

The Nuffield Global Focus Programme Tour (Africa, 2018)

March 19 – April 26 2018

Solis Norton

The Africa group, 2018

Through March and April of 2018 I partook in the Nuffield Global Focus Programme tour. With me were Turi McFarlane (New Zealand) and Shannon Notter, a kiwi living in Australia, from Australia Andrew Slade, James Hawkins, and Alison Larard, from Scotland Jenna Ross and from Nova Scotia in Canada Josh Olton.

Over the course of our travels we grew into a tight knit group, having never previously met before. There were many trials and tribulations overcome which gradually helped stick us together as a professional group. There were plenty of social events and hours travelling in close proximity too which stuck us together as friends. Regularly debriefing as a team on the countless discussions we had with hosts, guests, farmers and all the rest was a great help to me at least in forming my thoughts as we travelled.

While we did on occasion use some of the tools Nuffield suggested for managing the team, overwhelmingly it was the positive outlook and desire to make us work as a group that drove our transition from virtual strangers to a professionally effective team of close friends.

I would like to take this opportunity to thank them all for their time, thoughts, care, and for looking after me so well.



Africa GFP, 2019. From left: Solis Norton, Josh Olton, James Hawkins, Colm O'Leary, Dave our host, Michael Horsch, Turi McFarlane, Shannon Notter, Alison Larard, and Andrew Slade

Travel summary

Netherlands (CFC visits)		Key insight
World Hort Centre	Rob Baan	A remarkable approach to high tech having a research centre, promotion centre and training centre all in one location.
Dairy farm & ice cream producer	Ronald Pelgrom	Happy without growth, passionate and caring about his cows. Getting the margin he needs. Inspirational.
Oregon		
Wheat Marketing Centre	Janice Cooper	60 million metric tonnes to shift each year.
Oregon Dept of Ag	Alexa Taylor	Oregon has a great climate and environment for farming, busy spot.
George Packing Co. Hazelnuts	Larry George	Working hard, getting somewhere with a growing market and good opportunities and system.
Ricreall dairy	Louie	Working hard, getting nowhere, at least in the last five years.
Hatfield Marine Centre	Bob Cowan	Salmon and oyster management for climate change
Grassfed beef	Tim Miller	Not working too hard and still getting somewhere and happy besides
Tillamook Extension Service	Dave & Dave	Robots as the future of dairy, but hard to justify if profitability isn't there.
Washington DC		
Farm Bureau	Andrew Walmsley	Strengthen rural people and their communities – “farm income across commodities has fallen by around 50% in the last 4 years”
National Farmers Union	Matt Purdue	To organise farmer representation against large corporates. 5 year

		downward cycle. Mental health an important issue. 500 dairy farms closed in Wisconsin last year due to financial constraints.
Young Farmers discussion	Andrew Behrenburg	Less than 2% of people in the US are involved with agriculture. How do we get consumers to engage with this tiny minority?
Farm Credit	Gary Matteson	\$300 billion in assets for mortgages, loans, infrastructure. One in four farms has a young operator on-site, learning from older operator – the belief that farmers are an aging population is flawed.
Undersecretary Agriculture, USDA	Ted McKinney	Bullish in the extreme regarding the US. First comes better nutrition for the kids, then their education.
Women in agriculture, USDA	Lillia Mcfarland	Succession, women, and the challenge.
NZ embassy	Jason Frost	New Zealand's place in the web of global systems. Figures on trade and deficit are meaningless without context.
Farm Bill - SNAP (supplemental nutrition advance programme)		Total farm subsidies/yr ~\$200billion. Small fraction of total farm bill of which 75-80% is SNAP. Bill renewal September 2018. Estimated \$954 billion spend over 5 years.
Czech Republic		
Horsch	Michael Horsch	The way of the future and the vision to see it.
Ukraine		
Farm one	Kees Huizinga	Someone else who naturally understands energy return on investment
Farm two	Thomas and Mike	Exploiting opportunities
Kiev	Winter on fire	Political challenges

Sweere grains	David & Danny Sweere	30 years in the grain business from the end of the collective farm era. But economic hardship now and getting out. Incredible adventure
Water for vegetables	Willem and Kees	Exploiting opportunities as yet unrecognised by locals
Agricultural Lyceum	Hanna	Training facility for those interested in agriculture. What stage of development should it aim at?
Kenya		
School		Lovely spot, but no one is really into farming
Yoani farm	Robin Stanley	Combining Western and African systems. Focus where the money is with the kennels and dog freighting.
Kapiti farm (ILRI)	Annie Cook	Western support for developing solutions to animal health challenges in Africa and elsewhere
Ausquest farm	Stuart Barden	Show people the value in the land
Mogwooni farm	Jacky & Mandy Kenyon	Keep it simple and live the good life in the African outback.
Lake Naivasha		Family challenges in keeping it simple living the good life in the African outback by the lake.
Eburru farmer discussion group	Lydia Nyoto	The cell phone is not enough to kick start development.
Juice factory		An example of successful development
Johannesburg		
Kasima farm	Poe and Dire familys	The best of both worlds.
Monsanto Petit	Christian Troskie	Corn for the people, does it matter whether it's natural or not?
Industrial Development Corporation		Money for the people, does it matter whether it's natural or not?

Farmer field day, Limpopo	Hclami &	The tremendous appetite to learn
Agro Ecology	Arne Verhoef	Perpetual imminence
Teshwane market	Stryke	High throughput, mostly regional distribution
Capetown		
Abalimi small scale gardening in slums	Cristina Kaba	The power of one, or two or three, and their challenge
Vergenoegd vineyard & ducks		How can we beat everyone else
Bontebok ridge	Tom	The power of lateral thinking
Fynbloem	Bayers Bayers	Looking after people and looking to the future.
Fruitways	Chris Moodie	The joys of third generation business

Key insights:

The price of land

The high price of rural land ideal for food production in many countries is not a reflection of an inflated real estate market. It is a reflection of a deflated food price.

Price of farmland per hectare	Location
€ 64,000	Netherlands (top quality)
€ 40,000	Germany
€ 10,000	UK
€ 800 – 2,000	Ukraine
€ 21,000	Mogwooni, Kenya. Price five times higher in areas near roads
€ 16,000	Median price in New Zealand
€ 21,000	Median for Dairy land (NZ)

Abundant low priced food is essential for social stability and organised from the very highest levels. Thus it is thankfully a situation that is unlikely to change any time soon. I saw that subsidies to preserve it, in all their diverse forms, could well deserve more merit than the average kiwi farmer would give them.

The kiwi 'I can do it on my own, subsidy free' mentality ignores the many economic instruments, pressures, and arrangements occurring beyond the farm gate to produce. All of which can greatly influence the price. It is characteristic of a system in which producers can reliably make money on their product. But if we fast-forward 20 years to a New Zealand where farmers will face a substantial price on emissions, a cap on stocking density, and compulsory investment in water quality improvement external support will be essential to enable their continuity.

The disconnection between consumers and their food and food producers

There is an enormous gulf between the consumers and producers of food in the developed world. I saw it is brought about primarily by a mix of murky and inaccessible mechanisms and mega operators which manipulate the price and availability of food around the world for their own maximum profit. It is in the interests of these operators to maintain the disconnection because a closer connection would bring more accountability to them, impacting their profitability. It is in the interests too of the consumer because they have unparalleled choice and can, by and large, pay what they want at high end or low end food vendors. But they lose touch with the realities and true costs of food production.

It is fundamentally not in the interests of the food producer to maintain this gulf. They have very little power to influence price and no relationship with their consumer.

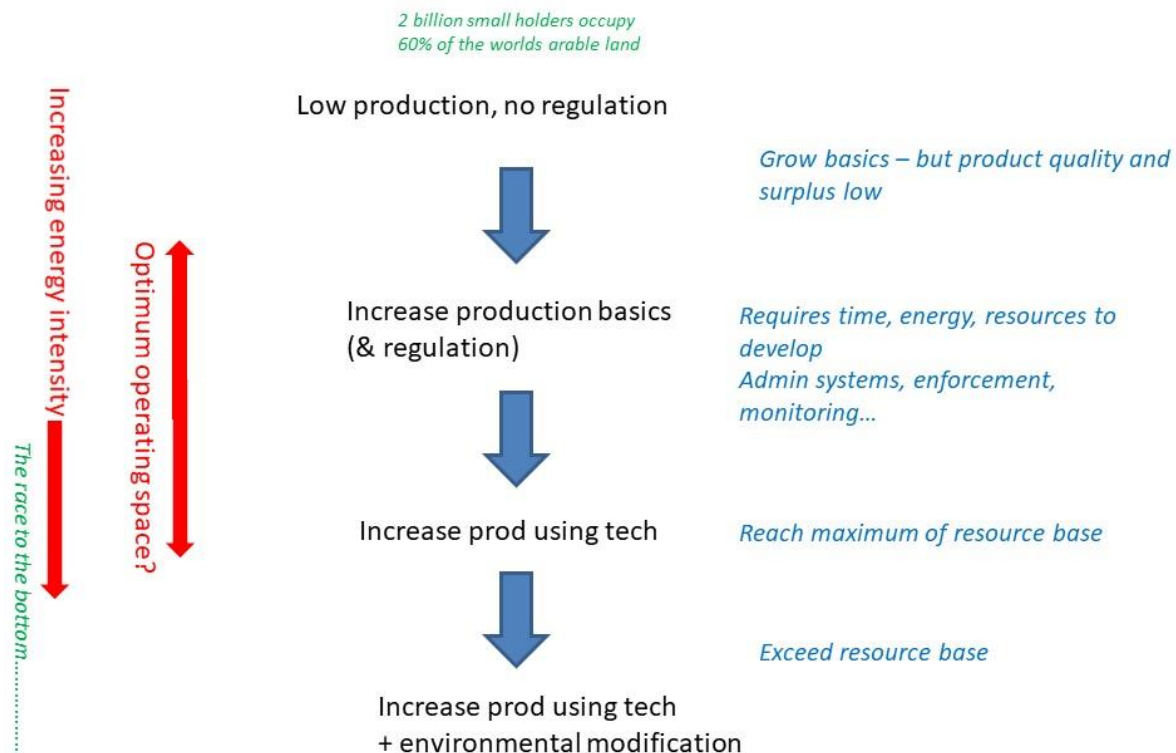
It is fundamentally not in the interests of sustainable food production to maintain this gulf. The true cost of production which includes maintaining the environment, ecosystems, and social networks is ground down to an absolute minimum by the mega operator. This enhances their profit at the expense of the resilience of our food system.

There is no easy solution that would still maintain the low price and wide choice of food to consumers in the developed world. The increasingly popular 'eat local' movement typified by farmers markets and promoted on some restaurant menus is in part a solution. But it holds little appeal to those who do not live in areas where food can be naturally and cheaply produced. Nor does it appeal to the majority of our population who enjoy the incredible diversity and low cost of food.

The race to the bottom and its relationship with the technology spectrum

For virtually all food systems, investing in technology enables greater production. Investment increases as systems become more complex and a return on greater investment takes longer to realise, especially if the price of food does not increase accordingly. But everyone from the small holders in Eburru buying their first glyphosate to those running the robot dairy farms in Oregon were heading up the tech spectrum on their race to the bottom of production costs.

Theme: Development spectrum



My slide from a recent presentation outlining my 'development spectrum' view

I saw that many of our highly developed production systems have exceeded our optimum operating space. What to do?

Two billion small holder farmers are farming 60% of the world's arable land, much in a very low state of development. Also in areas where human population is projected to grow most strongly in the coming decades. So global resourcing should be directed to improving their productivity. Huge gains are possible here for modest effort. And they can offset production drops in other systems as they shift back toward the optimum operating space. It only needs the transfer of existing technologies, not further research into intensification. Investment should go here. Or it shouldn't if we're avoiding overpopulation. I'm reminded of a famous line from one of the truly masterful thinkers I've been lucky enough to meet, the late Professor Al Bartlett in Boulder, Colorado that went along the lines of "name me one issue we have on this planet, environmental, social, or otherwise, that is actually improved by greater populations of humans."

There is a nasty hook on the finish line of our race to bottom of production costs.

Fundamentally costs are reduced through several mechanisms. One is making ever greater use of cheap, abundant fossil fuel based energy which is such a fantastically rich and versatile power source that nothing else on the planet can compare. The second is making ever greater use of scale and intensity - bigger equipment doing bigger jobs faster and with more energy intensive fertilisers and

chemicals and less human effort. Technology is a great aide in this. A third is producing food with minimal expense spared in support of environmental, community, and ecosystem services.

Looking ahead to 2050 and our new low-emissions global economy we are retracing our steps back down the racetrack. We will be using less fossil fuels. We will be growing food more locally and sustainably, not so much on the vast scales in degraded environments of the present. We will be investing substantial amounts in the conservation and recovery of our environments and our ecosystems and our people and where they live. That will be the end of the super low food prices we are enjoying today. There is a prize, a bottle of Laphroig whiskey, for predicting the lowest point, the asymptote of world food prices.

Quality and availability of labour

An artificially low price for food means food production industries are not financially attractive to smart young people.

They will naturally go where resource abundance is greatest. These days that is to the cities to study computing. There is no need to labour this point any further.

Population growth – how much and where

Berry Martin (Rabobank) said at the CSC that his organisation anticipates the need to double food production by 2100 but without the addition of any new arable land. This is on top of an already incredible reduction in the availability of arable land per capita from 1.4ha per person in the 1960s to 0.7ha per person today.

	Population today (billions)	Predicted for 2050	Predicted for 2100
Americas	1	1	1
Europe	0.75	1	1
Africa	1.2	2	4
Asia	4.5	5	5

Clearly most of the population growth is projected in less developed countries.

Comparatively, Asia is short of arable land, with 65% of the world population but only 35% of arable land. Trade solves this issue. But it requires a high level of organisation, energy and financial investment all of which may well come into question as resource scarcity and efforts to curb emissions become more intense.

The insight I drew from this was simply a re-emphasis of my point above that resources and technology must go more toward these areas. That is if we want to maximise human population.

Food distribution and diet.

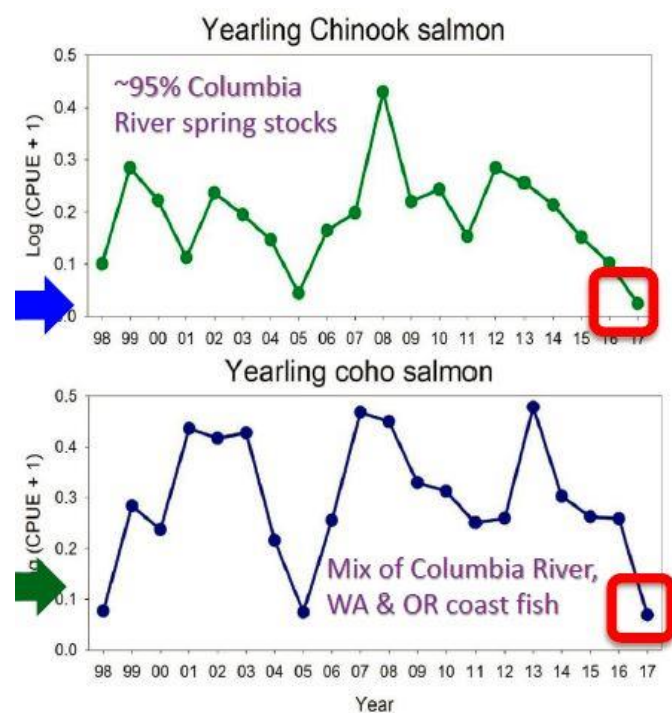
7.6 billion people, 2 billion overweight, 0.6 billion obese, 0.9 billion hungry. Half the world population has an issue with food. The list of problems in the world is long, but growing sufficient food and knowing what constitutes a healthy diet are not on it.

Climate change and the risk of complexification to avoid action

The predicament consuming the salmon and oyster industries around Portland Oregon symbolised the human response to climate change. It was described by the staff of the Hatfield Marine Centre in Portland.

A warm 'blob' of atmospheric pressure developed in 2013/14 in the North Pacific ocean triggering marked changes for several years in the abundance and behaviour of the creatures within it. Of particular importance to the local industries are salmon and oyster numbers.

Acidification levels associated with this warmer sea water are astronomical, at levels expected in the year 2200 based on climate change modelling. Salmon catch is down 80-90% on original levels and the acidified sea is known to interfere with their olfactory development when young. It also changes the concentration of aragonite which affects shell development in young oysters.



Decline in salmon numbers presented by researchers at Hatfield Marine Centre

There is recognition that real world problems need to be solved. Interdisciplinary approaches are attractive as they enable integration of an issue's many scientific, social and economic elements. But by this virtue they are also flawed as they add many dimensions of complexity. What it seems the most common conclusion that everyone can air their view on is that the problem is clearly intractable.

A key insight from my GFP was that problems are not solved by adding complexity to them. Nor are they solved by adding greater human populations to them. They are solved by firstly reducing them to the simplest components possible, then acting decisively on the necessary components. No problem needs to be too complex to fix. But most environmental and sustainability problems faced by the modern world are made too complex to fix so we can continue our present way of life.

A most elegant example of this we saw in Capetown. The world has watched in fascination as 'Day Zero' has stalked closer, then receded, then come again, the day the city runs out of water. We were lucky enough to pass one of the dams that usually supplies it which you will be forgiven for thinking looks more like a desert. It's bone dry.



Josh Olton at a dam for water to supply Capetown

In the months prior to our visit when things were getting desperate they didn't launch interdisciplinary studies or form discussion committees. They identified the nearest significant water source, an irrigation dam for rural purposes and far from ideally located. They let it drain downstream to their chosen point from which they pumped it halfway up a mountain to another holding dam. From there it could drain a further 50km down into a separate catchment to Capetown. They simplified the problem to its basic components and solved it.

Remarkably it rained heavily all night on our last evening in Capetown and Day Zero has since been postponed for over a year, though I'm unsure that the two events are linked.

Sustainability as a first world problem.

Another insight I had was that 'sustainable' farming might have (at least) two quite different meanings. For the two billion small holders who farm 60% of the world's arable land at generally low intensity sustainability probably means having a mix of animals and crops that produce reliably within resource and environmental boundaries. That is; they can sustain themselves and perhaps

their community year after year. While for large, highly developed intense systems, sustainability means, the right mix of crops and animals that maximise profit year after year from their resource base, but notably without degrading that resource base. The term degradation is open to interpretation, where for some it will mean any loss of quality at all, while for others it will mean no loss of quality so great that it impacts on farm productivity, or other environmental factors. The business of subsistence is far more serious than the business of making profits. And boiled down, the question of sustainability is a question of **intensity** where systems enable easy intensification, and a question of **resilience** for the low intensity small holder.



Road side food stall, Kenya

The relationship between the stage of development in a country and its ability to respond in a coordinated fashion.

Much like the world, the smart phone in and of itself is not enough. It needs to be used effectively in an environment that has the capacity to respond. Education and the systems of trade, law, order, and food production take a long time and enormous investment in both human and material resources to develop but they're essential to a robust increase in a country's food production, along with the numerous other systems that create a vibrant society.

Land reform in South Africa is more likely to send the stage of development there backward rather than forward in the short and medium term at least. It is such an immense and impossibly intractable issue given their history that for our generation it will probably reduce the collective ability to produce food rather than improve it. The culture is more oriented to improvement of the individual lot, rather than the collective lot in South Africa.

Wayne Dredge was our stand-out GFP host in my opinion. His depth of knowledge and probably more importantly his awareness plus his constant pushing to get we scholars to investigate the history and political landscape as much as the farming landscape resulted in my experience of South Africa being one of the most fascinating of the trip.

The hunger for knowledge

One of the most inspiring insights came from our visit to the Eburru farmers group in Kenya and the field day for farmers held in Limpopo province near Johannesburg. It was simply the enthusiasm and hunger for knowledge in the young and not so young farmers attending these events. The Nuffield scholars played a central role in both of these days, receiving numerous questions, describing their own farming systems, and engaging in discussions about how the locals might modify their systems to improve. There were many similarities with events run in my area of work with the New Zealand Deer Industry. Groups of motivated farmers have so much to gain by working together and bringing in external expertise when necessary. This is particularly so once the group members have gotten to know each other in the transition from a bunch of individuals to a cohesive and constructive group. But also like home, a thought had to be spared for what a tiny proportion of the farming population was represented at the gathering and how all the others could be convinced of the value in participation.



Some of the changes discussed were behind the farm gate and these tended to be comparatively simple. But talks usually expanded from there more widely to improving the systems for organising farm inputs and distributing and selling produce. At this point the critical value of the intricate web of networks New Zealand farmers rely on was plain to see. So was the immense challenge in building up these networks for the Eburru locals.

At these events were representatives from local industries and markets to tell the farmers about opportunities they could offer. Fundamental to making developmental progress here is being able to get low-cost, flexible ways of transporting and paying for goods, plus farmer training systems of which there are none.

The smart phone for communication has been transformative. So have things like the phone based banking system M-Pesa which could well be applied beyond the half dozen countries it currently operates in. Also transformative has been the Chinese motorcycle. They are low cost at around \$350 (US). Easily modified to suit the owners purpose they are also cheap to run and maintain. In Africa and Asia they are a central part to the transport system in their own right. Low cost, low tech, but very high success.



Culture and its power in food production

The impact culture has on productivity was also a remarkable revelation for me. A highlight was the inclusivity evident in many places. Places like the Kasima farm and AusQuest in Kenya, Fynbloem and Fruitways in South Africa and the big operations in Ukraine. While extreme inequality was rampant in the surrounding area, these places typically employed more people than necessary and supported their families and communities with more than just wages. For example the provision of housing and schools, training, and bonus systems so that all staff benefited in times when profits were good. There was an inspiring sense of cohesion in these places.

An eye opener from the cultural perspective was the industrious capacity of the Dutch. Seeing the decisive action that they will take as a nation to improve their lot made the cultural drive of many other nations appear confused and conflicted. From their reclamation of land from the sea to the organisation of their social systems. Also their highly developed food production and distribution systems (historically strongly enhanced by the canal networks). To some extent also their belief in change for the collective good. These things have empowered their success and as far as I can see they should continue to do so.

What struck me about the African culture was a phrase I heard several times 'what's in it for me?' Underlying this I felt was the sense that it was good to make money from any opportunity. But better still was to make money at the expense of the rest, rather than to work together so that everyone profits. This culture is stronger in certain tribes than others and historically it was symbolised by the ambition to conquer and dominate, rather than profit.

It is deep seated. To the point where the process of putting together a group to achieve a commercial or practical goal must consider the tribal makeup of that group in order to succeed. At the ground level, this makes establishing and maintaining collective organisations a challenge. For example the larger organisations that support farming communities, both for farm inputs and outputs. This mentality makes progress a real challenge. At a higher level and with much larger investments it is still evident. For example the very strong returns on money invested with the government which is essentially a means of directing profits from the development it is funding toward the primary investors rather than the community.

The bottom line, after seeing this culture in Kenya and South Africa, is that it will be a significant challenge substantially lifting the level of development. Let alone Nuffield scholar Steve Gunye's vision of Africa 'leap frogging' advances by fully developed nations by virtue of it's young, internet connected population and enormous potential.

The American political culture in Washington DC was astonishingly bullish at the top, but then as we descended the tiers of power speaking with other organisations like the National Farmers Union and the Farm Bureau their position became more circumspect. Then in speaking with individual farmers on their own time, there was quite the mix, some confident, others not so much after five years without profit. The sheer size of the place and the complexity of the political and farm industry organisations was something to behold. As to who was right or wrong, well who could tell?

Broad characteristics of the culture in Ukraine that I found most prominent were a sense of inward focus, an aversion to collectivism in any form, and a deep atmosphere I can only describe as melancholy. Listening to David Sweere who was from the US but had been running a grain business there for over 30 years a couple of points shone out. He had been there at the personal request of Mikael Gorbachev at the time when the collective farms were collapsing. He had been amazed at how well they worked, with a staff of around 1000 people and a lot of small scale machinery they had been immensely productive, he said. But the collapse, war and a 300% devaluation in currency transformed the social and business landscapes. Much of the land went to the oligarchs. The ripple on effect, he said, was killing the villages. The culture seems in a way depressed as a result.



Locals packing grain in on one of the Sweere's production lines.

What is the difference between corruption and sharp entrepreneurial practice

There was a fine line we discussed several times in Ukraine and Africa between corruption and astute entrepreneurial practice. It often included debate on the merits of the widely held belief that 'Africa has all the necessary rules and regulations, it's just that few people use them'. The value of those merits depended entirely on the position of the individual.

For example, Stuart Barden of AusQuest in Kenya said he'd been approached at least ten times that year by people offering obviously corrupt deals. He had declined as he is monitored very closely by

the local authorities. Another example was the purchase of water rights for irrigation in Ukraine. This drove profits for the big farming operations, but at the expense of the local water supply.

It is an interesting thought experiment to consider whether 'corruption' is destructive to a system or simply a sign of that system trying to grow into another form. It is similar in many ways to the essence of disruption.

Global trends and uncertainty amongst experts

One insight that began during the Contemporary Scholars Conference and grew on during the GFP was that there is tremendous diversity in opinion of global experts around human population growth, sustainability, food supply, and the road to 2050.

I am largely a data driven kind of a person, at least professionally. My work is often complex statistical analyses and interpretation of numbers. I have a working understanding of the overall trends and numbers we see today in relation to these topics. But I am far less sure of the future than before.

After listening to the views of top level staff from Rabobank, the Food and Agricultural Organisation (FAO), Wageningen, the leading agricultural university in the Netherlands, Cargill (the huge global feed supplier), and experts in sustainability and organics I am wracked with more doubt than in the past. Their views were so diverse and so often in conflict that I'm driven to rely more on my own interpretation of the numbers. On one hand the global reports from these institutions are gospel for all intents and purpose, but on the other they represent such vastly different opinions.

Here's a good example. Rabobank projects Africa to grow by over a billion people by 2050 and is concerned about its ability to feed itself. Steve Gunye, an international agricultural expert from Kenya responded that the average age of Kenyan citizens is eighteen. Internet access is available in 78 percent of the country. Education is booming, inevitably slowing population growth. He said as the present low levels of production increase, this country is more likely to be **exporting** produce than importing it by 2050.

We saw strong evidence for both views in Kenya and South Africa.



Local and large scale food production in Kenya

We saw exactly the same scenario in the Ukraine. Opposing expert opinions applied just as validly there too.



Local and large scale food production in Ukraine

What struck me was we are living in two vastly separate worlds. One world inhabited by 2 billion small holders. The other symbolised by Western broad acre farming, their great machines, incredible mosaics of systems and utter and total dependence on cheap, abundant energy.

The role of energy in food production

The overwhelming insight I am left with is also the starting point for my next round of travel. Nowhere throughout the Contemporary Scholars Conference and the Global Focus Programme did I feel like presenters, scholars, our hosts, or the people we met understood the role that energy plays in their food production system.

Of course everyone knows that energy is embodied in the electricity, diesel, petrol, kerosene, and heavy fuel oil that drive the tractors, trucks, aeroplanes and ships which cultivate and distribute our food.

But no one appreciates the other layers of food production that are driven by energy.

Chiefly in the manufacture and distribution of fertilisers, agri-chemicals, animal health products, and all the other farm inputs. Nor do people appreciate the energy it takes to drive the processes we apply turning raw products into the food we eat. Things like drying, heating, milling, cleaning, and storing for long periods under specific conditions. Not to mention the energy required to construct, maintain, and recycle the factories and processing plants where all this takes place. On top of that we have the energy that drives the industries and systems, plus training, housing and servicing the staff that design and build our machines, maintain the grain ships, fly the planes so safely and so on and so forth.

Energy underpins food far more deeply than people appreciate. The vast majority of it is from fossil fuels. Intimately associated is the emission of greenhouse gasses.

Any ambition to reduce emissions implies a reduction in fossil fuel use. Commonly, this is seen not so much as a reduction but rather as a transition from energy in fossil fuels to energy from wind turbines, photovoltaics, or other 'renewable' sources.

This transition pathway must be plotted with a clear understanding of how much energy comes from which sources and what the implications are of shifting our relative reliance on these sources. Doing this for the security of our food systems should be considered a priority and a fundamental step toward preserving social stability and cohesion in the future.

An insight or two about myself

I was most impressed on a personal level by Ronald Pelgrom and his family who had a dairy farm and produced ice cream in the Netherlands. They were the only operation we visited who made a point of explaining that they were content with their situation. In particular they did not see the need to expand further (with the possible exception of new ice cream flavours), rather they sought to do things better. Their attention to herd health was far above any other operation we visited. They were consciously existing in light of the fact that we live in a finite world and their little part of it was plenty enough for them.

That mind set I thought was the perfect example of what so many more of us should adopt. Myself included.

Another insight about myself was the sheltered existence I lead here at home in Dunedin, New Zealand. Exploring the histories of the more turbulent nations we visited made me realise I feel lucky to have that existence and that I am not driven by an adventurous spirit to experience the more conflicted parts of the world. Hunting in the mountains will do just fine for me.

My final insight is of my admiration for visionary people brave enough to speak about how they see the future should be. Michael Horsch stood out as one of these people. He spoke to us for much of a full day about so many of the issues facing future global food production with knowledge, authority and inspiring enthusiasm. And he spoke just as vigorously about the things he and his company are doing to overcome them. He had a good heart too in his concern for ethics and social stability and improvement. I hope I can cultivate more of his qualities in myself over time. And I hope that as we head into the future he and people like him can join together to meet the challenge.



Michael Horsch