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Assignment #1

Aquaculture Development

In the last fifteen years, the practice of aquaculture has seen a great expansion due to an increase in demand and advances in technology. It has been the fastest growing food-producing sector of the last decade.
The following graphs illustrate the development of this practice in terms of total quantity produced (Figure 1) and total generated value (Figure 2).

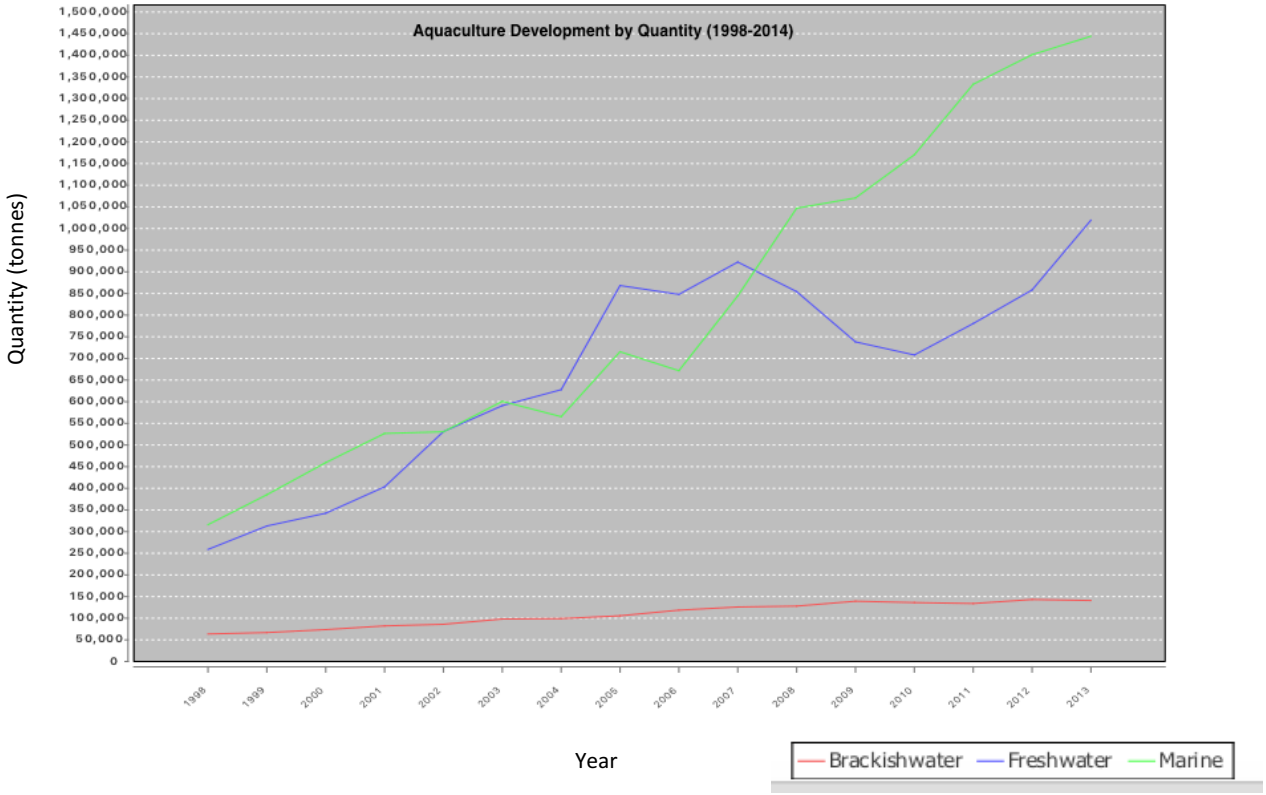


Figure 1: Development of Aquaculture by Quantity. Source: FAO Aquaculture Production, March 2015

The graph above shows that the highest development in terms of quantity has happened in marine environments. This is probably due to the growth of intensive farming of carnivorous species such as Atlantic salmon, trouts or groupers, which are farmed in Marine ecosystems. (FAO 2014)
Freshwater development has also been significantly high, even surpassing marine ecosystems from 2003-2008, although it saw a drastic drop in 2008. Figure 1.1 shows the important role that developing countries have played in the growth of freshwater aquaculture. This can be attributed to the fact that it is a

practice easier to achieve than mariculture (FAO 2014), meaning that developing countries can easily set up a practice that results in high income returns.
Figure 1.1 also depicts that the drop in production from 2008 to 2010 comes directly from developing countries. We can infer that this took place due to a dramatic decrease in the demand of imported fish products from developed countries associated with the recession following the 2008 financial crisis.

Figure 1.1: Freshwater Aquaculture Development by Economic Group. *Source: FAO Aquaculture Production, March 2015*

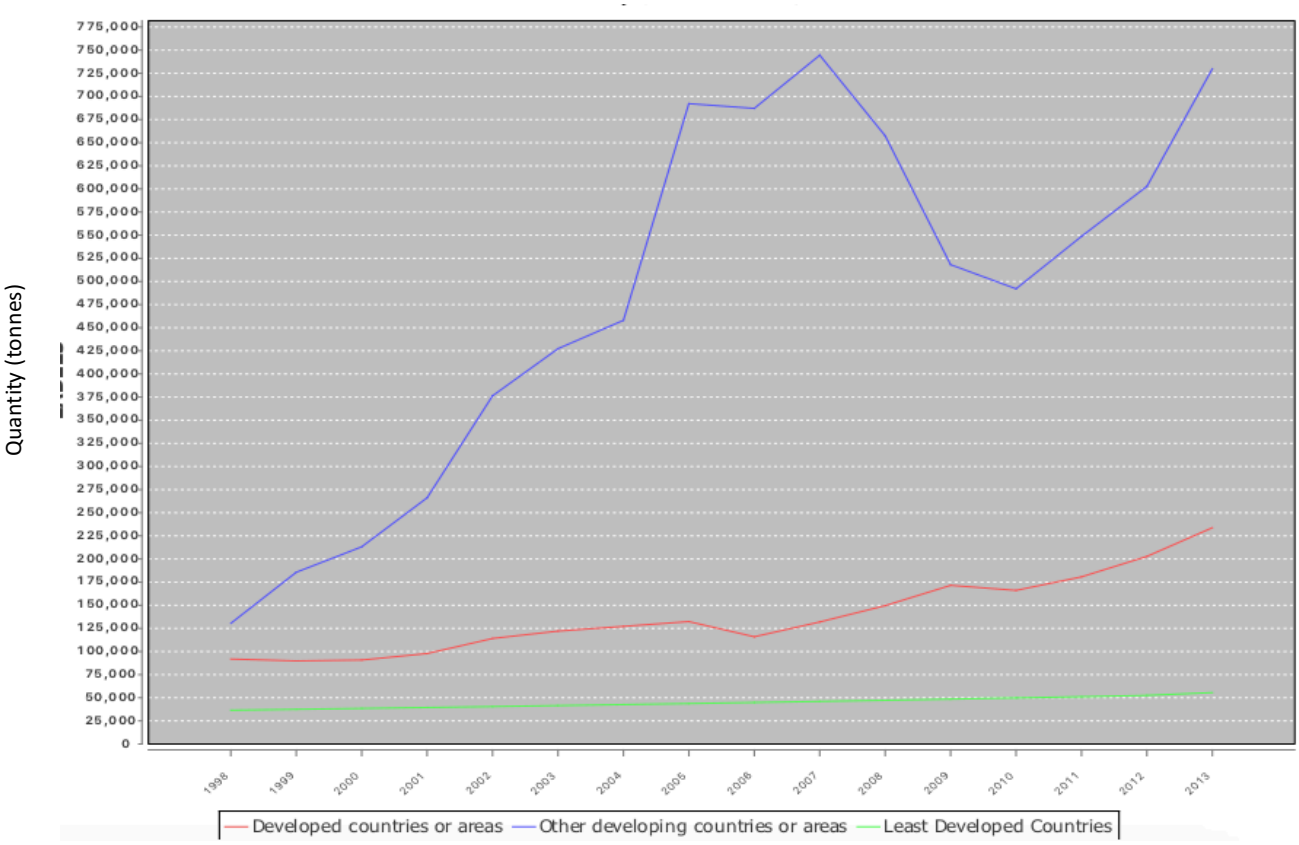


Figure 1 also shows that brackishwater production is significantly lower than in other environments, possibly due to the wide fluctuations of tide and salinity that occur in coastal areas (Karim). However, its growth has also been significant (50,000 tonnes in 1998 to 150,000 tonnes in 2013), which can be greatly attributed to the high economic value of the farmed species, as we can see from the following graph.

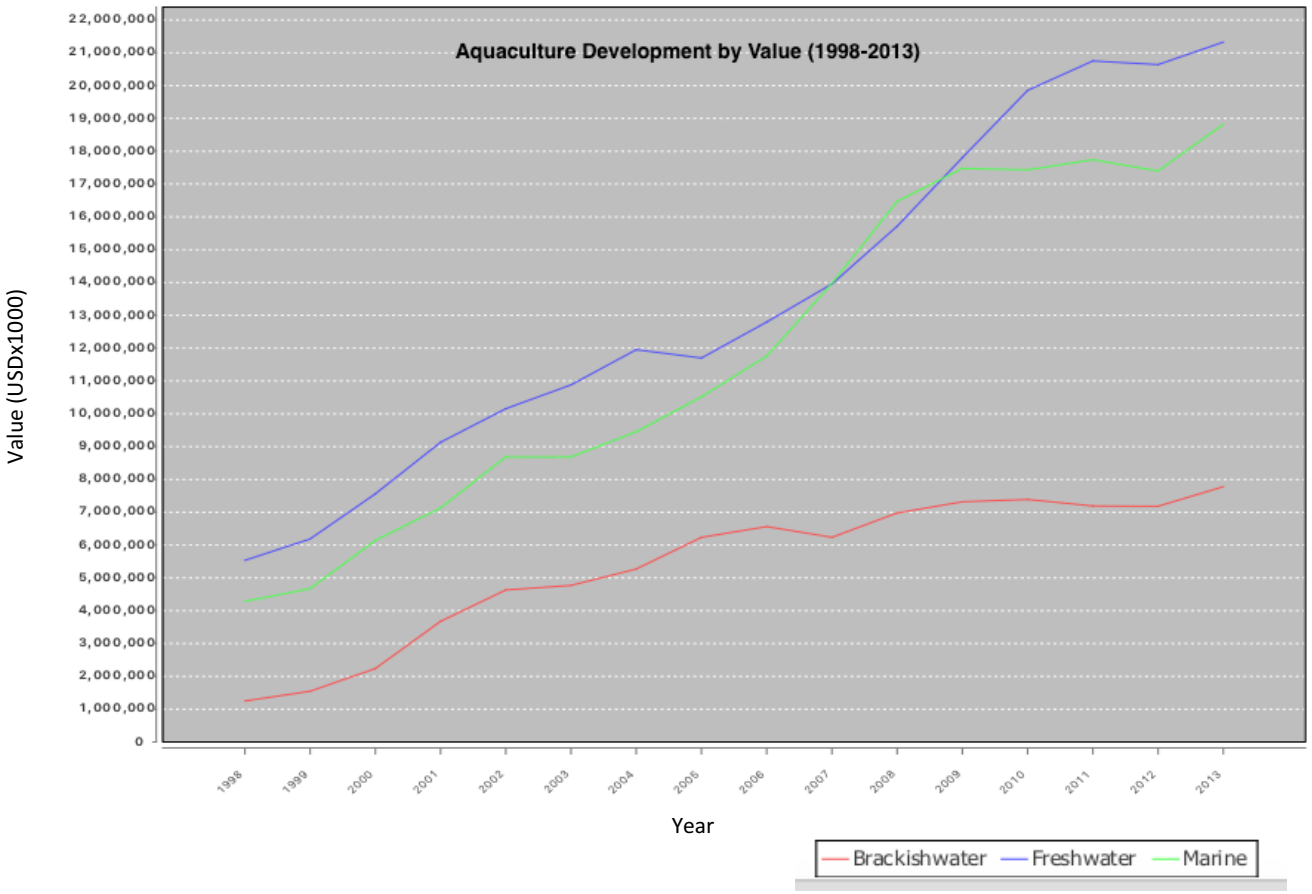


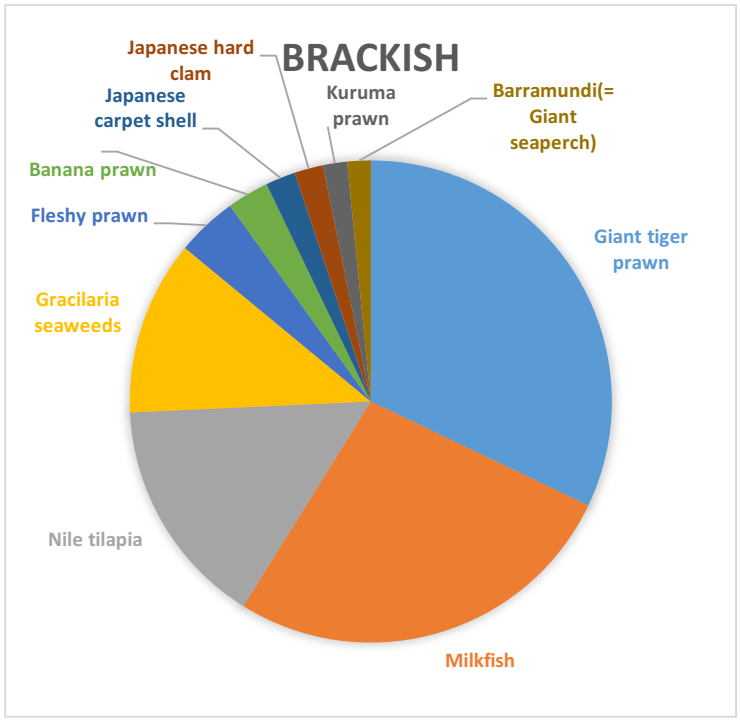
***Figure 2: Development of Aquaculture by Value**. Source: FAO Aquaculture Production, March 2015*

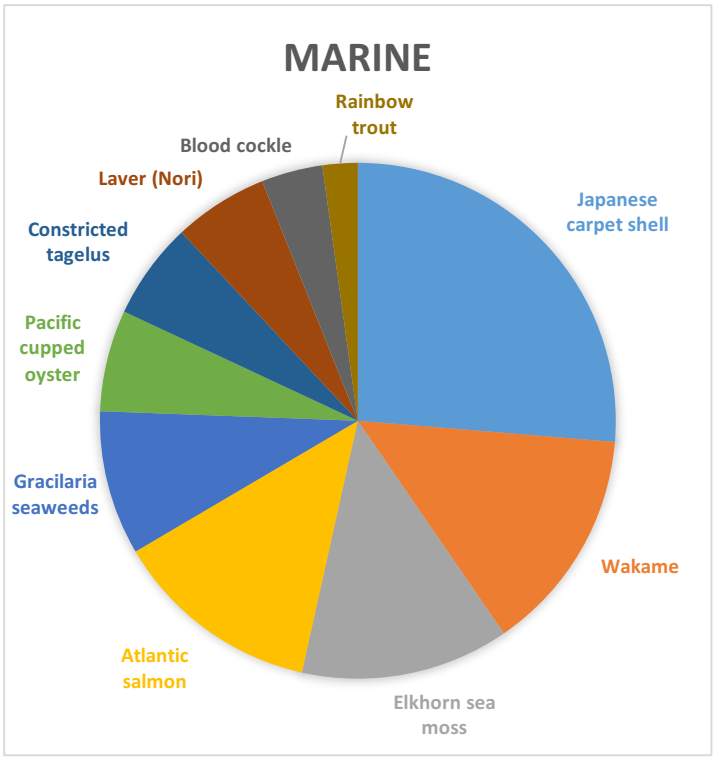
As with quantity produced (Figure 1), it is clear that brackishwater environments have a much lower level of value generated compared to that of freshwater and marine environments. However, the value of brackishwater products has increased significantly faster than its quantity. By 2013, the difference in value between brackishwater and the other environments is smaller than that of its quantity. Therefore, it can be inferred that there is an important economic value in brackishwater environments.

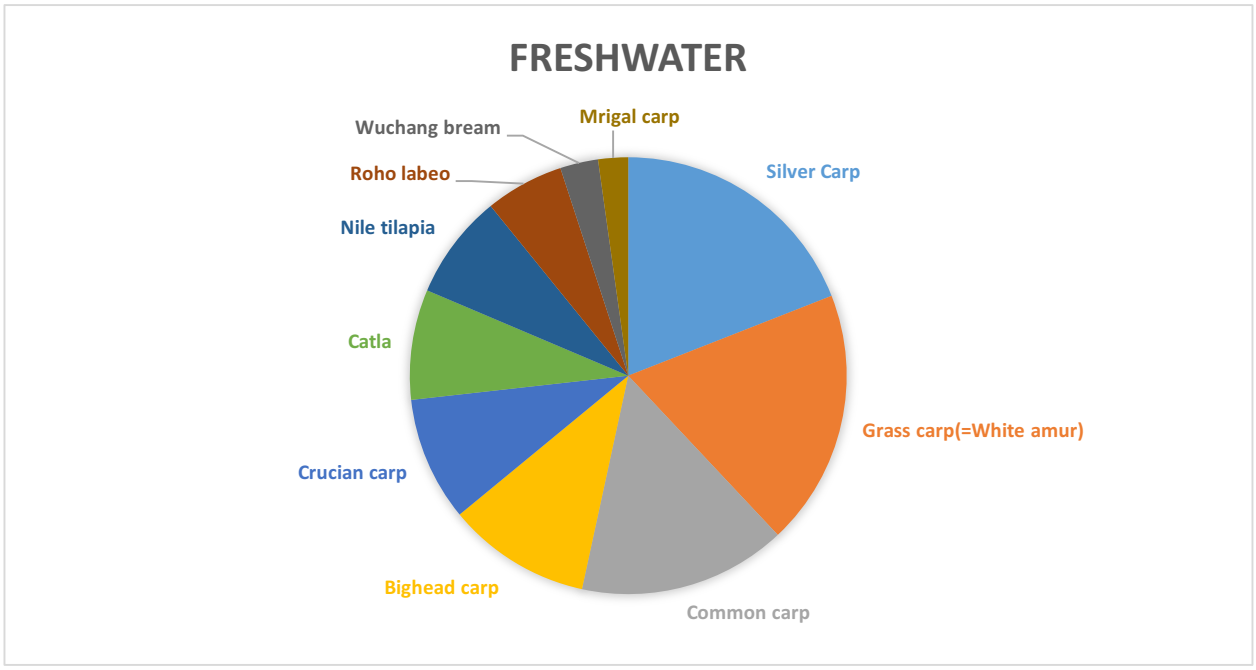
The Economic Importance of Brackishwater Environments

To explain the inference made in the previous section, we can compare the main species produced in the different environments (Figure 3).

***Figure 3: Top 10 species by Quantity**. Source: FAO Aquaculture Production, March 2015*







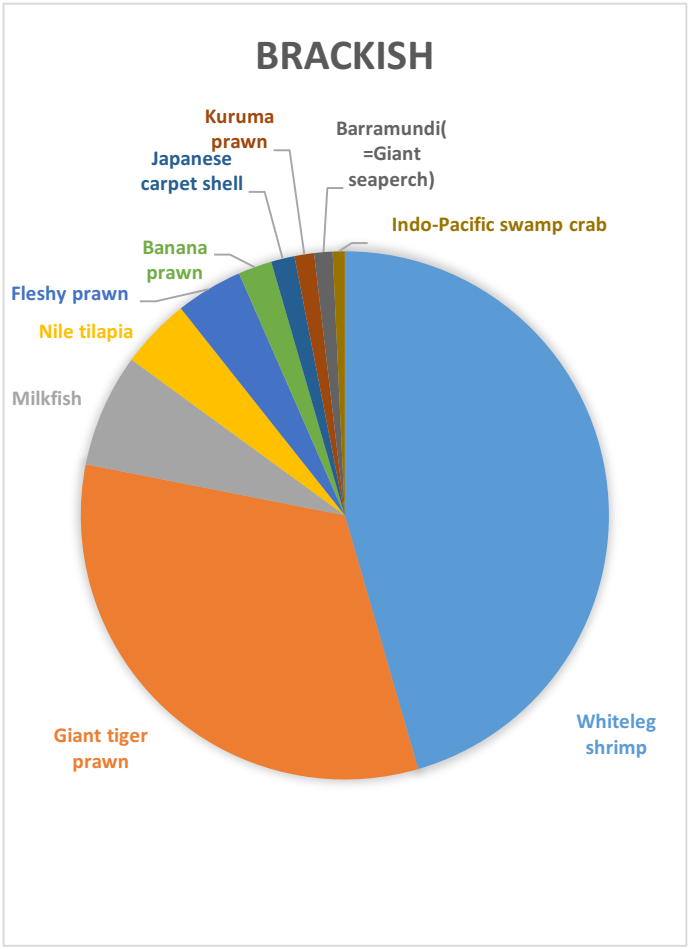
By comparing Figure 3 with the highest-valued species in aquaculture (Figure 4), it is clear that the species produced in greatest quantities in brackish waters have a high value associated with them.

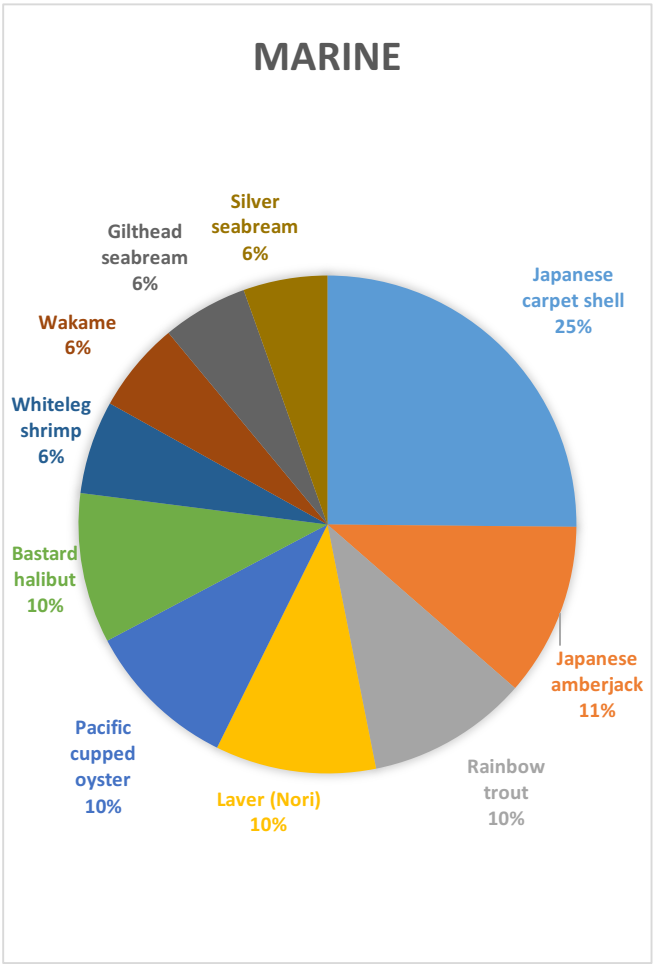
Common name	Latin name	Value
		(billion US$)
Whiteleg shrimp	Penaeus vannamei	3.84
Pacific cupped oyster	Crassostrea gigas	3.69
Giant tiger prawn	Penaeus monodon	3.43
Atlantic salmon	Salmo salar	3.41
Silver carp	Hypophthalmichthys molitrix	3.20
Japanese carpet shell	Ruditapes philippinarum	3.13
Common carp	Cyprinus carpio	3.01
Grass carp(=White amur)	Ctenopharyngodon idellus	2.99
Japanese kelp	Laminaria japonica	2.81
Chinese river crab	Eriocheir sinensis	1.84

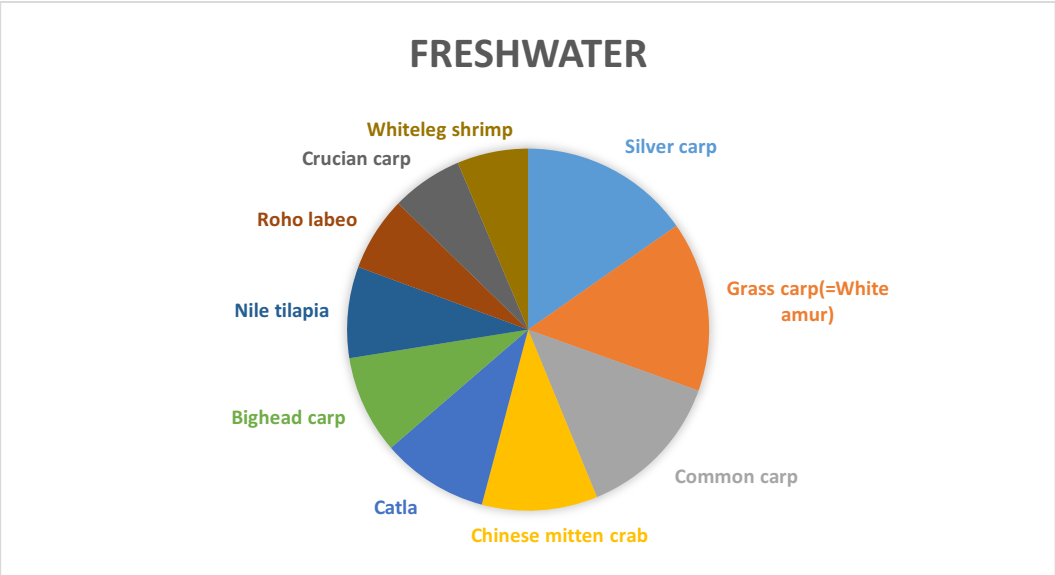
***Figure 4**: Top 10 Highest-Valued Species. Source: Lecture Notes.*

This is confirmed by looking at the top ten value-generating species in each environment, as is shown in Figure 5.

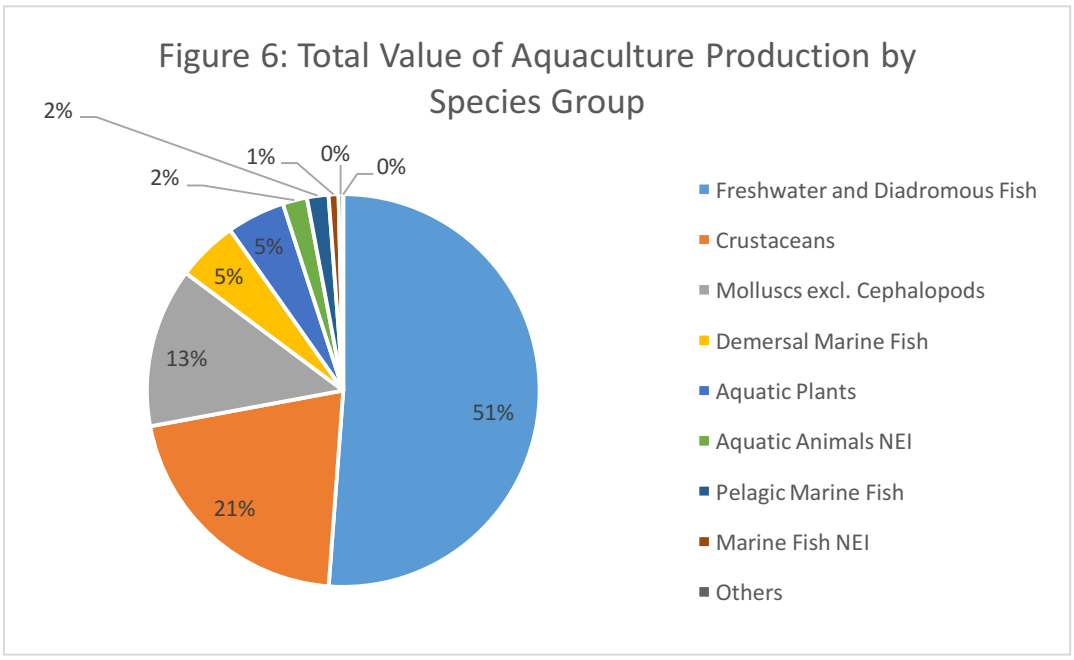
***Figure 5: Top 10 species by Value**. Source: FAO Aquaculture Production, March 2015*



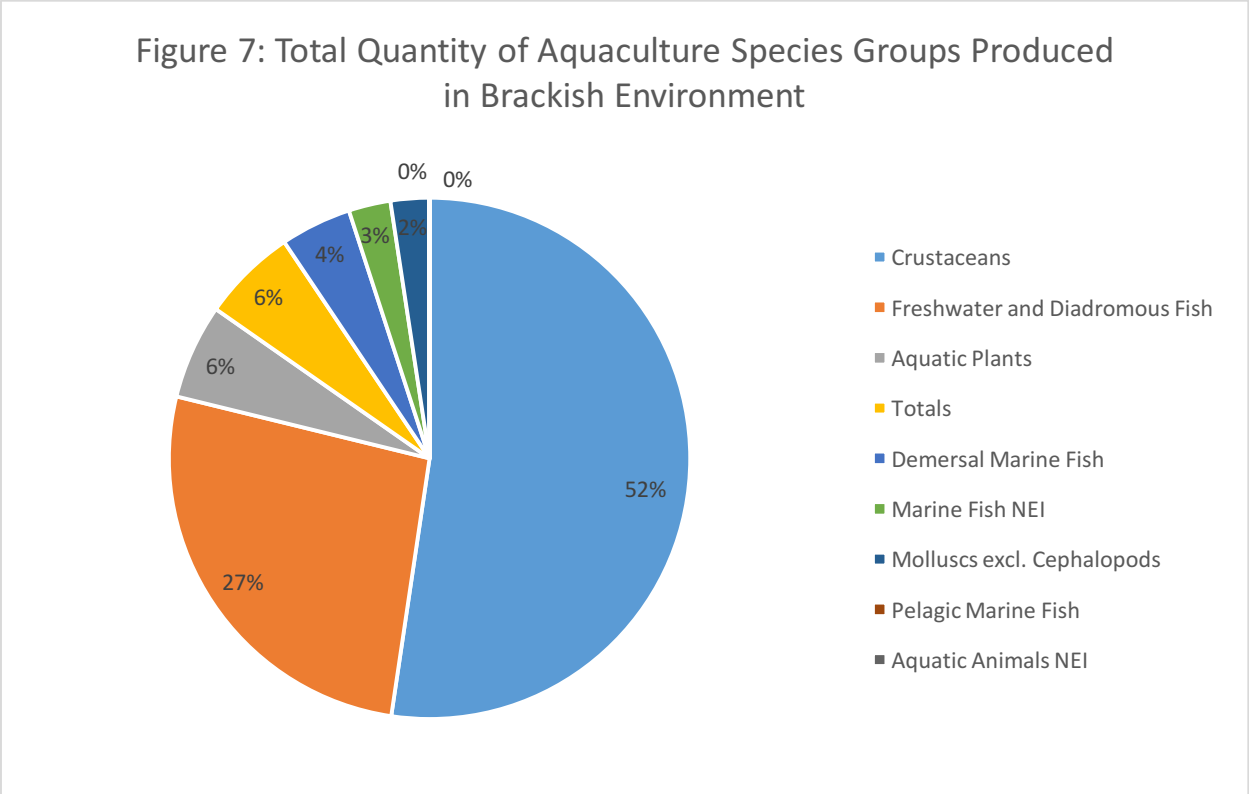




Whereas the value of freshwater and marine environment production is more widely divided among different species, the whiteleg shrimp and the giant tiger prawn (ranked #1 and #3 in Figure 4) account for the highest value in brackish environments. The ability of this environment to produce highly-valued species accounts for its huge economic potential. The next two graphs explore this further.



Source: FAO Aquaculture Production, March 2015



Source: FAO Aquaculture Production, March 2015

Figure 6 shows that 72% of the value generated by aquaculture production in all environments comes from crustaceans and freshwater/diadromous fish. On the other hand, Figure 7 shows that these two species comprise 79% of the total production of brackish environments. It is, then, evident, that this environment is of huge economic importance.

Conclusion

Aquaculture has greatly expanded in the last fifteen years, creating opportunities for developing countries and increasing the availability of fish products. Freshwater and marine environments have contributed the highest share to the total revenues and harvests, but brackish water environments have proved of significant economic importance due to their potential to produce highly-valued species.

References

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