a las 07.00 horas.

Cualquier modificación al presente documento invalida su valor automáticamente, la validez del presente Certificado es de 10 (diez) días calendarios, contados a partir de la fecha de su emisión.

Iquitos, 15 AGO. 2005

MINISTERIO DE LA PRODUCCION
GR-LORETO
HABILITADO

D.P. 05-408/2005
Example of CITES authorisation given by the Peruvian government.
**Description de l’espèce** / **Beschreibung der Tierart**

**Nom latin / wissenschaftlicher Name:** Arapaima Gigas

**Famille / Familie:** Osteoglossidae

**Nom commun / gemeinsamer Name:** Paiche (Perou) / Pirarucu (Brésil)

**Habitat / Lebensraum:** Amazonie / Amazonien

Le Paiche est un considéré comme le plus grand poisson d’eau douce du Monde. Ce poisson peut atteindre une taille de plus de 200 kg. Sa population en Amazonie (Perou, Brésil, Colombie) est en regression et a été depuis 1975 introduit dans l’appendice II du CITES, son exploitation est donc strictement contrôlée. Au Pérou sa capture est autorisée à partir d’une taille de 1,6 m et seulement de mars à septembre hors de la période reproduction. Les poissons issus d’élevage ne sont pas soumis à restriction.

**Description du produit** / **Beschreibung des Produktes**

**Apparence de la chair:** légèrement rose, blanche après cuisson

**Anschein des Fleisches:** leicht rosa weiss nach Kochen

**Texture:** ferme et stable à la cuisson

**Konsistenz:** fest und stabil nach Kochen

**Goût:** léger et délicat

**Geschmack:** leicht und delikat

**Produit apparenté:** Perche du Nile (Lates niloticus)

**Verwandtes Produkt:** Nile Barsch (Lates niloticus)

**Composition chimique** / **Chemische Zusammensetzung**

**Protéine / Protein** 21%

**Graisse / Fett** 5 %

**Humidité / Feuchtigkeit** 72 %

**Conditionnement du produit** / **Aufmachung des Produktes:**

Frais ou congelé IQF: portions de 300 à 500 g sans arête, sans peau

Frisch oder tiefgekühlt IQF: Portionen von 300 bis 500 g ohne Graete, ohne Haut

Filets de 2 à 3 kg (taux de filetage 57-60%)

Filet von 2 bis 3 kg

Poisson entier eviscéré 10 à 15 kg

ausgenommener ganzer Fish 10 bis 15 kg

Bon produit pour fumaison à chaud et à froid / Gutes Produkt für heisses und kaltes Räuchern
ARAPAIMA GIGAS
THE WORLD LARGEST FRESHWATER FISH FROM THE
AMAZON BASIN

Paiche élevé à Tarapoto /Perou
Paiche gezüchtet in Tarapoto / Peru

Filet de Paiche, un très beau produit permettant toutes les préparations
Paiche filet ist ein sehr schönes Produkt, dass alle Varianten der Zubereitung erlaubt
Market study Arapaima gigas
on the behalf of UNCTAD       Palais des Nations 1211 Geneva 10 Switzerland

Contact person:

Phone: ____________________________

e-mail: ____________________________

website: ____________________________

Product questionnaire

Would you be interested in this product?:
Wild Arapaima  yes  no
Farmed Arapaima yes  no

Reason (s)

Which kind of product would be interested in ?

Whole fish  yes  no
fresh  yes  no
frozen  yes  no
weight / size____________________________________

Filet  yes  no
fresh  yes  no
frozen  yes  no
smoked  yes  no
whole  yes  no
portions (gr)____________________________________

Which price would be it acceptable for this product / kg ? ____________________________

Which quantity per annum could you buy and for which product ?

____________________________________

An organic certification would be interesting?

yes  no

Would you agree to pay a premium for a certified product?

yes  no

Many thanks for your help

Please send this form back using the stamped envelope
Annex III: Resources and addresses

1. CITES

website: www.cites.org

representatives:

Peru:

Management Authority / Autoridad Administrativa / Organe de gestion

Instituto Nacional de Recursos Naturales (INRENA)
Calle Dieciséis N° 355 (Los Petirrojos)
Urbanización El Palomar
San Isidro - Apartado Postal 4452
LIMA 27

Tel: +51 (1) 224 32 98; 225 98 09
Fax: +51 (1) 224 32 18; 225 98 09
Email: Leoncio Alvarez Vasquez, Jefe:
lalvarez@inrena.gob.pe
Ing. Antonio Morizaki Taura, Intendente Forestal y de Fauna Silvestre:
amorizaki@inrena.gob.pe; forestal@inrena.gob.pe
Blga. Rosario Acero Villanes, Directora de Conservación de la Biodiversidad:
racero@inrena.gob.pe

Ministerio de la Producción / Vice Ministerio de Pesquería
Calle Uno Oeste N° 050
Urbanización Corpac
San Isidro
LIMA 27

For species from aquaculture /
Para especies provenientes de la acuicultura /
Pour les espèces provenant d’aquaculture

Dirección Nacional de Acuicultura
Tel: +51 (1) 224 32 47
Fax: +51 (1) 224 32 47
Email: dna@produce.gob.pe

For species from natural environment /
Para especies provenientes del medio natural /
Pour les espèces provenant du milieu naturel

Dirección Nacional de Extracción y Procesamiento Pesquero
Tel: +51 (1) 616 22 22
Fax: +51 (1) 616 22 22
Email: dnepp@produce.gob.pe
France:

Management Authorities / Autoridades Administrativas / Organes de gestion

Ministère de l'écologie et du développement durable
Direction de la nature et des paysages
Bureau des échanges internationaux d’espèces menacées
20, avenue de Séguar
F-75302 PARIS 07 SP
Tel: +33 (1) 42 19 19 03
Fax: +33 (1) 42 19 19 81
Email: sylvie.guillaume@ecologie.gouv.fr (chef du bureau)
stephanie.jacquet@ecologie.gouv.fr (adjointe)

United Kingdom:

Management Authority / Autoridad Administrativa / Organe de gestion

Department for Environment, Food and Rural Affairs (Defra)
Global Wildlife Division
1st Floor, Temple Quay House
2 The Square
Temple Quay
BRISTOL BS1 6EB
Tel: +44 (117) 372 80 17
Fax: +44 (117) 372 82 06
Email: cites.ukma@defra.gsi.gov.uk
Web: http://www.ukcites.gov.uk

Switzerland:

Management Authority / Autoridad Administrativa / Organe de gestion

Office vétérinaire fédéral
Liebefeld-Bern
Schwarzenburgstr. 155
CH-3003 BERN
Tel: For fauna / Para fauna / Pour la faune:
+41 (31) 323 81 59; 323 82 24
For Flora / Para Flora / Pour la flore:
+41 (31) 323 83 99
Fax: General / Général:
+41 (31) 323 56 86

Permit office for fauna and flora / Oficina de permisos para fauna y flora / Bureau des permis pour la faune et la flore:
+41 (31) 323 85 22

Email:
For Fauna / Para Fauna / Pour la faune:
– mathias.loertscher@bvet.admin.ch
– bruno.mainini@bvet.admin.ch
– thomas.althaus@bvet.admin.ch
For Flora / Para Flora / Pour la flore:
– jonas.luethy@bvet.admin.ch

Web: http://www.cites.ch
2. Information on markets, statistics and formalities

European Union:


Switzerland:

Data base is not free of access and a demand must be applied to the authorities.


Taxes and duties: http://www.tares.ch

3. Information on labels and certification

Organic certification:

Naturland http://www.naturland.de
BioSuisse http://www.biosuisse.ch
AB http://www.agriculture.gouv.fr/spip/ressourcesThemes.alsimentationconsommation.qualitedesproduits.signequalityetdorigine.agriculturebiologique_r176.htm
Soil Association http://www.soilassociation.org

Fair Trade:

Max Havelaar www.maxhavelaar.ch
FLO http://www.fairtrade.net
Transfair http://www.transfairusa.org
World shops http://www.worldshops.org

Eco-friendly label

Marine Stewardship Council http://www.msc.org/

Supermarket chains labels

COOP http://naturaplan.coop.ch/default_de.html?&language=DE
Migros http://www.engagement.ch
Carrefour http://www.carrefour.fr/ccm/content/categories/a-propos-de-carrefour/fqc.jsp
If you represent a community, company or a non-governmental organisation that requires assistance in developing your own BioTrade project, please contact:

United Nations Conference on Trade and Development
BioTrade Initiative – BTFP
Palais des Nations
CH-1211 Geneva 10
Switzerland

Tel: +41 22 917 2052
Fax: +41 22 917 0044
Email: biotrade@unctad.org
Website: www.biotrade.org

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