Transparent channels of market information need to be established, illustrated by the success of many countries in Africa exporting agricultural products to EU markets.

On the demand side, it seems that retailers expressed a great interest in GLOBALG.A.P.-certified shrimps during the recent GLOBALG.A.P. Summit in Cologne. This is like long awaited raindrops during a drought. It also holds true especially when knowing that some big Japanese retailers are considering using GLOBALG.A.P. standards as a purchasing requirement. Last but not least, the Department of Fisheries (DoF) has worked hard over the last years in developing and enforcing Thai GAP/CoC for shrimp farming. Considerations to have Thai CoC and GLOBALG.A.P. benchmarked will certainly contribute significantly to achieving the target of increasing market share of Thai shrimp export in EU markets.

Concluding remarks and way forward

The introduction of a GLOBALG.A.P. standard in shrimp aquaculture, in addition to many others, emphasises the growing trend in market requirements in terms of sustainability. To enhance market opportunities in EU, it seems possible for Thai farms to join the GLOBALG.A.P. standard by improving farm management systems, including record keeping. The ease of understanding the GLOBALG.A.P. standard (i.e. a guidebook of standard interpretation) and guidance on implementation (i.e. user manual) as well as the compromising of orders and prices are most critical to promote the standard adaptation. Buyers (i.e. retailers) are seen as the most powerful players along the whole supply chain, and thus the requirement of GLOBALG.A.P. standard in their purchasing specification will be the driving force of GLOBALG.A.P. standard application. At the same time, it is essential to convey the message through certified products to end consumers who will hopefully take that into account when purchasing shrimp.

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The Victorian trout industry & the bushfires

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With seemingly endless floods in Queensland and "end of the world" firestorms in Victoria destroying homes, infrastructure and jobs estimated at more than a billion dollars, climate change has taken on a startling new meaning. It must be becoming frighteningly obvious to even the least environmentally aware in the community that we are going to have to change the way we go about our daily lives and produce our food.

The Australian aquaculture industry recently experienced a worst case scenario of just how devastating the changes to the climatic patterns can be.

The Sydney rock oyster is world famous for its succulent sweetness. It is the oldest aquaculture sector in Australia and operates in the estuaries along the New South Wales (NSW) coast. It is a major employer and brings $35 million a year to rural NSW.

In mid February some parts of the coast received half their annual rainfall over seven days with a mid event peak of 150 mm in 24 hours. The rivers rose steadily. When the peak rainfall hit the rivers broke their banks and brought down huge volumes of swirling brown floodwater carrying trees and branches that swept everything before them.

The full extent of the damage won't be able to be fully assessed until late autumn. The cyclone season has been running later than normal over the last few years and their impact has been more extreme. Although NSW is south of the storm zone, the rainfall events that follow the cyclones have been severely flooding the coastal reaches.

Trouble on the way. All photos courtesy of Mark Fox, Yarra Valley Salmon.

NSW Farmers' Association Oyster Committee Chair Mark Bulley said it was too early to tell the extent of the damage to the industry at this stage. "Some oyster farms have been under freshwater for seven to ten days. We had a neap tide so there was not a lot of seawater pushing up into the estuaries. The oysters won't feed in freshwater so they can get stressed. Once the spring tides come back and the rivers return to normal we'll get an idea of where we stand. It's only by going over the farms after we're back to full saline conditions that we will know the full extent of the damage".

Infrastructure damage was varied. Mark said a lot depended on the amount of debris that came down with the floodwaters. "In some cases oyster rafts were broken away from their moorings by the build up of logs and debris".

The NSW Farmers' Association has called a meeting of industry representatives and invited a range of government authorities to see what can be done for the industry in the most affected areas. Mark said "we prepare as much as possible for the worst case scenario and then you hope for the best. These are the rules when it comes to working with nature".

Oysters farms south of Sydney missed the rain event and were able to remain open. The worst areas hit were on The Mid North Coast from the Hastings River north to the Nambucca River.

While the NSW coast was being inundated, Victoria was suffering from the reverse effects of climate change. Rainfall in the southern parts of Australia has been well below average. Over the last 12 years Victoria has received 20% less rainfall than normal and the government is busy building a desalination plant to keep the capital of 3.5 million people supplied with potable water.

This situation has worsened the bushfire threat to a region that is already prone to destruction from uncontrollable outbreaks of wildfire.

The bushfires that ravaged Victoria recently have placed enormous pressure on the rainbow trout sector, which has been the backbone of the Victorian aquaculture industry since its establishment in the late 1970's. Trout farmers have continuously produced more than half the value of the aquaculture industry in that state and the growers there have stayed abreast of global industry trends.

Situated in the upper valleys of the Great Dividing Range, the industry is based on stream diversion from the Goulburn River and its tributaries. The fires have burnt out at least four of the 10 farms in the area and the others are faced with diminished water quality.

The fires severely impacted on water quality in the catchment, resulting in heavy losses in downstream farms.

The industry employs 200 people in a semi remote region and supplies Melbourne and Sydney with fresh rainbow trout at very affordable prices. Production is just under 1,700 t/ per year worth over $12 million. It has been a model aquaculture industry with an unblemished environmental record.

The south east of Australia is, along with Southern France and California, one of the world's most bushfire prone regions. The debate on global warming and its influence on climate change is polarising communities everywhere. Climate change or no climate change, the facts are that rainfall in Victoria has been below average now for 12 consecutive years and heat waves have become not only more frequent, but also lasting longer and are more extreme.

When in late January temperatures peaked at 45°C and remained over 40°C for four days the state shrivelled. Ten days later the temperature again soared, to 46°C. At the same time a north westerly wind developed with gusts up to 100 kph. It only took one spark and the whole state went up in flames. (Sadly, some of the fires were deliberately lit). Embers were carried by wind miles ahead of the main front and cut off escape roads. In the late afternoon the wind swung around to the southwest and the fire storm changed direction. Over 200 people died and whole towns were wiped out in the inferno.

The trout industry was in the midst of the firestorm. In the shock of the aftermath it is not clear when the farms that were destroyed will be able to rebuild. The industry relies on the clear mountain streams for its water source. The catchments for these streams are now just beds of ash and carrion. Fire retardant chemicals are used in Australia and the extent of their impact is another unknown the industry will have to deal with.

Government and industry are preparing to meet to determine what can be done to get the industry back on its feet. Fisheries Victoria's Aquaculture and Inland Fisheries Manager, Anthony Forster, said the Department of Primary Industries (DPI) was monitoring the effect of the fires on a number of fish farms.

"While the full extent of the impact is not yet known, it is clear a number of fish farms were located in fire affected areas where significant infrastructure and stock loss occurred.

DPI is working with the Victorian Trout Association to identify the extent of the impact, understand the key issues facing industry and how it may be able to assist with recovery".

While the task ahead is indeed daunting, the trout industry is rallying. The Meggitt family has been farming at Goulburn Valley Trout since 1989. Edward Meggitt said, "The trout industry does anticipate supply problems going forward. We

hope to meet as an industry when the immediate threat has passed to evaluate exactly where we stand and what is the most appropriate course of action.

"We do hope that our customer base, suppliers and government stand by our industry and support us through this trying time".

Aquaculture, being more environmentally sensitive than most food sectors, is more vulnerable to climate change than say the pig and poultry sectors. Meeting that challenge is going to place a huge strain on existing aquaculture industries. From the above it can be seen just how devastating climate change can be. It may turn out to be that Australia is the guinea pig in this instance.

However, there is no escaping the fact that the weather is becoming more extreme and more unpredictable. Singapore based Jim Rogers, founder of the Rogers International Commodity Index in a recent interview with George Negus of SBS's Dateline said that the best thing to be in at the moment was farming. Let's hope he's right.

Postscript: At the time of going to press the Queensland coast from Cairns to Maryborough was being lashed by Category 5 cyclone Hamish. This monster storm is 400 km wide and with winds over 200 kph and inundating rainfall,

the prawn and barramundi aquacultures in the region face devastation at worst, long interruptions to services and production at best.

Disposing of mortalities resulting from the fire.