



THE CRAWFORD FUND
For a Food Secure World

THE BUSINESS OF FOOD SECURITY:

Profitability, sustainability and risk

The Crawford Fund
2015 Annual Parliamentary Conference
Parliament House, Canberra

10-12 August 2015

Editor: Janet Lawrence





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The Australian Academy of Technological Sciences and Engineering established the Crawford Fund in June 1987. Named in honour of the late Sir John Crawford, the Fund commemorates his outstanding services to international agricultural research. The Crawford Fund is a non-profit, non-government organisation, dedicated to raising awareness of the benefits to developing countries and to Australia of international agricultural research. The Fund depends on grants and donations from governments, private companies, corporations, charitable trusts and individual Australians. It also welcomes partnerships with agencies and organisations in Australia and overseas.

The Fund promotes and supports international R&D activities in which Australian research organisations and companies are active participants. It supports the work of the Australian Government's aid program, particularly with the Australian Centre for International Agricultural Research (ACIAR), the CGIAR Consortium and other international research centres.

The annual Parliamentary conference is a key part of the Fund's public awareness campaign, which increases understanding of the importance and potential of international agricultural research, its achievements and needs.

The Fund also runs training programs that fill a niche by offering practical, highly focused non-degree instruction to women and men engaged in agricultural research and management in developing countries.

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Foreword

The Crawford Fund's annual conference on food security now holds a key place in the development and food security calendar. The conference in 2015 focused on the importance of collaboration and partnership between the public and private sectors to achieve sustainable intensification and improved food security. The reason for the focus on the private sector this year was the belief that meeting future food demand within the limits of the earth's natural resources is a pressing challenge with critically important roles for both the public and private sectors. Innovation underpinned by targeted research investment is critical to achieve sustainable intensification of agricultural production.

In the words of our Chairman John Kerin: 'We see that new visions are needed for both the public and private sectors to maintain sustainability while ensuring profitability for those relying on and contributing to food security. We want this year's conference to help shape these longer term visions.'

The conference connected with business to explore new directions in research and sustainable sourcing already being taken by the private sector and to assess the implications of this for public policy and a new generation of public private partnerships. The program included the Sir John Crawford Memorial Address, presented by Dr Cary Fowler, crop diversity advocate who has overseen the development of the Svalbard Global 'doomsday' Seed Vault.

This was followed by a full-day Parliamentary Conference on 11 August, featuring key speakers Her Excellency Gerda Verburg, Ambassador, Permanent Representative of the Kingdom of the Netherlands to the UN Organizations for Food and Agriculture, Chair of the Committee on World Food Security (CFS) and Chair of the World Economic Forum Global Agenda Council on Food and Nutrition Security, Mr Anthony Pratt, Chairman and CEO of Pratt Industries and Global Chairman of Visy Industries, and Mr Chris Brett, Senior Vice President, Head of Corporate Responsibility and Sustainability, Olam International. We finished with a Parliamentary Breakfast on 12 August.

Forty-five young agricultural scientists attend our event this year, made possible through our Conference Scholarships. This has become a star feature of our conferences, and we look forward to ongoing support for these vital young people, the future of agricultural research, to attend future conferences.

Hon. Margaret Reid AO

Acting Chair

The Crawford Fund

SIR JOHN CRAWFORD MEMORIAL ADDRESS

Facing the uncomfortable challenge of food security

Cary Fowler

Crop diversity advocate who oversaw the development of the
Svalbard Global 'doomsday' Seed Vault

Abstract



Today agriculture faces threats that are arguably more daunting than in any previous era. The basic components of food production – land, water, nutrients, climate and crops – all appear poised to undermine rather than improve food security and thus threaten national security and peace. This address enumerated the impediments to crop production and posed the question of whether we are prepared to help crops adapt and flourish in these changed conditions. Dr Fowler concluded with a virtual tour of the Svalbard Global Seed Vault – a notable effort to fashion a long-term solution to the loss of the genetic diversity upon which agriculture will depend in the future.

Deep in our hearts we all know and agree on three important things about food security and the future. The first is that we're going to need to produce much more food in the future, something like 50 to 70 per cent more. The second is that we're probably not going to do that in the same way that we've done it in the past. There are limits to the amount of land, water, energy and resources that can be devoted to agriculture. So pick your timeframe – 10 years, 20 years, 50 years, 100 years – but you'll agree that at some point in the future agriculture is going to change in probably some fairly fundamental ways. The third thing we know is that we're not acting as if we actually believe the first two things.

In an impressive book published some years ago called *Feeding the Ten Billion*, the Australian crop physiologist Lloyd Evans laid out the six possible ways food supplies can be increased:

1. Increase the amount of land under cultivation
2. Increase the yield per unit of land
3. Increase the number of crops grown per year
4. Replace lower yielding crops with higher yielding ones
5. Reduce post-harvest losses
6. Decrease the use of feed going to animals

Until the mid-1980s the dominant factor in increasing food production was expanding cropland. As population increased, people cut down trees, cleared land and produced more cropland and therefore more food. But in the mid-1980s something quite dramatic and historical happened. For the first time since the dawn of agriculture, the greatest portion of the additional food being produced came from intensifying agricultural production. It was not generated by increasing the amount of cropland.

Ways we could increase production

Moving forward there are many things that we could do to increase production. We could all become vegetarians for instance. That would address number six on Evans' list. It would make much more food available. But, how likely is this to happen and how quickly? I think that you have to agree that number two – increasing productivity – is really going to be the crux of the issue moving forward. This is where we really must make serious progress. Yes, there will be more crop land in the future, the estimates are perhaps five per cent more by mid-century, but number two is really where the heart of the matter rests. And yet there are some significant obstacles to producing more food through intensification of agriculture. I will briefly outline some of those obstacles.

The first is water; I don't really need to talk much about that in Australia. Agriculture takes 70 per cent of fresh water supplies around the world, 80 per cent in the United States. Do you know that so much water is stored behind dams and in reservoirs in the world that this weight has added a measurable wobble to the spin of the earth according to NASA? And yet that's not enough water for our needs. There are 37 major aquifers in the world, 21 of which are in decline; 13 of which are in serious decline where there is little to no replenishment. The aquifer in the Mid East, the Arabian aquifer, is probably the worst of all. You can imagine what that portends for the future. The overdraft is some 50 per cent in parts of India, 25 per cent in China and yet even this dramatically unsustainable rate of depletion is not enough to meet demand.

Looking forward we're anticipating a 400 per cent increase in need for water for industry. The International Water Management Institute, one of the Consultative Group on International Agricultural research (CGIAR) institutes, is estimating that by mid-century the demand for water in agriculture will double. That's quite interesting, since we're already using 70 per cent of total fresh water supplies. Obviously something has to give.

If you consider nutrients, fertiliser use in this world is up 23 times since I was born. We know that there is likely to be peak phosphorus production in this century, perhaps even as early as mid-century.

Turning to climate, we face even more challenges

I realise some people in this country and others don't believe in climate change. In my opinion the scientific evidence for climate change is absolutely overwhelming. But whether what we are experiencing is climate change, or natural fluctuation, or just coincidence, the truth on the ground is that farmers are experiencing a lot of bad weather. This past June was the hottest June in recorded history, both for land temperatures and ocean temperatures. It was about 1.25°C higher than the 20th century average. At 2.0°C many of our crops will enter uncharted territory in terms of climate. But June was no anomaly; it was the 364th consecutive month in which the temperature was greater than the average temperature for that month for the 20th century. That's a lot of coincidence, 364 consecutive months of higher temperatures than the 20th century. In the future, the coolest and best growing seasons are going to be hotter than the hottest of the past according to current accepted climate projections. The best growing seasons of the future will be worse than the worst of the past. The thought is humbling.

What does excessive heat do? It affects all plant parts and all plant processes. It alters the life cycle. And of course at a certain point it begins to reduce yield, quite dramatically. But heat comes in many guises and there is no single crop gene for heat tolerance or climate change. So what is it that plants are going to have to adapt to? They will have to adapt to higher average temperatures, higher extremes, longer periods of very extreme temperatures, higher minimum temperatures, and higher night time temperatures. They're going to have to adapt to

hot weather during very inconvenient times for the plant such as flowering. And they will need to adapt to more temperature fluctuations.

There is another thing to which crops must adapt, something that's rarely mentioned. With climate change you get migration, changes in the natural range of insects, pests, pollinators, all kinds of living things. As a result, our crops will be growing amongst new combinations of species.

In summary, there will be dramatic new combinations of temperatures and precipitation, and new and novel assemblages of species for which there are no historic analogues in agriculture. Moreover, from an evolutionary and agricultural perspective, these changes are coming very rapidly.

Two messages emerge from the foregoing. The first is that these developments are going to create added uncertainty, surprises, and heightened risk in our production systems. This is going to be manifested, I predict, in market disruptions, in higher food prices, in food export bans and in political upheaval and civil strife. And of course it will lead to greater food insecurity for the people who are already food insecure.

The second message is that we cannot expect our crops to come pre-adapted to climates and environments that have never before existed.

What do we know about adaptation?

We learned a considerable amount about adaptation in 1859 with the publication of *On the Origin of Species* by Charles Darwin. Darwin argued that the combination of variability, inheritance, natural selection and time explains adaptation and evolution. Darwin spoke about natural selection daily and hourly, closely scrutinising variability. Fortunately we still have genetic variability in our conserved crop genepools. There's no more valuable natural resource on earth, and there's no resource upon which people across the globe are more interdependent.

In the mid-1990s, I was recruited by the Food and Agriculture Organisation of the U.N. to move to Rome and head a team to make the first global assessment of the state of the world's plant genetic resources for food and agriculture. Part of the concern at that time was that we had lost, and were continuing to lose, crop diversity.

What I found working at the U.N., looking at the state of plant genetic resources, was that we had a number of good genebank collections around the world. There are people in this room responsible for the new genebank in Horsham, Victoria, and I think you should give them a hand because it is a fantastic facility and operation!

More often than not, particularly in developing countries, I found that the genebanks were sub-standard. The materials in them were poorly housed and rather often poorly managed. None of the genebanks in the world had a secure multi-year budget and more than a few of these genebanks had become hospices and I'm sorry to say that a few were even like morgues. My mentor in this field, Jack Harlan, cautioned that if you're willing to trust the fate of mankind on these collections you're living in a fool's paradise!

So the question is: if we have this great new genebank in Horsham, why should we care about the others? In my country, the United States, we have a fabulous national genebank. Should we care if there's another country that has a genebank in disrepair? There are really two reasons to be concerned.

The first is that we're all interdependent and our genebanks and our plant breeding programs are interdependent. So you might think that a country like the United States with a gigantic and very important wheat industry would have a huge collection of wheat samples – and it does, it has five per cent of the genebank samples of the entire world. Australia has three per cent. So looking forward, if a country like the United States is content to say that it has all the traits it will need within the five per cent of the global samples it manages, fine. But my guess is that most plant breeders would say that the other 95 per cent could be interesting – even critical!

The second reason is that all genebanks are vulnerable. For instance, a fire went through the Philippine National Genebank and destroyed part of that genebank – the part that had not been damaged by the typhoon that came through a couple of years before that.

In a sense we are our brother's keeper. If you think about these resources as being important, if you think about all the countries of the world being interdependent, and you consider the fact that all of these facilities are in buildings, that they're subject to natural disasters, they're subject to equipment failures, human error and budget cuts as well as natural disasters, fires and civil strife, then you will realise how very vulnerable this 'systems' crop diversity is and how vulnerable, therefore, our agricultural system might be.

About ten years ago a couple of us got together and decided that enough was enough, because we'd had enough of seeing this diversity become extinct through human errors and budget cuts and civil war, and we decided to try to do something about it.

The result was the Svalbard Global Seed Vault

Svalbard is very remote. If you're in Rome, Italy, and you fly to Oslo you're almost half way there. It's a long way north. It is a remarkably beautiful place. I know some of you have been there.

Our idea was to build a seed vault that would essentially run by itself with no on-site staff. If you want to conserve seed over the long term, you freeze it. But we didn't want to depend totally on mechanical freezing equipment; we wanted to benefit from the natural freezing offered by Svalbard's permafrost by being about 130 metres inside the mountain. It wasn't an easy facility to build, everything had to be imported and the construction workers had to be strong and tough.

The Global Crop Diversity Trust has been quite active in sourcing the seeds and working with developing countries and working with the CGIAR – and Australia – to move seed samples up there. Seed deposits are made a couple of times a year. Boxes of seeds arrive at the airport in Longyearbyen, Svalbard. They're brought up to the seed vault by a cleverly titled transport company called Pole Position. When you walk

through the front door you're looking down a long, gently downward slopping tunnel. This is practical facility, not an antiseptic laboratory situation. At the end of that tunnel you come to an expansive, tall ceilinged room. I think of it as sort of a 'cathedral' room.

There are three seed storage rooms just beyond the large cathedral-like space. One is in use. The largest collection of agricultural biodiversity in the world is stored within this room in the Svalbard Global Seed Vault. It houses and protects seed samples, about 500 seeds per sample, of 864,000 different crop varieties. There are more than 120,000 different varieties (or more properly 'populations') of wheat, more than 120,000 different varieties/populations of rice. There are more than 900 genera represented in this room, more than 5000 species originally sourced from 233 countries (including a number of countries that don't exist anymore).

The conservation in this facility is offered free of charge. Funding needs, which are modest, are secured in perpetuity through an endowment established by the Global Crop Diversity Trust. Norway doesn't claim – in fact it explicitly rejects in a signed contract – any physical or intellectual property rights over the material. Deposited materials can only be returned to the depositor, their owner. They are not accessible to any others, including other depositors.

I cannot claim that nothing could go wrong in this facility. But we tried to anticipate and address as much as possible. We know, for example, that if all the ice in the world melts and the biggest tsunami in history takes place at this location, we'll still be about five stories above the water. We also know that the room housing the seeds will remain below the freezing point 200 years from now even in the worst climate change scenario. Something could go wrong, of course, but I'll tell you that when I enter this room I have the feeling that for the first time in history human beings have actually insured the long-term survival of certain species – in this case more than 5000 of them – the species most critical for the future evolution of our agricultural crops.

Addressing institutional risks

Let me now back up and say one or two other things. I serve on the board of trustees of a small liberal-arts college in the United States, Rhodes College. One of the things that we do at the end of every board meeting is close the doors, ask all the staff except the President of the college to leave the room and ask him 'What wakes you up in the middle of the night, what scares you the most as the President of this college?' As a board, it is our duty to be aware of and address institutional risks.

In keeping with this tradition, I want to talk for a couple of minutes about what scares me the most. Yes, I still worry about the fate of crop diversity. The Seed Vault that I dearly love is a wonderful gift from the Norwegian Government to the international community. But it's not enough! We don't need one safe copy of all the biodiversity in the world; we need at least two safe copies. The Global Crop Diversity Trust is the sole formal mechanism in the world for creating a global system and ensuring the long-term conservation and availability of crop diversity. The Crop Trust is trying to build an endowment for this purpose, but it still needs considerable funding to finish the job. So that of course worries me.

Mostly, however, I have to say that I'm worried about crop adaptation to climate change and the assumptions that we're making about this. There's a reasonable, but I think still insufficient, amount of research being devoted to certain major crops – to rice, wheat, maize and soya beans. But I find myself particularly worrying about what I would call the orphan crops, the smaller crops that in many cases are really quite important. I have friends at Stanford University who have published a study of orphan crops. Their work focuses on 27 crops of significance for which there is alarmingly inadequate research commitment globally. These 27 crops occupy some 250 million hectares of cropland in the world – that's about 100 million hectares more than rice, in fact it's more than any of our individual major crops, and about five times the arable land of Australia.

These 27 crops are obviously important but under-developed and under-appreciated contributors to food security. They are crops such as tef in Ethiopia. There are Andean root and tuber crops, crops that you

find in developing-country marketplaces. My point in talking about these is that we cannot assume that these crops are simply going to adapt themselves magically to climate change, all across 250 million hectares.

Probably half of the crops in the world that have been domesticated and have entered into world commerce have never had a single Mendelian-trained plant breeder working on them. So we're facing a situation where, for crops occupying currently more than 250 million hectares in this world, we have very few plant breeders and no additional diversity getting out into the field.

An historical precedent

This predicament has actually been faced by societies before, most notably in the United States where early settlers from Europe found a continent that essentially was devoid of the type of agriculture and crops that we have today.

What did the government do? It imported a massive amount of crop diversity throughout the 1800s. There were government programs to acquire, study, multiply and distribute that diversity to farmers in quantities for experimentation, adoption and further selection and development. In the late 1800s, the U.S government mailed out seed packets to farmers for experimentation. In 1898 it sent out 20 million boxes of seeds, each containing multiple packets. One cannot explain the spread and adaptation of crops in the United States without reference to this mass distribution of diversity. So I ask, could this be done again, particularly in developing countries where there are no breeders and the farmers don't have the appropriate kind of diversity to help them adapt their orphan crops to climate change? Could diversity once again be distributed and deployed for the purpose of promoting experimentation and adaptation? Is there a realistic alternative?

This is neither the time nor the place to go into this subject, but I ask you to consider whether providing carefully chosen diversity from genebanks and from breeding programs of these types of 'minor' crops might allow farmers to select and accumulate those variations that would help their crops adapt to climate change. Perhaps you will consider this a crazy, radical experiment. But I will point out that we are

now engaged in an even more radical experiment on earth. That experiment is to see if our crops are going to magically and quickly adapt themselves without the aid either of plant breeders or diversity. This is an experiment without historical precedent or scientific basis.

I began this lecture by saying that I thought we could agree on three things: we need to produce more food, agricultural systems are going to change in some substantial ways, and we are behaving as if neither of these things is true. I'm convinced that we're not adequately prepared today for climate change or natural fluctuation or bad weather, or for this month to extend the 30 years' worth of consecutive months of above-average monthly global temperatures. We are not prepared to address this rapidly unfolding crisis, at least for most of our crops.

I acknowledge that conserving plant genetic resources is not a panacea, but I do believe it's a prerequisite, a prerequisite for food security. So I have to sort of shake my head sometimes, realising that I've spent 40 years of my life working on this particular issue and yet we are still struggling with how we are going to fund the genebanks adequately and sustainably. I must say to you that I've never met anyone who said to me: 'Well, Cary we don't really need to fund the genebanks, we don't need to conserve this diversity.' Everybody's in favour of it. But usually what they tell me is: 'This is not a good year for it – you know we've got a recession, we've got unemployment, we've got a war, we've got all kinds of things that we need to do, so this year is not a good year'.

I've been hearing this for 40 consecutive years, so I now know two things for sure: the first is that this year is not a good year. And the second is that next year is not going to be a good year either. In the face of monumental and historic changes in the availability of land, water and other resources, we seem to be pretending that somehow a 'business as usual' approach to food security and food production is going to work. It seems to me that this is short-term thinking, and that short-term thinking has created long-term problems that we're not going to solve by more short-term thinking.

How serious are we about food security and climate change?

Investments in conserving and developing crop diversity will be an early indicator of just how serious human society is about food security and climate change. In the scheme of things, conserving crop diversity, a prerequisite for plant breeding and for food security, is a tiny investment to make that is neither disruptive to our economy nor to our lifestyle. So if we can't make *that* kind of investment, I question whether we're going to make *any* meaningful investments.

I want to spend just one minute talking about political leadership. To political leadership in many countries, agriculture is just a sub-category within the overall economy; it's not a driver of global events. So our agricultural leaders are not our national leaders, and our national leaders are not engaged emotionally, intellectually, politically, in the business of agriculture and food security. Yet the *sine qua non* of leadership is to lead, it's to explain to the public, to one's followers, why difficult things, challenging things, complicated things need to be done. This is the uncomfortable challenge that our leaders face.

Norway has a postage stamp with a picture of the Seed Vault on it. I wish that there were more countries like Norway that had done something so significant and long-term to support food security, that they proudly celebrated it on a postage stamp. We need all countries in the world to have their postage stamp for something that they've done that's significant and important for the rest of the world.

Producing more food sustainably with little if any more land, with less water, with less nutrients, with fewer people, and in the context of climate change – this is not a problem that's confined to the rural areas or one sector of our economy or one government ministry! This is humanity's pre-eminent 21st century challenge. I think that crop diversity has a role to play in meeting that challenge.

Otto Frankel, the eminent CSIRO scientist who Tim Fischer mentioned in the introduction, was one of the founders of the field that I've spent my life working in, and he had three words that he used to describe the relationship, the covenant that we have with our domesticated crops. Reflecting back on the nature of this relationship and on our history, he

said that we have ‘acquired evolutionary responsibility’. I can’t think of a better more accurate, more persuasive, powerful and more humbling comment than that; we have ‘acquired evolutionary responsibility’.

I want to end on a personal note. It’s a great honour to be with you today to give this lecture. I think that Australia has, at least on a per-capita basis, provided more leadership to international agricultural development than any country on earth. It may have started with John Crawford but there have been a number of wonderful people that have picked up that baton. I will mention just a few names because I have been blessed in my life to work with and become friends with some of you in the audience – with some Australians that I believe have been exemplary international public servants: Alison McCusker, Tim Reeves, Meryl Williams, Gabrielle Persley, Bob Clements, the Crawford Fund’s own Cathy Reade, and two of my dear friends Tony Gregson and Mellissa Wood. These people have marvellously enriched our global community and they’ve enriched my life. I want to say thank you to all of them, and all of you.

Dr Cary Fowler is best known as the “father” of the Svalbard Global Seed Vault. He headed the international committee for its establishment and he chairs the Council that oversees its operations. The Seed Vault provides ultimate security to more than 864,000 unique crop varieties, the raw material for all future plant breeding and crop improvement efforts.

In 2005 Dr Fowler led the Global Crop Diversity Trust whose mandate was to develop a rational and effective international system for conserving crop diversity, in perpetuity. In the 1990s he led the team to produce the UN’s first global assessment of the State of the World’s Plant Genetic Resources, drafting and negotiating the first FAO Global Plan of Action on the Conservation and Sustainable Utilization of Plant Genetic Resources, which was formally adopted by 150 countries in 1996.

Dr Fowler was a Special Assistant to the Secretary General of the World Food Summit (twice) and represented CGIAR/World Bank in negotiations on the International Treaty on Plant Genetic Resources.

He has served on many boards, including Rhodes College, the NY Botanical Garden Corporation, the U.S. National Plant Genetic Resources Board and the International Maize and Wheat Improvement Center in Mexico. He is the recipient of many prestigious awards and two honorary doctorates. He is a member of the Russian Academy of Agricultural Sciences and Academy of Sciences. He has lectured widely and is the author or co-author of more than 100 articles and several books.

THE BUSINESS OF FOOD SECURITY

OFFICIAL OPENING

The Hon. Steven Ciobo MP

Parliamentary Secretary to the Minister for Foreign Affairs and Parliamentary Secretary to the Minister for Trade and Investment



Good morning to everyone here from The Crawford Fund and the many experts in the room today from the public and private sectors. It is a pleasure to be here to help open The Crawford Fund's 2015 Annual Conference.

I do not intend now to run through Sir John Crawford's long list of achievements – I am sure that everyone here knows them well. Sir John Crawford was the founding head of the Department of Trade and was central to the establishment of the Australian Centre for International Agricultural Research before a distinguished career in academia. What is less well known is that his role as a pioneer of Australian engagement with Asia.

In a 1938 paper on Australia and the region, he wrote about 'awakening a new interest in our status in the Pacific'. He even went as far to suggest – no doubt controversially at the time – that Australia look to expand trade links with the 'Far East' at the expense of our relationship with 'the Empire'. Without doubt, he was a visionary and it is wonderful to see The Crawford Fund keeping his legacy strong today.

The issue of food security

Food security is one of the most important global issues of our time. Demand for food across Asia will nearly double over the coming decades. Meeting this demand in a sustainable way will require major advances in productivity, market systems, resource management and governance. These must be underpinned by wider and more innovative partnerships that bring together public and private sector interests and responsibilities.

So this year's Crawford Fund Conference, with its focus on *The Business of Food Security: Profitability, Sustainability and Risk*, is certainly timely. The Coalition is changing the way government engages with business

and the non-government sector – and agriculture is no exception. We want to harness the strengths of the private sector and NGOs to find smart and innovative solutions to food security issues.

The Coalition has made agriculture a key feature of Australia's trade agenda, and we've delivered results, including in our Free Trade Agreements with Korea, Japan and China. We have also ensured Australian business expertise in agriculture, fisheries and water management is deployed in our aid program to improve agricultural productivity in developing countries.

The region

While food security is a global issue, it is particularly acute in our region. In Asia, not only will there be an extra billion people to feed, but the middle class is expected to grow from 600 million to more than 3 billion over the next 30 years. When incomes rise, consumers demand nutritious and more diverse sources of food. Inevitably, this means food quality and safety comes to the fore.

This is creating significant new opportunities for countries like Australia. Indeed, we are uniquely positioned to help meet the region's growing food demands. The Government's trade, investment and broader economic policies are designed to make the most of this opportunity. We are taking steps to unlock the vast, untapped potential of Northern Australia and have made food and agribusiness one of five key national investment priorities.

Growing global demand for food also brings with it significant challenges. Australia has formed partnerships with the private sector, NGOs and countries in our region to tackle future pressures on land, water, and energy. Australian research and expertise is improving productivity along food and agriculture chains and promoting more efficient and sustainable use of natural resources.

Australian Centre for International Agricultural Research

The Australian Centre for International Agricultural Research is one of Australia's most valuable assets for connecting our agricultural expertise to the development challenges of the region. Over the years, the Centre has sent many Australian scientists into Africa, Asia and the Pacific to

assist developing countries build the sustainability of their agricultural sectors and the capacity of their people.

The Centre has long recognised the value of engaging with the private sector. In Indonesia, the Centre has teamed up with the Mars company to help Indonesian cocoa farmers provide better quality cocoa and reduce the environmental impacts of cocoa farming. In the Pacific, the Centre is supporting supply-chain and market-driven research in the forestry, fisheries and crops sectors. In Timor Leste, the Centre is working with government and local farmers to identify more productive varieties of staple food crops through the Seeds for Life program.

The Centre continues to make a real difference in our region – developing economies, improving livelihoods and alleviating poverty – and we are excited about its agenda for the years ahead. I encourage all of you to seek out the Centre’s publication ‘Partners in research for development’. The latest issue focuses on the vital contribution that Australian agricultural research is making to the world.

Trade

Trade is a great enabler of improved food security. Trade policy reform is central to enhancing the role of the private sector in meeting global food demand. Agriculture is the most distorted sector of world trade. Australia has long advocated for reducing the barriers to trade in agriculture as the single most valuable step governments can take to support global agricultural development and food security.

The World Bank estimates that reforming trade rules for agriculture would boost global income by US\$265 billion – a substantial portion of this would go to developing countries. We want to see the Doha round of multilateral trade negotiations concluded, with a substantive agricultural element.

The successful conclusion of the WTO Trade Facilitation Agreement shows the WTO can deliver. This Agreement has the potential to generate significant gains for developing countries by cutting red tape and the costs associated with exporting and importing. Businesses should now find it easier to navigate trade requirements and enter new markets.

When fully implemented, the Agreement is expected to increase global GDP by US\$1 trillion per annum and create 21 million jobs. In June, Australia became the seventh WTO Member to formally accept the Agreement – just last month, we donated \$1 million to support less developed countries with implementation.

Free Trade Agreements can also have a significant impact on agricultural trade and development. The China-Australia Free Trade Agreement removed a number of agricultural trade barriers between Australia and our largest trading partner. Our FTAs with Japan and Korea have also removed or reduced tariffs on major agricultural exports.

Agriculture for development

In our immediate region, agriculture will remain an important development issue for decades to come. In Indonesia, over 100 million people still live on less than \$2 a day and many rely on small-scale agriculture.

Through our aid program, the Government is working with the private sector to identify and develop new products and services. We are helping farmers and fishers to reach markets by leveraging private sector investment and innovation. We are assisting partner governments to develop policies that promote sustainable growth and open trade and improve the enabling environment for business and investment.

We are driving innovative partnerships with the private sector in Fiji, Timor Leste and Pakistan through the Market Development Facility. The Facility, which focuses on the horticulture, agribusiness and meat and dairy sectors, has resulted in more than \$3 million worth of private sector investment and helped increase the incomes of 16,200 people.

On the back of this success, the program has been expanded to PNG and Sri Lanka. We are also supporting the new 'Grow Asia' partnership between the World Economic Forum and the ASEAN Secretariat. The Government's \$8 million contribution to the Grow Asia partnership will help to leverage innovative private sector financing aimed at realising the commercial potential of agribusinesses and farmers across Southeast Asia.

Conclusion

Ladies and gentlemen, agriculture is a key pathway for increased prosperity –productive, efficient and market-oriented agriculture is a key source of jobs, incomes and exports. In the years ahead, there is no doubt demand will increase for more efficient food production and processing.

Australia has much to offer in this regard. Our natural strengths in the food and agricultural sector and the partnerships we are forming with the private sector will help address this global challenge. Thank you.

MORNING KEYNOTE SESSION

Visy's contribution to food security

Anthony Pratt

Executive Chairman, Visy Industries

Abstract



Possibly Australia's greatest contribution to global food security is through the production and export of safe, nutritious, sustainably-produced food, to meet the rising demand across Asia and beyond. We need to promote, protect and extend Australia's reputation as a high quality, safe food supplier. Visy supports its food industry customers to do well, which will fuel Australia's capacity to feed 200 million people directly. We can also help feed a further 800 million with the application of our skills, R&D and business services. Supporting our food customers revitalises the food processing sector and tackles food waste by protecting food from deteriorating, which could double the effective calorie delivery from the current level of agricultural production. Reducing food waste by better packaging that extends food shelf life also adds value to our customers and hence to society. Applying business know-how, in collaborative partnership with researchers and farming practitioners, is an important key to achieving this goal.

Why food security? Because it is all about creating a better world for everyone. The UN predicts that by 2050 there will be 9.6 billion people on the planet. And beyond the simple headcount, a huge growing middle class in China and India means a shift to more protein. To produce one kilo of protein, you need eight times more grain and five times more land than non-protein-based food. It's in a world where arable land is shrinking due to the ravages of climate change. But more on environmental sustainability later.

The Crawford Fund has a proud 28-year history on promoting excellent science and collaboration between Australia and other nations which have some of the greatest food challenges. And Australia is in a key position to influence the world in agriculture because of our deep expertise in R&D, NGOs and government experience.

In addition to these public sector strengths, Australia also has a vibrant food production and manufacturing business space. More than that, I will argue today that business is an indispensable partner in delivering food security here and across the developing world. And more than that,

I'd argue that food security is also intertwined with environmental sustainability, economic growth, job creation and philanthropy.

So for Visy, food security is part of a broader subset of sustainable development goals which are all intertwined. I agree with Prince Charles who established the international sustainability unit to deal with the inter-relationship between food, water, energy security, the depletion of natural capital and a more integrated approach between the private sector, government and NGOs, to increase partnerships between these sectors.

Sustainable development actions

Visy has four main sustainable development actions and they all intersect each other.

- By supporting our food and beverage customers in a number of ways; for example, to reduce food waste through more food processing, better packaging – and our customers doing well will help their smallholder farmer vendors (whose advancement is four times more effective than the next best way to eliminate poverty);
- By investing in sustainable infrastructure, such as 100 per cent recycled paper mills, clean energy plants, recycling centres, sustainable packaging and closed loop water systems;
- By employing thousands of people across Visy's global businesses in Australia, America and Asia, recognising that the best social program is a good, well-paid sustainable job;
- By contributing philanthropically to the local communities in which Visy does business.

So let's look at the first one: supporting our customers to deliver food security. At Visy 70% of our customers are in food and beverage - companies like Nestle, Unilever, Pepsi, Coke, Costa – and we support food security by supporting them. We have found that to be most effective, because these customers are on the front lines of the food security cause.

Now with every big challenge like food security comes a parallel business opportunity. If we can do good by helping our customers do well, our hope is that Australia can contribute to food security by feeding 200 million people directly and helping an additional 800 million

indirectly. In doing so it will also give Australia a much needed fillip that we can all gather around.

This is why Visy, in partnership with The Australian, initiated the Global Food Forum in the spirit of collaboration between our customers, government, NGOs and importantly the media. The purpose is to shine a light on the issue of food security, and the opportunity it presents for business using the megaphone of the media.

In the three years since the Global Food Forum began, Australian food exports have grown 26%, more than double the 12% growth of the previous three years. And processed food exports, which add even more value, have grown by 33%, almost five times the previous three years' growth of only 7%. In fact, on the current trajectory, food exports of \$36 billion are converging on iron ore exports of \$52 billion. So the food industry is no longer in the shadows of the mining or car industries.

At this year's Global Food Forum, speaker after speaker highlighted the stellar progress that the Australian free trade agreements (FTAs) have achieved thanks to Tony Abbott and Andrew Robb. By delivering FTAs with China, Korea, Japan and India on the way, the Abbott government has brought consistency of focus to food exports.

Australia is perfectly poised to be at the centre of the global food security issue if we cultivate our resources and play to our strengths. And unlike iron ore, which is a commodity subject to wild price swings, food is less of a commodity because it is increasingly exported as processed plus Australia's brand reputation for reliable, safe food. The export of reliable, safe, food may end up being Australia's greatest contribution to global food security. The demand for safe, nutritious food will rise dramatically across Asia in coming years as purchasing power increases and supply chains elongate. For example, China's larger food companies increasingly look to places like Australia to meet their future demand for safe, high-quality food, especially in the wake of high-profile food security incidents like the 'melamine in milk' scandal – consumers consider Australia's clean, green and safe credentials some of the highest in the world. A can of Australian milk powder sells for \$50 – an enormous amount per tonne.

Per capita, we have 20 times more land than China, India and Indonesia and 60 times more than Japan. And per capita we have 10 times more water than China and 18 times more than India.

It's the Murray Goulburns, the Nestlés, the Unilevers – our customers – that we need to support to get this done. We need to promote, protect and extend this reputation of Australia's food companies. And we do have a great food manufacturing heritage. There is still a lot to do in order to secure Australia's place at the food security table to help the globe. We need to better communicate, cultivate and collaborate!

We must better communicate the fact that food is critical to Australia's future, just as wool and minerals have been in the past. Food is here to stay. It's not a fad. Food production and value-adding is the way for our nation to go.

And we also must better cultivate our land, water and human resources. These essential inputs to the food security equation are actually our national strengths, and we should play to them.

We also must all work harder to collaborate within the food sector here, and with other countries with whom we can do business. Here are some examples of ways we can support our domestic food-manufacturing industry:

- Recruit more of the best and brightest to become agricultural science graduates;
- Attract more capital from overseas for agri-food investments;
- Have accelerated depreciation for new food manufacturing investment.

In short, we have to find ways to revitalise our food-manufacturing facilities. Visy is financially invested in supporting our food and beverage customers' great efforts by beating the drum on all these things and the Global Food Forum has been a great vehicle and platform.

Another issue which we all need to tackle is food waste. Again, our support of our food customers is critical to tackling it innovatively. Food waste is the number one impediment to global food security. Globally crop diseases cause losses of 40% in horticulture, 15% in grains, 50% in fish, and over 20% in livestock. And a further one-third of the food beyond the farm gate is wasted.

Eliminating food waste alone could feed the coming 9 billion people with today's production levels. So why not aim to double the effective calorie delivery from the current level of agricultural production?

Applied business know-how can help achieve such a goal. Only 10% of food grown in India is processed. So the best way to reduce food waste and maximise calorie delivery is to increase that ratio of processed food to total food. Because when a raw food becomes processed food it can be best valued, protected, stored and safely delivered to customers.

So in India we hope our role will be to support our customers, who comprise some of the most modern food-manufacturing companies. This will benefit not just the consumers but also our customers' smallholder farmers. Because supporting smallholder farmers is four times more effective in reducing poverty and hunger than the next best alternative. These modern food-manufacturing companies bring a host of well-trained and strongly motivated people to the food security task.

Australia has those people too. Applied science, education and mentoring organisations like the Crawford Fund, with its unparalleled 28-year track record of support and extension of food and fibre productivity in the developing world, you've been a shining example of what Australia can offer to the world.

I also think of people across the whole Australian food-supply chain – companies like Sunrice, Murray Goulburn, Nestlé and Coles, who are standouts when it comes to progressive thinking. Or Norco, which has cleverly enhanced its supply chain of fresh milk into China through smarter customs clearance at the Australian end. This significantly improves time to market, clearly crucial for a product with only 15 days of shelf life.

I think of ACIAR, which has shown Inner Mongolian pastoralists how, from Australian pastoral research and practice, net household incomes can grow by 50% while reducing sheep stocking rates to match sustainable grazing levels. Through organisations like ACIAR, Australia has been able to bring together the one-time separate aid and trade dimensions of our nation's overseas development agendas. By exporting our food and agricultural expertise, services and know-how we continue to multiply our food security contribution. As the old saying goes: 'Give a

man a fish, and you feed him for a day, but teach a man to fish and you feed him for a lifetime’.

At Visy we are striving to play our part by constantly engaging with our many food-sector customers to bring new technologies to their operations. For example, our Thermotrac technology for temperature control of produce and dairy assists in crucial cooling and temperature in the supply chain, protecting the quality of fruit and vegetables, dairy and other products delivered to consumers. As well, our new ‘in-mould label barrier system’, which reduces the amount of packaging in the recycling stream, reduces tooling and increases flexibility. And we have developed our new two-litre high-density polyethylene (HDPE) milk bottle which weighs just 32 grams.

These technology skills in food packaging and, more recently logistics, help our customers help their customers to extend shelf life and transit life of food to avoid waste and boost profit. It goes back to what I said earlier – the right blend of science, business and collaborative innovation can help solve global food security.

Take Nestlé, one of the world’s largest food companies, which recently pledged to accelerate its commitment to eliminating food waste beyond its internal activities to right across its global supply chains to take on other organisations. Or Unilever, which through its sustainable living plan is mandating things like responsible ingredient sourcing, support for smallholder farmers and eco-efficient transport. The leadership shown by companies like these with their hundreds of thousands of employees, and millions of suppliers, will deliver on the world’s food security needs and support local communities.

Sustainable jobs

Visy’s second sustainable development goal is to employ thousands of people with good paying jobs – because the best social program of all is a good job. It’s no wonder that China, in its current 5-year plan, has linked circular business goals in sustainability with promoting employment as a priority for economic and social development. Likewise India, which has enacted a law guaranteeing the right of rural households to a minimum of 100 days of paid work and has recognised the fundamental power of sustainable jobs.

The food industry is one of the great generators of jobs. Actually the numbers are astounding, and they point to a major growth potential of (by and for) food security, if we leverage the opportunities properly. For example, in India, food processing employs about 48 million people across the economy, and has a very high employment-to-investment intensity. In fact 82 direct and flow-on Indian jobs are created for every \$20,000 invested in the sector. And keep in mind that India currently processes only 10% of its food!

Globally the world's two leading food and beverage companies – Nestlé and Unilever – directly employ over 400,000 people between them. And their massive flow-on employment supports millions of smallholder farmers, local processors and service providers. In Australia the food and beverage industry generates 553,000 jobs, versus only 34,000 in iron ore mining, and 40,000 (and declining fast) in the car industry.

For Visy, 70% of our customers are in food and beverage industries – in Australia, New Zealand, America and Asia – and we employ over 10,000 directly in our own business.

This brings me to Visy's third sustainable development goal – investing in sustainable infrastructure, a key to sustainable development. In Visy's world sustainable development is first and foremost about eliminating waste, boosting productivity and doing more with less. That's how we run our business. It has always been at the heart of our operating model even before the term 'sustainable development' became fashionable – because for us, environmental excellence is good for business.

We have built 16 100% recycled paper mills and our business intervention in the waste paper supply chain helped stimulate national recycling movements; today our recycling rate for paper is 78%, which outstrips the global average.

We took that concept to New York City in 1997 and there we built their first ever paper mill. It was the largest manufacturing development in the history of New York. Before we arrived much of that paper was going to landfill. Today Visy recycles about half the city's recovered waste paper with the Department of Sanitation – so much so that we were able to help shut down New York's Fresh Kills landfill, one of the largest landfills in the world.

Landfills emit more carbon emissions than all of global aviation, because as things decay they emit methane gas (which is 20 times more potent than CO₂ in causing the greenhouse effect. So recycling is an important weapon against climate change.

In 2007 at the Clinton Global Initiative I committed to invest \$1 billion over 10 years in clean energy and further recycling; our goal was to keep recycling our money in things that will build our business, support our customers and help the environment all at the same time.

As I already mentioned, climate change is at the heart of the food security challenge because it reduces the amount of arable land. So to the extent that recycling helps mitigate climate change, it helps food security. And of course, to the extent that we can divert materials from landfill and convert them into clean energy as well, we close the loop once again. By the way, we completed that \$1 billion 10-year pledge in seven years.

Sustainable infrastructure is also a key to social advancement in the developing world, because it adds value to material, creating a virtuous circle of production, sales, material recovery and recycling – a true circular economy. Companies like Smiths Crisps, a division of Pepsico, have worked with us on turning their potato chip wrappers into clean energy. In this way we are working with our food and beverage customers to help them achieve their sustainability ambitions and their supply chains with things like recycling waste water, recovering heat and energy, and reducing food waste.

Philanthropy

Visy's fourth sustainable development goal, philanthropy, is best done within local communities where we do business. When enlightened food manufacturing companies like Nestlé and Unilever are strongly connected with local communities, social capital improves and social disadvantage is tackled.

That's why we want to direct our philanthropy and other support through customers who in turn support smallholder farmers and others in their business orbit. In addition, however, the Pratt Foundation has been a conduit for things like the Global Food Forum for our customers,

NGOs, government, and civil society to come together in support of food security solutions.

We hope that one outcome of that will be excellence for food packaging in India. We think that NGOs like the Australia-America Leadership Dialogue and the Australia-Japan Chamber of Commerce should increasingly incorporate food processors, and not just mining companies, into their agenda dialogues.

The Pratt Foundation in India, through the Australia-India Leadership Dialogue and the trilateral Australia-India-Israel group, is already planning to include food and beverage processors with government, NGOs and civil society, to grow India's calorie delivery to market by a combination of food processing and packaging innovations to reduce food wastage.

Another great example of collaboration would be California imparting their learnings to Australia on how to make more of our land arable. This is a great collaboration opportunity.

Finally, in Australia our Visy Cares youth centres and other philanthropic activities are purposely established in and around areas where we have paper recycling and clean tech plants. They also focus on jobs and job support with a clear commitment to inclusive business. Because – and this is worth repeating – giving people jobs is by far the best way to solve poverty and social needs. In the same way our main focus for delivering on our sustainable development goals is in those communities where we already do business.

I hope I've demonstrated how Visy's four sustainable development goals listed below are all entwined, and that sustainable business is the key to solving the globe's food security challenge.

Number 1: We support our customers tackling food security issues, and in so doing help smallholder farmers while realising other objectives.

Number 2: We champion sustainable infrastructure development.

Number 3: We support job creation and social programs.

Number 4: We practice philanthropy within the communities where we do business.

Mr Anthony Pratt graduated from Monash University, Melbourne, with a Bachelor of Economics (Hons) in 1983. After graduation he joined the consulting firm of McKinsey & Co, before joining Visy. In 1991 he moved to the United States to spearhead the family's business expansion into America, where he built Pratt Industries USA into a billion-dollar company which now employs more US citizens than any other Australian company.

In 2007 he made a commitment at President Clinton's Global Initiative in New York City to invest \$1 billion in clean energy and recycling infrastructure over the next 10 years. Anthony is firmly committed to environmental causes, and he and the company have been honoured by environmental leaders such as former Vice President Al Gore, former British Prime Minister Tony Blair, Ted Turner, the Climate Group and Global Green for spreading the word that recycling is an important weapon against climate change.

Anthony also sits on the National Board of the Muhammad Ali Museum and Education Centre in Louisville, Kentucky, and is active in numerous charity organisations throughout the USA and Australia. He divides his time between Melbourne and Atlanta, where Visy and Pratt are headquartered respectively.

No more business as usual for food security and nutrition: our shared responsibility

H.E. Gerda Verburg

Chair of the Committee on World Food Security and Chair of the World Economic Forum's
Global Agenda Council on Food and Nutrition Security

Abstract



To produce 70% more food by 2050 to feed the expected 9 billion people, it can't be business as usual. We simply don't have the energy or water to sustain such an increase. A world without hunger is within our reach if we are smarter in the way that we use the resources, tools, and technology available to us, and if we are willing to move away from working in silos and embrace a crosscutting and multi-stakeholder approach. There is growing global attention/recognition on the need to transform agriculture and food systems. The way to do this means that each and every stakeholder must play their role and at the same time open up to collaboration with other stakeholders – from big companies, to family farmers, advocacy organisations, research institutions etc. The Committee on World Food Security (CFS) and the World Economic Forum's New Vision for Agriculture are leading the charge on this transformation by bringing together governments, private sector actors, civil society representatives, leading research organisations, financing institutions and many others in order to contribute to the birth of a diversity of solutions to feed the 1 billion people still living in extreme poverty and the 2 billion suffering from malnutrition. Now more than ever, as we are set to agree on the Sustainable Development Goals (SDGs), exploring how we can *intensify* our existing collaboration and *expand* the opportunities to build on each other's strengths is necessary if we are to be successful at bridging the projected annual investment deficit of \$2.5 trillion. Addressing food security and nutrition has at times been a minefield of polarising debates, when in fact the best solutions are often found when we can combine and build on ideas and options from across the spectrum. Not shying away from addressing contentious issues in a multi stakeholder dialogue – like the role of genetic engineering, or the role for smallholders in intensification, how to optimize land use, or how we can combine traditional knowledge with innovation and technology – is the only way to build consensus and truly create food systems, where sustainability and profitability are inextricably linked.

Let me start by saying how honoured I am to be here with you to provide an international perspective, based on my experience as the Chair of the Committee on World Food Security and the Chair of the World Economic Forum's Global Agenda Council on Food and Nutrition Security, on how to achieve a vision where sustainability and profitability are inextricably linked and the world is without hunger and malnutrition. I'd like to acknowledge the original inhabitants of this land where we meet today, and one of the world's oldest cultures, the First Australians – a group of people whose strength,

resilience and capacity provide lessons for all of us as we discuss how to face the challenges of today.

The challenges we're here to discuss today are well known – feeding the growing population by 2050, as caloric demand rises by 70%, with fewer and fewer resources:

- agriculture uses over 70% of the world's freshwater resources and the world faces a global water deficit of 40% if we continue consuming as we are;
- globally soils are being depleted at 10–40 times faster than they can be replenished.

While the challenges are daunting, they also present a tremendous opportunity for those willing to tackle them and to come up with truly disruptive solutions, to transform agriculture and food systems into sustainable systems that are able to feed the world. I'm honoured to share a few of our ideas on how we think this can be achieved today.

I am not only honoured but excited to be here as this marks my first visit to Australia and the region as a whole. While the Netherlands may be far away in distance – which I can definitively attest to after the flight here – I've learned that we are actually quite close in terms of the way we have confronted challenges and our approach to agriculture as a result.

As many of you are probably aware, the Netherlands has faced considerable challenges to keep flooding at bay – which required us all to work together to reclaim land from the sea by investing in innovation and technology to build the dune, dyke and drainage systems which we have today. Here in Australia I understand that you faced a different challenge – how to bring water to the dry but mineral-rich lands, and that the solutions were found only by partnering together on how to make irrigation more efficient in some areas while drought-proofing others. The lessons illustrated in these examples of the Netherlands and Australia are present in so many scenarios and locations around the world and stress the necessity of: 1) partnership; 2) shared responsibility; and 3) tackling adversity.

How can these lessons help us as we face increasing resource challenges so that we can witness the end of hunger and malnutrition in our lifetimes? To start with, it means assessing the evidence of what these lessons have taught us on the ground. I cannot tell you that we have all the answers, but I can tell

you that these lessons have been embraced by the *Committee on World Food Security (CFS)* and the *World Economic Forum's Global Agenda Council on Food and Nutrition Security*, both of which I am proud to Chair. Both the CFS and the WEF have prioritised a focus on multi-stakeholder collaboration, acknowledging that it will take each and every one of us to truly end hunger and malnutrition. I will share with you a bit of our experience in these three areas, my reflections on what this means at the global level in coming up with disruptive solutions, and where I see the opportunities for Australia within this context.

Partnership

Partnership is one of the buzz words of the last decade, but what are we really talking about when we talk about partnerships – formal or informal?

Wikipedia tells me that we're talking about 'two or more individuals pooling resources or skills' and/or where 'partners agree to share risks and rewards proportionately'. My own experience tells me that partnership means trust, weathering the rough spots, and a focus on the long-term – all of which require considerable time and patience – but also produce a better end result.

As a result of our experience in the Netherlands, a consensus-driven approach comes naturally and we have seen the value of working hand-in-hand with businesses to achieve environmental and social development goals. This is not the case for all stakeholders – many governments and civil society organisations still maintain a large degree of scepticism about 'partnering' with the private sector. While at the same time, I've heard from a number of private-sector institutions that they think the UN is just interested in their wallet when talking about partnering. So the point is, we all come with preconceived notions about what we think a certain 'partner' might be like. But as Ernest Hemingway once said, 'The best way to find out if you can trust someone is to trust them'.

And in fact, we have many examples of successful partnerships at CFS and the WEF, where this leap of faith has provided benefits to each party and enabled us to move closer to ending hunger and malnutrition:

- We recently heard about *Cargill's partnership with CARE International* at a CFS event discussing how to connect smallholders to markets. This partnership has spanned multiple decades and numerous countries, but was renewed in 2013 to focus more on food security and nutrition and to fill a dual need. For example, in Vietnam Cargill has worked with CARE to

train farmers on how to grow sustainable cocoa – Cargill has secured a more sustainable supply and CARE has gained knowledge related to quality seed and animal feed that they can extend to more and more communities. Together they have advocated at the policy level, for greater government support for innovative business models like theirs.

- Mars Incorporated, a participant in CFS, is partnering with the World Food Program and others, including leading research institutes, to advance knowledge and capacity to manage food safety, particularly in the Asia-Pacific region. Mars' supply chain is threatened by aflatoxins, found in peanuts and maize, as is the food that UN agencies deliver in humanitarian efforts. By combining their resources to address this shared challenge, they hope to build the capacity of actors in supply chains to control these risks and ensure food safety.
- In identifying best practices in how to engage youth in agriculture, we recently heard about a new partnership from the government of the Philippines, which has struggled to provide remote rice farming communities with the information and extension support that they need to improve productivity. They have partnered with local research institutes and high schools to enable youth to serve as 'info-mediaries', where they receive the latest information and research via mobile phones and then pass this information on in their communities. This has served as an inexpensive way for the government to facilitate productivity increases while also providing youth with a way to contribute to the food security and nutrition of their communities.

I was just in Manila discussing the *Grow Asia Initiative*, where I was thrilled to learn that after just launching in April, the partnerships between government, private sector, civil society, and research institutions have already resulted in launching 26 projects aimed at improving the efficiency and sustainability of value chains throughout the region. The target is to reach 10 million farmers in ASEAN, enabling them to increase their yields and profits by 20%, with 20% less environmental impact.

What each of these partnerships illustrates is that the key to unlocking sustainable innovation is in looking outwards to identify areas of shared value and win-win opportunities.

Shared responsibility

As we think about creating shared value, we also need to think about shared responsibility. Too frequently we think about what other people aren't doing enough of, or who is to blame for the fact that we still have 1 billion people living in extreme poverty and 2 billion suffering from malnutrition. While we look outwards to identify and build strength by working together, we must also look inwards and accept our role and responsibility, in order to identify where we can add value.

I grew up on a dairy farm with 10 siblings, so I know just how challenging it can be to embrace differences and explore alternate perspectives. I also know that there was no way that we could all stay on the farm carrying out the same duties, if we wanted the farm to be successful long into the future. This meant sometimes making tough decisions, and also needing to be very frank when looking in the mirror about which role would allow us to contribute most effectively to our collective goal of keeping the farm in the family and flourishing.

Just as with each of my 10 siblings carrying out our shared responsibility through different roles, different stakeholders each have an integral and complementary role to play in ensuring that we can produce more with less:

- *Consumers:* I'm beginning with consumers largely due to the sheer magnitude of their role, which is often only discussed as a side note. The consumer influence is twofold – that of rising demand in emerging markets, particularly towards greater calories, protein and processed foods; but also a shift worldwide towards healthier and sustainably produced foods. Over the last decade, consumers have started demanding more responsible investment practices, wanting to know where and how their food is produced, and even willing to pay higher prices for products which meet these characteristics. This trend is also having a growing impact, as consumers call for greater regulation, related to environmental and social sustainability.
- *Private sector:* Companies that have seen this trend growing and headed for the front have already reaped the benefits of this growing market. Witness *Whole Foods Market* in the U.S., now worth over \$8 billion dollars, founded in the 80s on the idea of 'conscious capitalism' – the idea of running a business not just for profit but for purpose, which was highly

criticised at the time. Now Walmart, Pepsi and others are all rushing to catch up. The private sector has the ability and often the incentives to do much more and anticipate or react on changes. The challenges that I identified up front represent tremendous opportunities for the private sector, particularly for those who get out front in emerging markets. For example, one way to do more with less is to reduce waste, which represents a huge value-creating investment opportunity. In China, the cold storage and transportation market generates approximately \$15 billion in revenues. Where the private sector has been able to embrace change and push for innovation, including a supportive policy environment, there are increasing opportunities for achieving transformation.

- *Civil society organisations:* The role of consumers is closely linked with that of civil society organisations, as it is often their advocacy and awareness campaigns that influence consumer preference, and through this there is opportunity for partnerships with the private sector. For example, civil society has been extremely successful in influencing the purchasing habits related to seafood. In Japan – which consumes 6% of the world's fish harvest – the largest supermarket chain has partnered with the Marine Stewardship Council, an NGO, to work together on anticipating consumer preferences and raising awareness about more sustainably harvested fish. Civil society organizations also advocate on behalf of people, who themselves often don't have the possibility to be heard directly. The role of civil society to date is not fully developed in all countries around the globe. In some it may be too adversarial to create an opening for constructive collaboration. There is a tremendous opportunity for civil society organisations to play a much greater role in capacity development, awareness raising, and facilitating the participation of those most vulnerable and marginalised. For example, Oxfam, through its 'behind the brands' program, is playing a leading role working with companies like Unilever and Cadbury in identifying how inclusive business models can help support effective supply chain development.
- *Governments:* The finger is often pointed at governments as having the primary role in achieving food security and nutrition – and their role is significant. But we can also probably all agree that governments are not always the best investors or the best innovators. What governments can

do and should focus on are the areas where they can have a significant influence: 1) providing safeguards for the most vulnerable; and 2) providing a guiding hand and an enabling environment for activities and investments by all stakeholders, which will foster innovation and sustainability. Governments can also provide stable and predictable environments, through longer-term policymaking for stakeholders to engage more deeply.

- *Research and academic institutions:* When we talk about the need to do more with less, research and testing of new approaches and technologies are cornerstones. Despite all the talk about innovation in recent years, productivity growth rates of major crop yields have halved since the 1970s, currently growing at only 1% per year. But we shouldn't only talk about increasing the use of innovative technologies. We also need to focus on the distribution of knowledge, skills and inputs in emerging markets and in communities where productivity is low. Unfortunately, cutting-edge research is often only available to a few; better dissemination and implementation at grassroots is needed to facilitate faster and broader uptake and results.

As I've illustrated it is not the role of one actor to end hunger, nor could it possibly be done by one actor or one stakeholder group.

The anticipated Sustainable Development Goals are projected to face an annual investment deficit of \$2.5 trillion in developing countries. To bridge this deficit, full engagement from all sectors and actors will be critical, and will take the concerted and coordinated effort of each and every one of us if we want to improve access to both safe and nutritious food and improve income for the most vulnerable families worldwide. One question is: how this can be done in a targeted and collaborative way when views on priority areas for investment or types of investment to pursue are so divergent?

Tackling adversity

One of the main obstacles in achieving food and nutrition security in the past has been our approach to the problem. Achieving food and nutrition security touches almost every aspect of our lives and is impacted by decisions and events in almost every sector – from energy, to water, to climate change, to health, infrastructure, technology, transport, and I could go on. We need to stop approaching food and nutrition security in a silo, stop bickering and

fighting among sectors and stakeholders, and instead fully embrace the inter-linkages and understand the trade-offs in order to facilitate the multi-dimensional actions required.

Within the Committee on World Food Security (CFS), we regularly tackle these trade-offs. Most recently we negotiated and agreed on *Principles for responsible investment in agriculture and food systems*, which represent the first global consensus on defining how investment in agriculture and food systems can merge profitability and sustainability. The divergence of views on topics such as climate change, water, genetic diversity, labour rights etc. was vast, but by working together we were able to achieve more than we could have apart. Addressing food security and nutrition has at times been a minefield of polarising debates, when in fact the best solutions are often found when we can combine and build on ideas from across the spectrum. This doesn't end with just agreeing to what words should be written down on paper as solutions, but in the actions taken afterward. The G20 and the recent 3rd Financing for Development Conference in Addis have taken up the *Principles for responsible investment in agriculture and food systems* as one of the foundations for their work to facilitate not just more investment but better investment.

What we often find is that our objectives are similar, it is our approach that varies. To illustrate my point, over the past few years we've faced a number of contentious issues within the CFS and within the context of the WEF discussions, including access to land and tenure rights, the role of biofuels, rights related to genetic resources, and the role of advanced technologies like drones for precision agriculture. In each case, the diversity of viewpoints and subsequent debate and decision-making has created a new more durable solution than one developed unilaterally.

To use the tenure case, we started from a debate with divergent views that foreign land leases should be capped, big investors were a negative, and on the other side of the table were those who saw investment bringing much needed jobs and know-how. And yet everyone could agree that secure tenure and increased investment were important for both large and small investors. The eventual result was globally agreed guidance on improving the security of tenure –the *Voluntary guidelines on the governance of tenure of land, fisheries, and forests* – thereby providing security for farmers to invest in yield improvements, banks to lend to smaller actors based on land titles to serve as collateral, and larger investors understanding the risks of operating in areas

with communal or customary tenure. Since the CFS agreed on these guidelines just three years ago we have witnessed powerful partners come together, to work at seeing them take form in the laws and policies of actors like the World Bank and Coca Cola. We've also seen civil society organisations develop capacity-building materials, to facilitate greater understanding of land rights and land transactions among rural communities. Bearing in mind that these guidelines aim to achieve long-term behavioural change, this is tremendous success in such a short period.

Increasing the opportunities, like we have in the CFS and WEF, and that we have here today, to face challenges together, listen to various approaches, and debate what solutions may work best is the recipe for sustainable food systems for the future.

So what does this all mean for Australia?

As I started out by saying today, Australia and the Netherlands have learned similar lessons in the challenges that we've faced. However, Australia occupies a unique position as a mature economy, with a strong agricultural sector, surrounded by developing countries in a region with many emerging economies where food demand is expected to double. Australia's future is intimately linked to broader events in the world.

As we reflect on the lessons that I've outlined here today, I would encourage Australia and Australian stakeholders to continue to apply these lessons in turning the challenges of today into opportunities:

- *More responsible and nutritious food systems:* Australia is unique in that its main trading partners are both developed 'rich' economies and emerging economies. This presents an opportunity that while identifying how to produce 'more' to export to meet the growing demand, that there is also an opportunity to create 'better' products. This would position Australia to respond to the growing consumer demand for more responsibly produced and more nutritious products in richer economies, while identifying how this model can also be translated to more developing economies. The Pacific, for example is already demanding more nutritious imports as they struggle with growing non-communicable diseases such as obesity and diabetes. If Australia is willing to invest in a long-term vision, there is the opportunity to gain first-mover status particularly in these emerging economies.

- *Growing youth unemployment and the aging agricultural workforce:* Australia's growing youth unemployment crisis with about 400,000 youth out of work and not in school, presents an opportunity to engage at the global level. There may be a tendency to think that the problems discussed in Europe or Africa are not Australia's problems, and yet, youth unemployment and the aging agricultural workforce are shared globally. I would encourage Australia to contribute the lessons learned in confronting this crisis and to take advantage of the solutions being discussed at the global level, such as the use of information and communications technologies to encourage youth to serve as drivers of change and remain in the agricultural sector.
- *Water and climate change:* Australia has confronted drought and water management issues for hundreds of years. As a result, significant knowledge and innovation have been developed here that could benefit countries who are just beginning to confront these challenges as a result of climate change and growing demands for resources. There is a tremendous opportunity to export this knowledge, technology and experience and for Australian businesses to help build the capacity of others.

As we're gathered here today to discuss how to achieve sustainable intensification where sustainability and profitability are inextricably linked – I have to say that in many ways we've already answered our own question. There can be no sustainability without profitability. And profits will only be sustainable in the long term if they are achieved responsibly.

Food and agribusiness have an enormous impact on every aspect of our lives – environmentally, socially, and economically – a \$5 trillion industry which represents 10% of consumer spending, 40% of employment, and 30% of greenhouse gas emissions globally. Actions taken or not taken in this sector will make or break how successful we are at sustaining ourselves into the decades to come. It will take ambitious game-changing action by all of us.

The game-changers of the last decades – those who have transformed a sector or disrupted the business as usual – have all shared a few key traits: 1) exposure to diverse groups of people and diverse thinking; 2) a willingness to venture outside their expertise; and 3) an ability to reduce a problem to its essential characteristics to target actions. Let us all become game-changers by

exposing ourselves to more multi-stakeholder debate and collaboration, and finally disrupt the trend of hunger and malnutrition forever.

Since 1 July 2011 H.E. Gerda Verburg has been the Netherlands' Permanent Representative to the UN food organisations in Rome (the FAO, WFP and IFAD). She was elected Chair of the Committee on World Food Security (CFS) in October 2013 and, since 2014, is also chairing the Global Agenda Council on Food and Nutrition Security of the World Economic Forum. From 2007 to 2010 she was the Dutch Minister of Agriculture, Nature and Food Quality. In 2007-2008 she was Chairperson of the UN Commission on Sustainable Development (CSD). CSD's theme that year was agriculture, food security and climate change; it reached a broad consensus on these issues, thus laying a basis for the elaboration and implementation of policy on climate-smart agriculture.

Opportunity, challenges and stamina – an operational experience in Indonesia

Lim Jung Lee

President Director of PT Syngenta Indonesia and Board Member of PisAgro
(Public-Private Partnership in Sustainable Agriculture)

Abstract



The alignment of strategy and vision between government and member organisations in PisAgro is an important foundation to achieve market based *Thought Leadership* via an inclusive model. In practice, however, working across a large group of multi-stakeholders with different ideologies, working cultures and agenda is challenging.

As projects progress from simple pilots to scale ups, the complexity of managing these projects increases, adding more pressure on limited management and field resources. In order to ensure scale-up sustainability and addressing project implementation complexities, the inclusive culture of leveraging strengths, expertise and sharing best practices of partners, have to be inculcated. Lastly, in the longer term, there must be continuity of strong leadership in the public and private sectors to drive the food security agenda. At the operational level, there must be stamina to complete the journey, supported by the courage of parent companies and donor organizations to continue to invest in market based opportunities to achieve crop productivity gains, farmer prosperity and environmental sustainability.

Alignment of strategies

Food security policy and objectives are formulated by the government. However, it takes concerted effort by all parties involved in food production to ensure that the government's vision of food security is achieved. The first step in ensuring food security for a nation is to align strategies by all players in the industry to meet the government's vision (Fig. 1). It is also important to note that the private sector and NGOs need to build their food security objectives around the strategies of the government and not vice versa.

The Indonesian Government has ambitious food security plans and aims to achieve self-sufficiency on rice and corn production in three years. PISAgro was founded in 2012 to provide an innovative, multi-stakeholder model for addressing the agricultural challenges of the nation. PisAgro is a voluntary organisation and its success is primarily

Figure 1. Alignment of strategy.



driven by private sector business leaders who are passionate on its 20:20:20 vision (which is 20 per cent increase in yield, 20 per cent increase in income, 20 per cent reduction in emission gas) to achieve crop productivity, grower prosperity and environmental sustainability.

In 2013, Syngenta launched its *Good Growth Plan*, which has six specific commitments to address critical challenges the world faces in feeding a growing population. These six commitments mirror the visions and aspirations of both the government and PisAgro in achieving food security and sustainable food production. In the PisAgro Corn productivity project, PisAgro, Syngenta and other private sector companies take direction from the government and successfully align strategies to meet a common objective. When all these organisations are aligned, implementers at operational level are able to go out into the field to participate actively in the projects. This will also allow implementers the freedom to steer the project, innovate and to take on challenges.

Opportunities

From a business point of view there are vast business opportunities in Indonesia. There is 45 million ha of agricultural land and a wide range of

crops are cultivated. Productivity in the majority of these areas is low. For example, the Indonesian national average corn yield is 4 tonnes per ha compared to more than 10 tonnes in the Americas. Adoption of high-yielding hybrid varieties is only about 65% on the 3.5 million ha of corn in the country.

Business opportunities are the main driver for the private sector. In Indonesia, Syngenta participated in four projects under the PISAgro umbrella (Fig. 2). There are clear business objectives for each of these projects. In the first project on cocoa, the business objectives are about extending market leadership and progressively improving the market-share in this sector. These can be achieved via a farmer outreach program that focuses on education and training, on adopting high-yielding clones, improved cocoa quality and productivity.

On the second project on coffee, the business objective is about developing a new business on a new crop. On the third project on corn, the objective is to expanding our market share and establishing new geographical footprints. There are clear advantages being a 'first mover' and establishing a brand in a new geography for future growth. In the last project on mangoes, the objective is to re-focus and revitalising the business in the fruits sector.

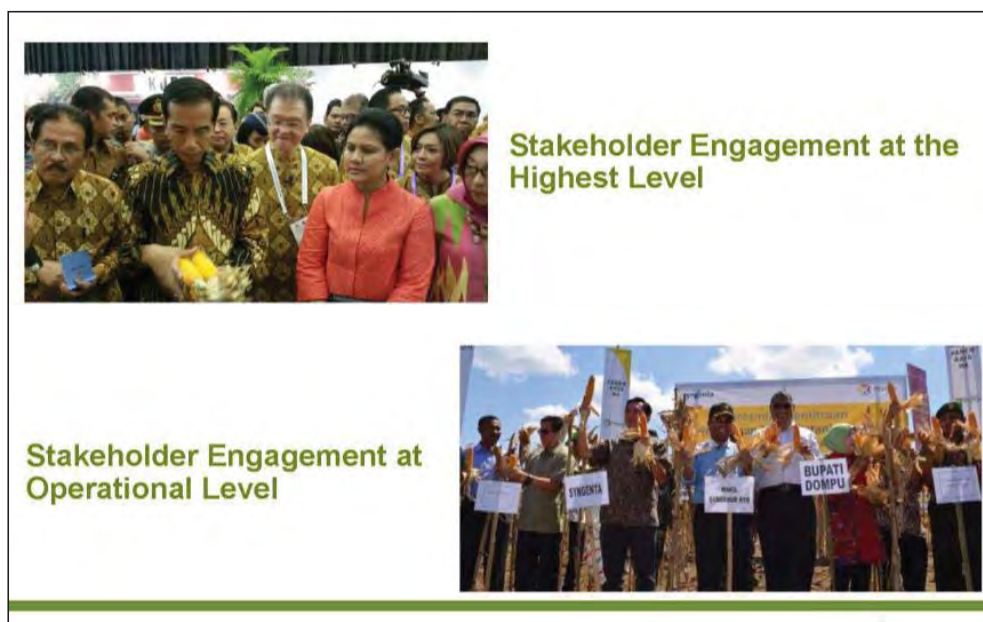
The secondary opportunity that arises from PisAgro projects is government stakeholder engagement and to achieve thought leadership in food security. Under the PISAgro umbrella where there are strong links to government stakeholders, vast opportunities exist to showcase best practices and achievements to engage government stakeholders in Indonesia. Such engagement can reach the highest level in government hierarchy, i.e. the President of Indonesia (Fig. 3).

It is also important to note that the administrative system in Indonesia is decentralised. As such, engagement with local provincial governments is a very important platform to ensure success commitment in local communities where partnership projects are implemented. Clearly, under these partnership programs there are ample opportunities to work closely and build relationships with local provincial governments.

Figure 2. Developing business objectives.



Figure 3. Thought leadership.



Challenges

There are three key challenges in inclusive projects. The first is 'inclusiveness', the second is the need to experiment with unproven business models, and lastly, the ability to leverage and resource the projects.

'Inclusiveness' is a new terminology in a new business model that is not well understood. It can be frightening since it requires all parties in the public and private sectors that are associated in a food production chain to work together. Inclusiveness also means that all members of the work group are required to work under the 'consensus culture', with each member taking an equal responsibility to execute tasks under a common objective. Working across multi-stakeholders and multi-partnerships for a common goal is a challenge. This is mainly due to the fact that different organisations have different ideologies, working cultures and agendas.

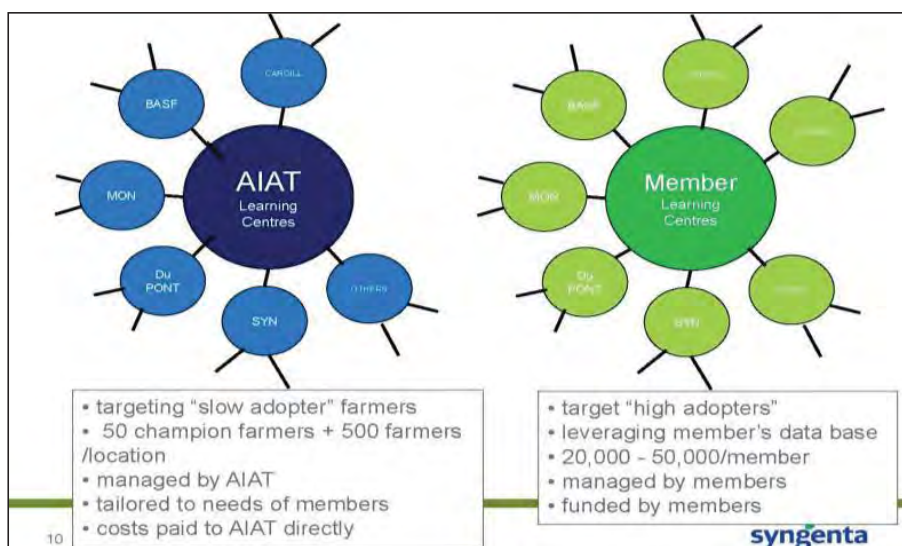
To overcome this challenge, it is best to segment the potential partnership population and to target the right segment for eventual partnership. From personal observations, the population that is involved in food security can be classified into three categories; the first category is the 'believers'. This group of people is the more passionate on food security and members are committed to make a difference on grower prosperity. The second group comprises the 'idealists', who are driven very much by their personal beliefs and strong perceptions. Because they have strong ideologies and beliefs they can be inflexible and difficult to work with. The third group are 'NATO' (No Action, Talk Only), which simply means that these people will only provide lip service. Clearly, it is important to choose 'believers' as partners in inclusive projects since the passion and commitment will ensure the success of partnership projects.

Inclusiveness also means that there is a need to work with competitors. By design and by training, competitors are trained to outsmart and out-compete each other. There is a Chinese proverb that says: 'There cannot be two tigers on the same hill'. This proverb clearly describes what happens when has two or more competitors are group together and operate in the same territory and business. The question is, can we

promote inclusiveness amongst competitors? How can we share information and can we leverage on each other's strengths?

Four or five years ago when the PisAgro corn project was initiated, there was very little experience with the Public-Private Partnerships model. A two-prong approach was adopted and the objective was to reach more farmers in a short time. The first prong was to be led by the extension service. The second prong was to be led by the private sector, which mainly comprised of competitors in the input industry. The first prong was doomed to fail because it was the wrong partner. The second prong was also doomed to fail because there were too many tigers on the same hill (Fig. 4).

Figure 4. Failed experiment – two-prong approach to reach more farmers.



Simplicity makes for a good basis

Simplicity is the basis for a successful partnership program. As the saying goes: 'A rolling stone gathers no moss'. A rock that is solidly embedded on the ground surrounded by water, nutrients and positive energy cultivates healthy mosses. Simplicity in partnership programs means having a common objective, no hidden agenda, choosing to work with 'believers' and having clear roles for each of the partners (Fig. 5).

This is clearly demonstrated in the mango project that was started in 2014. This project aims to increase farmers' income by introducing technology and knowhow to induce early fruit production in the off

Figure 5. Simplicity is the key to its success.



season. Within one year of project initialisation the project reached 8,000 farmers and increased farmers' income fivefold (Fig. 6). It is simplicity that drove the success of this project. The vision and objectives are clear, all six partners are committed and each partner has a clear role. Every partner leverages on each other's strengths and together implements our action plans to ensure the objectives are met.

Figure 6. Indicators of success.



In a second case study on the corn project, which after an initial year's struggle with partnerships, the two-prong model was terminated (Fig. 7). A more simplified structure has been put in place. Partners in the project have been revised with 'believers' working on the project. To accommodate competitors, it is important to create space or territory of operation, so each competitor can focus their energy in the project. This was achieved through sub-committees giving competitor the flexibility to implement their own ideas and action plans. Common information and best practices can be shared.

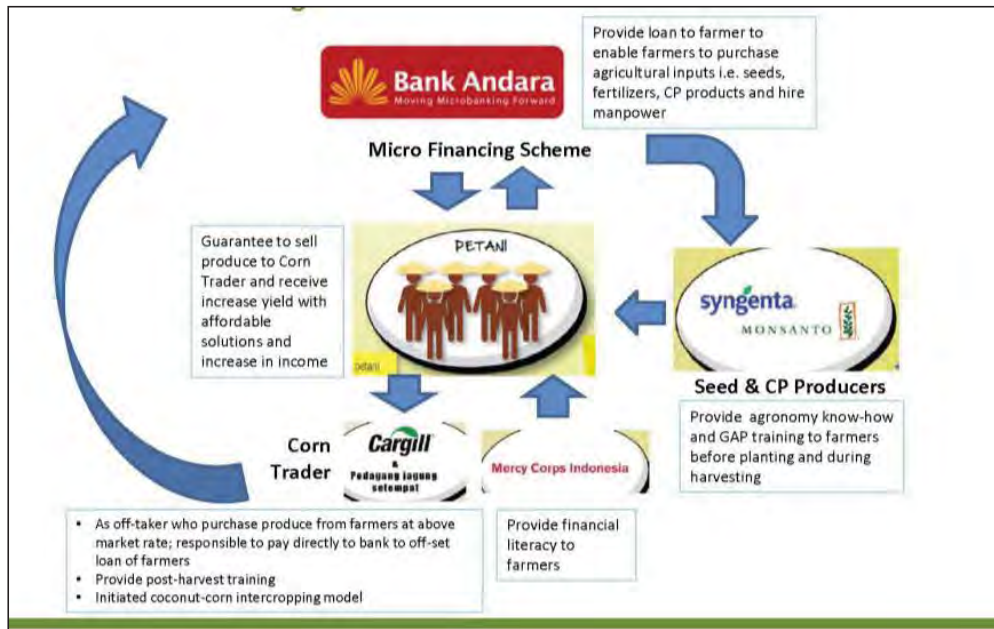
Figure 7. Year-to-date achievements.



An example of success with this best practice in the corn working group is on micro-financing (Fig. 8). This is a new financial tool in Indonesia, which is fraught with many unknowns and challenges. However, both Monsanto and Syngenta believe that micro-financing is an enabler for wider adoption of agricultural technology in Indonesia. Monsanto piloted its first micro-financing model in East Java while Syngenta piloted another micro-financing scheme in Nusa Tenggara, East Indonesia. Since this business model is untested, there are many lessons needed. At each stage of the implementation, ideas were shared and

models were re-tested. The end result of learning from each other was two successful micro-financing models.

Figure 8. Corn microfinancing model.



Stamina

Imagine ourselves, instead of sitting in this room, we are now running the 46 kilometre marathon. In the test for endurance, stamina is the key to achieve the final goal. Similarly, a successful conclusion of a Partnership program requires stamina. As projects progress and scale up they become more complex. More resources will be required. Partners must continue to be motivated and energised. In the mango project there are 8000 farmers today but the scale up target is 350,000 farmers in 5 years. The corn project has reached 200,000 farmers and the final target is five million farmers by 2020. While the scale-up numbers look ambitious and challenging, the private sector will look at the scale-ups as business opportunities. Business is about taking the challenges and resolving the complexity.

Conclusion

Life is a journey. Transforming the life of a farmer for the better is an even tougher journey. This journey, however, can be more pleasant if partners work together to remove the obstacles along the way and by

pulling resources together. This is the new inclusive model of partnership for a better mankind.

Dr Lim Jung Lee is the President Director of PT Syngenta Indonesia (2010–present). Previously, he was the Country Head for Syngenta Crop Protection Sdn Bhd, Malaysia (2007–2010), and the Head of Lawn and Gardens, Asia Pacific, Syngenta Singapore (2003–2007).

Dr Jung Lee has 34 years of experience in the agriculture industry; spending about 10 years in Research and Development; published more than 35 papers on new findings in crop protection and crop productivity; more than 20 years in Marketing, Business Management & General Management; including four years in regional role in Asia Pacific (Asia & Australasia). Dr Jung Lee is the Founder and Board Member of PisAgro (2011–present); Chairperson of the Malaysian CropLife and Public Health Association (2000–2004); and President of Malaysian Plant Protection Society (1996–1997).

He completed his B.Sc (Hons) in Biology – Entomology at Universiti Sains Malaysia, Penang (1979) followed by a post-graduate diploma in Applied Parasitology and Entomology, Institute for Medical Research, Kuala Lumpur in the same year. He obtained his PhD in Biology – Entomology at the Universiti Sains Malaysia, Penang in (1995).

Animal source foods and sustainable global food security

Jessica Ramsden

Corporate and Government Affairs Manager ANZ, Elanco Animal Health

Abstract



The development and adoption of new innovation in livestock production (including products, practices and genetics) can help farmers produce more food, more sustainably. Conservation organisations, among others, are calling for the need to freeze the environmental footprint of agriculture, particularly animal agriculture. In so doing, food can also be kept more affordable. This is an achievable goal. For example, with existing innovations, such as improved animal welfare, nutrition and genetics, we can raise the average annual increase in global milk yield from 13.5 litres/yr/cow to 24 litres. Realising this potential involves a combination of commercial opportunity, corporate responsibility and responsiveness to post-farm gate consumer dynamics. It also requires predictable science-based policy to support innovation across diverse production systems, and to facilitate global food trade.

Distinguished guests, ladies and gentlemen, you might notice that the name on the slide is not Jessica Ramsden. Sameer Bhariok sends his apologies for today, his father was taken ill and hospitalised over the weekend so he was unable to travel to Australia but asked me to present this on his behalf.

Elanco Animal Health is a veterinary medicines company. It was founded by Lily in 1954. We have around 7000 employees in 70 countries. Elanco got involved in the food security conversation because we understand the problem and we feel that as a food company we have a responsibility to be part of the solution.

As you well know by 2050 our population will grow to nine billion and with that will come a 60 per cent increase in the demand for the nutritional benefits of meat, milk and eggs (Fig. 1). According to the U.N., food security is not only about having enough food but enough food for a nutritious diet. Eggs, meat and milk provide not only proteins containing a wide range of amino acids but also bio-available micronutrients. According to the World Health Organisation (Fig. 2), one out of three people in developing countries suffers from vitamin and mineral deficiencies that cause stunting, blindness, anaemia and

reduced immunity, especially among children; these include minerals iron, zinc and calcium, and vitamins A, D and B₁₂.

Figure 1. Food security realities of today.




Figure 2.
Reasons

for including animal-sourced foods.

Key nutrients in animal source foods

- Animal source foods add key nutrients when supplementing a rice diet:
 - Protein, vitamin B12, zinc, iron, calcium, Vitamin D


Chicken



Milk



Eggs



Source: USDA SR-21.

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So how do meat, milk and eggs help to meet those micronutrient needs? Well one serve of chicken provides protein plus vitamin A, vitamin B₁₂, zinc and iron. Each serving of milk can supply substantial amounts of protein, vitamin A, vitamin B₁₂, zinc and calcium (Fig. 3). And egg yolks are one of the few naturally occurring significant dietary sources of vitamin D. Eggs also contain the carotenoids lutein and zeaxanthin, which may help to prevent cataracts and age-related macular degeneration.

Figure 3. Key nutrients in animal-sourced foods.



But while the need for animal sourced foods is increasing we'll have to meet this demand while using fewer resources. According to the World Wildlife Fund it currently takes the earth one and half years to generate the resources that we use in just one year (Fig. 4). And as Dr Fowler said last night and Dr Verburg reiterated this morning, global agriculture will double its requirement of water by 2050 but we're already using 70 per cent of the world's fresh water resources.

So how do we produce more with less? Well for milk the challenge is simple, and despite the current short-term volatility in global milk

Figure 4. Another reality – overusing our resources.



markets demand is outpacing supply. While dairy productivity has doubled in the past 50 years we actually have 14 per cent less milk per person than we did in 1960. But with innovative solutions we can fill the gap between production and demand and freeze the environmental footprint of milk production.

Today on average around the world cows produce about 7.5 litres of milk per day and in high-producing countries they produce around 26.5 litres or more. All it takes to meet this growing demand is for every cow to increase her production by 140 ml a day – that's half a cup (Fig. 5). On our current path with the same productivity and cow herd growth rates we would need to have almost 40 million more dairy cows by 2050. Not only is that significantly more feed and water, it still won't fill the gap between production and demand (Fig. 6).

Applying today's technology

Applying today's technology to milk would have a huge impact on environmental sustainability by requiring 66 million less cows by 2050,

saving significant amounts of feed, farmland and water (Fig. 7). And the types of innovation that can make a difference can be very simple

Figure 5. Trying to fill the milk gap.

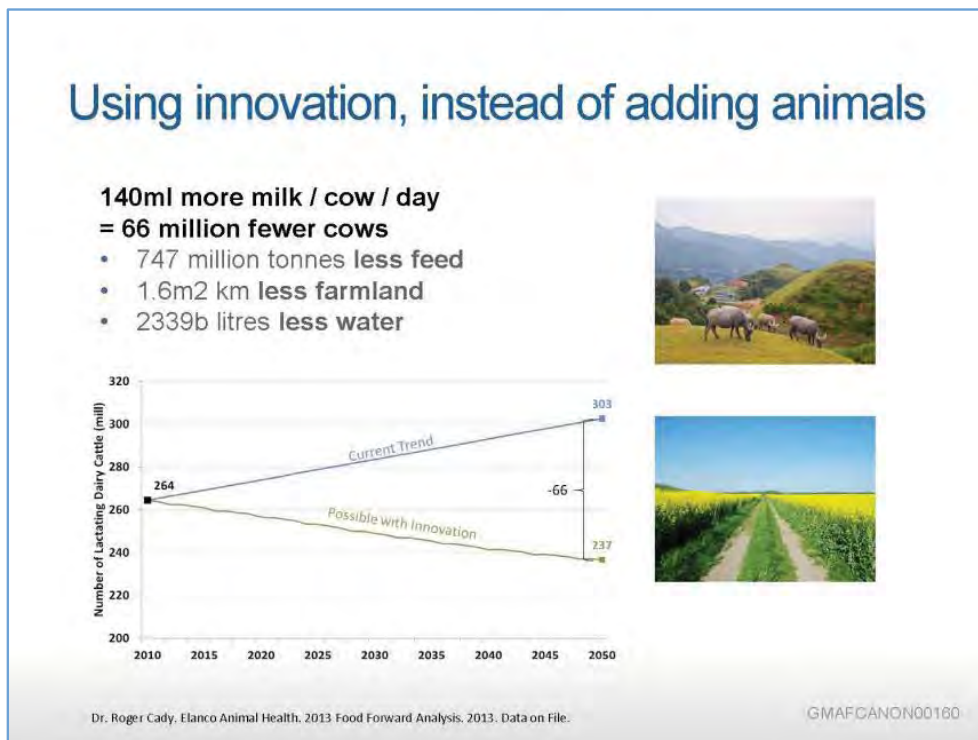


Figure 6. Environmental implications of filling the milk gap.



improvements in animal care, such as fresh water, comfortable housing, better feeding nutrition, and disease prevention and control. And this is one way that animal agriculture can reduce the use of feed for animals – which Dr Fowler mentioned last night as one of the six components of increasing the food supply.

Figure 7. Using innovation instead of extra animals.



The private sector has an important role to play in helping to build sustainable global food security but it does require new thinking – about the innovation that we develop and about how we engage employees, communities and consumers in conversations about food security, agriculture, innovation and trade. Innovation can help to produce food while using less environmental resources, such as through increased feed efficiency and livestock production. It can help to enhance the wellbeing of animals in food production systems, such as through improvement in animal welfare science and handling. And it can help to improve the safety of food through processing, handling and distribution, such as through developments in food packaging and transport (Fig. 8).

Figure 8. Improvements through innovation.



Companies also have a responsibility to engage with and contribute directly to addressing the immediate food security needs of local communities, to engage their employees in the ‘why?’ of what they do at work and to commit time and resources to global and long-term sustainable development initiatives. For example Elanco works with Heifer International, a non-profit organisation that provides livestock tools and training to thousands of families in more than 50 countries (Fig. 9). Animals gifted to a family provide an income and the offspring from those animals pass to the next family together with the tools and the training to help support animal care and handling, and so on and so on to each successive family.

Together with other partners Elanco is working with Heifer on a five-year project to build sustainable dairy markets in East Africa. The East African Dairy Development Project will improve the livelihoods of 136,000 smallholder farmers and their families in Kenya, Uganda and Tanzania. I was talking about this with Dr Persley earlier, and she knows this project intimately, so she could discuss it far better than myself.

Another role of the private sector is to advocate for solutions to global food security. For example, Elanco published *The Enough Report* in 2014. This report doesn't only talk about the 'what' of global food security, it also talks about the 'so what' and the 'now what?' (Fig. 10). So it talks about solutions not just the problem, and it presents information in a way that's easy to digest and to share while trying to

Figure 9. Support for *Heifer International*.



Figure 10. A diversity of ways forward.



engage broader audiences in the conversation about solutions to global food security. Whether we're from the public or private sector or from an NGO or academic community, everyone has an important role to play in finding and implementing solutions to global food security. I sometimes hear that Australia can't solve global food security or Australia won't be the food bowl of Asia, but Australia shouldn't define its capacity to contribute to addressing global food security by the volume of agricultural produce that it can put on a ship. Australia might not become the food bowl of Asia but it can be an engine of collaborative effort to ensure the establishment of policy settings that help to make global food security a reality.

This conference is an excellent opportunity for all of us to better understand and to recommit to our respective roles in this endeavour. I'd particularly like to commend the Crawford Fund Scholar Program for young agricultural scientists and to congratulate the Elanco scholar recipient Tanapan Sukee, a student of production animal health at Melbourne University.

By fostering understanding, connections and collaborations in new ways the scholar program takes this opportunity to find new and enduring solution to global food security to a whole new level.

I am finishing with a video about Heifer International which really goes to the heart of the opportunity we have to solve global food security – and that is to do it together.

Jessica Ramsden joined Elanco in November 2012 as Corporate and Government Affairs Manager ANZ, responsible for working together with business, industry and Government to support the role of technology in agriculture. Prior to joining Elanco, Jessica was Corporate Affairs Manager at Heinz Australia for 5 years where she was responsible for all external and internal communications, issues and crisis management, and Corporate Social Responsibility programs. Prior to Heinz, Jessica spent 10 years with the Australian Trade Commission in various policy and business development roles in Canberra, Melbourne and overseas. Jessica has Masters degrees in Asian Studies (ANU) and Gastronomy (University of Adelaide).

Building yields, capacity and commerce in the developing world

Richard Dickmann

Head of New Business Development, Bayer CropScience, Head Office, Melbourne.

Abstract

Asia is a strategic growth area and Bayer has taken a significant role in many public-private partnerships, including being a founding member of Grow Asia in Indonesia, with CIMMYT in India, NATESC/MOA in China and a broad coalition of groups in Vietnam. Bayer supports sustainable intensification of agriculture via developing and promoting integrated crop production packages. Its *Much More* programs deliver substantial benefits for growers and the community. Significant increases in rice yields and income have been demonstrated across Asia and the program has now been extended to coffee, citrus, integrated shrimp production and other crops.

I'd first like to thank the Crawford Fund for the opportunity to speak to you today. My role is an Australian role and I'm based in Australia, but I've going to talk to you today about Bayer's activity internationally in addressing global food security, with particular emphasis on the developing world.

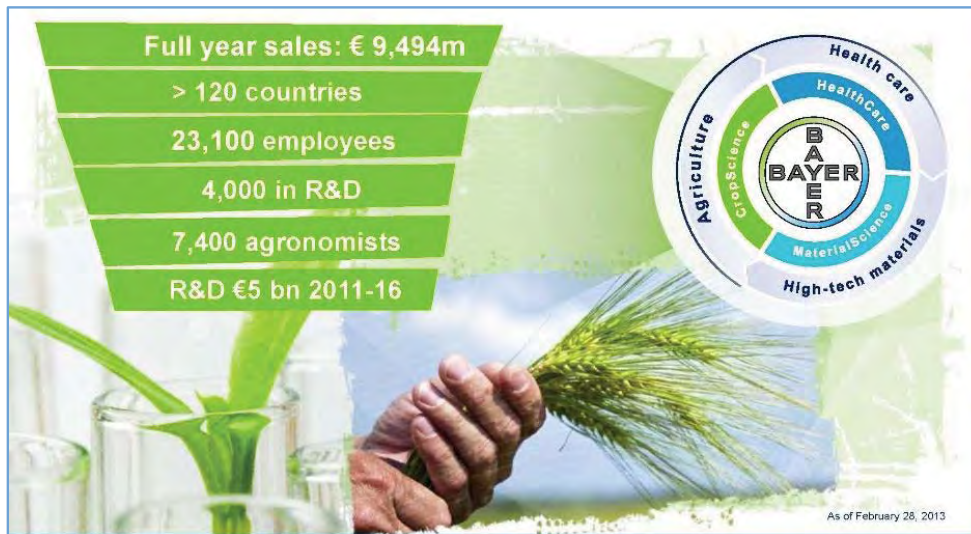
While Bayer's mission statement is 'Science for a Better Life' our focus these days is much broader than just the technologies that protect crops. Through a variety of partnerships we are connecting smallholders to the global market, and addressing skills and capacity shortages which are a problem in most markets around the world.

After a brief introduction to Bayer, I will explain our commitment to sustainability as the basis of addressing food supply and development issues. I will then outline several programs which address in particular, the economic and social pillars of sustainability.

An introduction

Bayer CropScience is part of the large International life sciences company, with a strong commitment to agriculture. We have a strong commitment to R&D with annual spending of around 1 billion Euros. Our 4000 R&D staff have delivered a strong innovation pipeline. These are delivered via 7,400 agronomists operating across 120 companies. As a consequence, our sales have grown to around 9.5 billion Euro, a record for us in recent years (Fig. 1).

Figure 1. Bayer's program statistics in crop science.



Sustainability: the starting point for our business

I would now like to explain how Bayer views sustainability as a business model for addressing food supply challenges and development issues in general. You will all be familiar with the challenges facing global agriculture. Bayer is fully in line with FAO strategies of Sustainable Intensification as a key means of dealing with food security challenges.

One aspect not fully reflected here, however, is the very real conundrum that many of the technologies that underpin sustainable intensification are strongly resisted by certain influential groups in the community. Concerns comes in many forms, from concerns over safety of new technologies, globalisation and the loss of independence and sovereignty.

Whether correctly based or not, Bayer is acutely aware that these concerns exist, and must be dealt with – by re-building trust in the efforts of companies like Bayer, and the agricultural industry as a whole. Bayer believes that sustainable agriculture is the best approach to addressing food security and quality, and to responding to community concerns about agricultural practices (Fig. 2).

Figure 2. Challenges in agriculture – security and quality in food.



Our commitment starts at the Group level, where Bayer is one of the few companies to have been listed in the Dow Jones Sustainability index – for 15 years in row! Sustainability is now fully integrated in our corporate reporting, and in the last report, of the 23 listed Sustainability issues facing Bayer, ‘Sustainable Food Supply’ is the highest ranked of all, being materially important for our customers and the community and also fitting our skill set (Fig. 3).

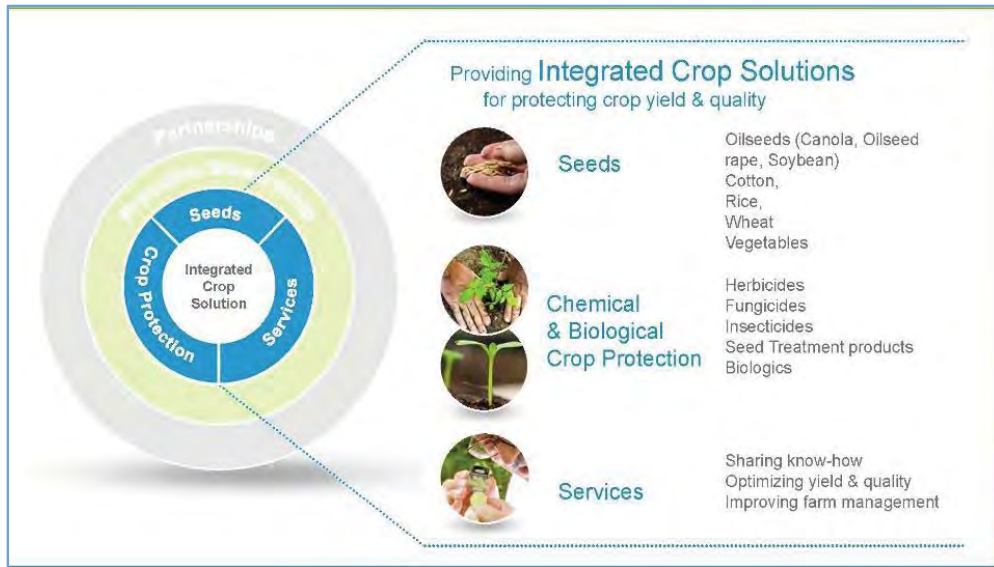
Figure 3. Bayer’s commitment to sustainable agriculture.



Bayer has thus initiated a broad program designed to create better solutions, demonstrate their inherent sustainability, and use our position to help lead sustainable agriculture implementation wherever possible. The front line delivery mechanism for sustainability is our

integrated crop solution (Fig. 4). The last decade has seen a concerted effort to improve sustainability by removing ‘Tox 1’ class products, launching more selective chemicals, boosting seed and traits research and leading the industry into the new area of biological crop protection. A range of services seeks to maximise value capture – both for our direct customers and along the food value chain.

Figure 4. The core is integrated crop solutions.



Partnerships – the new reality

Our activities are underpinned by a deep commitment to product Stewardship, and everywhere, Partnerships – public-private partnerships, private-private partnership, multi-partners, research partners, and business partners. Bayer realises that it no longer can solve all issues by itself, and that lots of people have smart technology, ideas and solutions. As we seek to demonstrate and add value beyond the point of product application, the list of potential players multiplies, opening new partnering opportunities (Fig. 5).

Much More programs

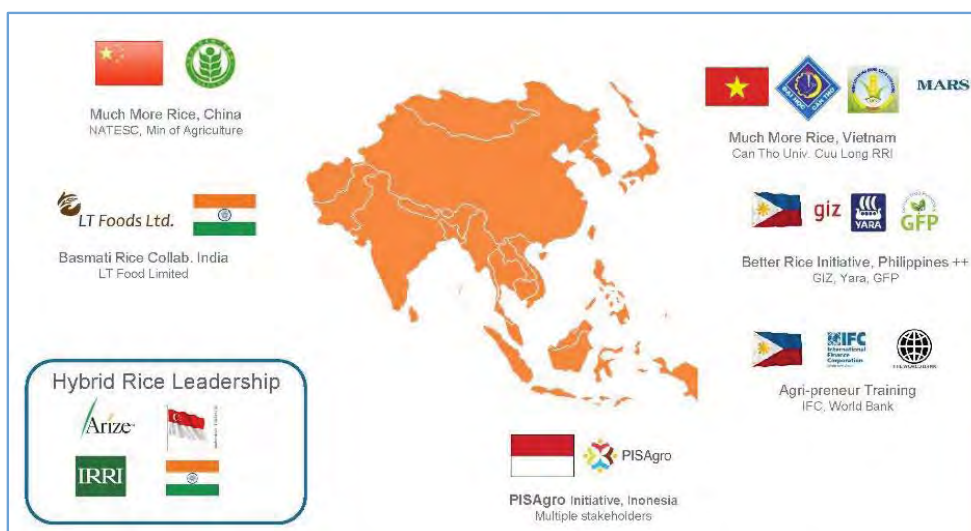
The following examples taken from Bayer’s *Much More* PPP programs give an idea of the range of our partnerships. The first, initiated in Vietnam with rice, is a direct effort to promote sustainable intensification of rice production. While this may seem normal for a company like Bayer, the difference here is the multi-party nature of these programs.

Figure 5. Backing integrated crop solutions with proactive stewardship.



Across Asia, Bayer has partnered with government and academic players to find ways to significantly improved rice yields, through both fundamental research activities and practice change at the farmer level (Fig. 6). More than 1000 trials with a wide range of partners have shown yield increases of up to 20%, driven by better inputs as well as better farmer training and practices.

Figure 6. Collaborations to boost rice output and sustainability.



It is not just agronomy. The Philippines IFC (International Finance Corporation) program trains farmers in finance and business practices while the latest Vietnam projects include international food chain companies, such as Mars, which link growers to global markets. 'Much

More' programs have now spread to a range of many other crops, including coffee in Vietnam and citrus in China.

Bayer Food Chain – linking farmer to global markets

Bayer's Food Chain partnership concept is a proactive approach to meet increasing demand for sustainably produced food. This is a global trend, equally true in Beijing as in Berlin.

By linking players across the food chain, we can create real added value shared between all players in the food chain projects. I want to highlight two examples, one each from India and China.

The Indian Food Chain project is based on simple principle called '5P', which trains, and audits growers in sustainable agriculture practices routinely required by retailers (Fig. 7). This opens up both export and local retail markets, increasingly driven by developed world retailers demanding developed worlds standards.

Integrated programs are developed, based on principles of integrated pest management (IPM), incorporating the best products for the situation. Training is conducted by a system of 'train-the-trainer', products are sometimes supplied and everything is recorded on either a paper or electronic passport (smart phones being now widely available).

As with rice, the objective is to increase the productivity, quality and return for farmers and their customers. The McCormick Hot Pepper project which involves Bayer plus four different organisations has allowed more than 8,000 farmers to meet export standards, boosting reliability and level of income to these growers. In the same way the Reitzel Gherkin project allowed some 27,000 famers, working on some 7,160 ha, to participate in global supply to this major German food company.

Bayer India now has partnership with some 33 key partners across the food chain system. Each, however starts with the growers, who must benefit from the program.

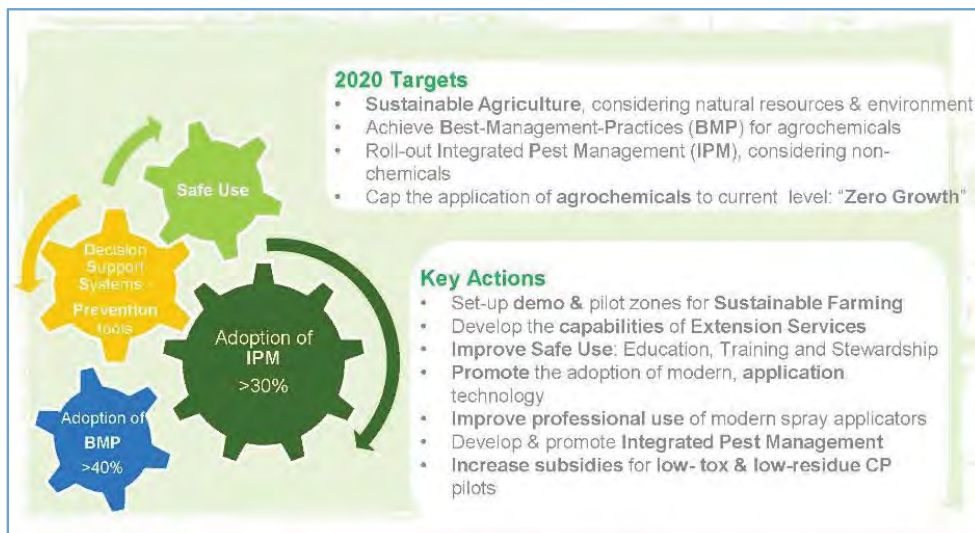
Figure 7. India's 5P process business model.



Activities in China are driven by a dual imperative – a new Ministry of Agriculture ‘zero growth’ pesticide policy, and increasing ‘food chain’ requirements (Fig. 8).

One of our earliest and largest projects included the major supplier and exporter Golden Wing Moa, and the local retailer Haisheng. New markets for apples have opened for some 500 growers. A recent program in tomatoes, with the global companies Uniliver and Agraz, is opening export markets for a new crop.

Figure 8. Approaches in China to meet new food requirements from 2015.



Bayer CropScience China has established similar projects with 35 key players. You will see almost every major multinational and national food

company, reflecting the growing integration of Chinese horticultural markets with world markets. In February this year Bayer celebrated the 10th anniversary of the food chain concept. To date we have established over 240 projects in 40 crops and 30 countries. If you look in YouTube for Bayer Food Chain Anniversary video, you will hear many farmers and food chain actors speaking passionately about what Bayer Food Chain means to them. The majority of these are from the developing world.

At Bayer we believe the Food Chain Partner concept is opening up new opportunities, lifting incomes and building skill sets for small producers across the world.

Youth Ag Education – building capacity around the world

Switching tack a little, I want to move into the social domain. The world of agriculture faces its share of social challenges, but the lack of young bright people entering the field is, as they say, an ‘existential threat to both our agriculture and the whole global community’. Just at the time we need our best and brightest to solve the food supply crisis, they are choosing other professions.

With our international footprint, commitment to science and potential career paths, we believe Bayer is well placed to drive interest in agriculture amongst the young. We have therefore re-organised our various science education activities under a simple platform, called the ‘Bayer Ag Education Program’. This program spans the age groups up to around 30 years of age and is being implemented around the world in different formats (Fig. 9).

In Australia for example, Bayer supports the Sustainable Future Primary School Science program, which reaches more than 300 schools across Australia; the CSIRO Agriculture Vacation program allows 3rd year university students to conduct research with CSIRO during their summer breaks.

But most exciting of all, is the Global Youth Ag Summit Program. The 2nd Global Youth Ag Summit is scheduled to take place in Canberra from 24 to 28 August 2015. From 2000 essays on food security, submitted in 80

Figure 9. The next generation outreach – Bayer’s agriculture education program.



countries, 100 winners were chosen from 33 countries. We are delighted that the developing world is well represented by 38 delegates.

The program will be broadly based with major contributors including the CSIRO¹, WWF², the Borlaug Institute, John Deere, Dairy Australia, Organic Australia and ACIAR³. Apart from a life-changing experience, the key outcomes include a process for setting and tracking personal goals, and a ‘Canberra Youth Ag Declaration’, which will be presented in conjunction with the meeting of the Committee for Food Security in Rome from October 12 to 15.

Our long-term vision for this program is developing, but with help of major like-minded commercial, NGO and public partners we believe this is an excellent opportunity to drive youth engagement and interest in sustainable agriculture as a worthwhile career choice.

Conclusion

So wrapping up, Bayer CropScience is committed to the concept of sustainability and sustainable intensification to address global food security issues. Bayer is committed to a partnership approach to add value both for our direct customers and their customers along the value chain. Our *Much More Food* chain partnership and Youth Ag education

¹ Commonwealth Scientific and Industry Research Organisation.

² World Wide Fund for Nature

³ Australian Centre for International Agricultural Research

programs are designed to make a real contribution to the different pillars of agricultural sustainability via shared commercial interest. Often it's a shared commercial interest, but nonetheless it delivers real benefit – with particular benefit for the developing world. Thank you.

Mr Richard Dickmann is the Head of New Business Development at the Bayer Head Office in Melbourne. Bayer is a global enterprise with core competence in the fields of health care, nutrition and high-tech materials. Bayer CropScience, a subgroup of Bayer AG, is one of the world's leading innovative crop companies in the areas of crop protection, non-agricultural pest control, seeds and traits. The company offers a range of products and extensive service backup for modern, sustainable agriculture and for non-agricultural applications. It has a global workforce of 20,700 and is represented in more than 120 countries.

MORNING Q&A SESSION

Facilitator: Ms Catherine Marriott, ACIAR Commissioner and Managing Director of Influential Women, including morning speakers, structured around direct questions from the floor

Facilitator: So I'd now like to invite questions from the floor, and if we could please as you say the question give your name and where you're from to give a bit of context behind that question and keep your questions quite short so that we can pull the most out of the panel.

I'll start the ball rolling because I'm here with a microphone, Gerda I would love to address you if possible: Anthony Pratt this morning spoke about the need for, like 10 per cent of India's food is processed and it's important to decrease food wastage by processing food. Something I'm really passionate about is the debate around calories versus nutrition, and I was wondering if you could shed some of your thoughts on that?

A. Gerda Verburg (panel): Well I think both is necessary but in a balanced way. And until now we apparently have been thinking too much and focusing too much on calories and giving less attention to nutrition. So nutrition is everywhere right now. Last year in November we had the second National Conference on Nutrition organised by the Food and Agriculture Organisation of the UN and the World Health Organisations. Fine, and now the focus is on nutrition. But there is a little misunderstanding here in my view; many people tend to think that nutrition is something that has to be added to food and I think we should start with investing in nutrition-sensitive agriculture. Well I think both are necessary, both can be reached and both are crucial for a 'healthy and not hungry anymore' world.

Facilitator: Thank you. Who have we got up there? Yes, Tim Fischer.

Q. (from the floor): Just a brief question, of course many of us would have liked to have questioned Anthony but that was a good comment you made on Anthony Pratt. Tim Fischer. To our friend from Bayer Richard Dickmann, it's an obvious point but in all of this we need to trumpet the messages out to the great beyond within Australia and indeed Asia and beyond, food security and the like. With your conference in two weeks' time presumably do you have and if not will you have a media plan? I mean you could invite Donald Trump (I think not) to trumpet the message. But it's terrific that you are committing to

bringing these young leaders, as indeed Crawford has, and I just would urge that you try and maximise media for that event as well in two weeks' time as Cathy is doing here today.

A. Richard Dickmann (panel): Yes, Tim there will be an extensive media plan and I mean we're very proud of having it here in Australia obviously, I mean it was the obvious place to go. The first one was in Canada and we were looking for a place to go and around sustainability our low-input efficient agriculture was really a story that we could tell to these delegates. So we will definitely have an extensive media plan.

A. Gerda Verburg (panel): And they will present results to the CFS in October, which is also a media opportunity I would say, because in the plenary of the committee on world food security we can only have about 1000 participants – but we have a lot more applications just as is the case for side events during that week.

A. Richard Dickmann (panel): Yes, we've been successful in getting the side event, I don't know if you were involved with that, thank you very much. But if we could get two tickets for the plenary that would be nice as well.

Q. (from the floor): Bill Hurditch from Visy. Just a quick comment on the calorie thing, very good feedback actually, I mean Visy's a packaging company and apologies that Anthony Pratt couldn't have stayed to have the Q&A, he had to get back to Melbourne, but my question is to Jessica actually. I was fascinated by your dairy graph, about 66 million less cows with only a small increase, have you factored in or have the people who did that work factored in the attenuation of wastage in dairy, particularly wastage in lots of small dairies? So if you actually improved or eliminated wastage in the dairy cycle would you actually improve those numbers even further?

A. Jessica Ramsden (panel): The way that Elanco looks at wastage is the pre-harvest, so waste is absolutely a critical issue that needs to be addressed. It's often looked at in terms of post-harvest losses but the pre-harvest losses, particularly in developing livestock systems, are significant. So if you can do some very basic things around fresh water, around disease prevention and control and some of those very basic animal care and handling improvements or innovations, that can help to increase the amount of yield per cow and increase that consumption.

So there are some very simple innovations and then right up to some very sophisticated innovations in terms of the high-end feed efficiency tools and things like that.

Q. (from the floor): Thank you, my name's Tony Fischer, CSIRO Agriculture. It's a question to everybody really, there's a lot of discussion about corporate farming in the developing world and also in a sense in the developed world, particularly animal farming, intensive animal industry. I was pleased to see that the multinational people here on the table talked a lot about interacting with small farmers, I think that's fantastic, but I'd like you also to comment a little bit on where you see corporate farming going. I mean it's big in Latin America, it's big in ex-Soviet Union, what about in areas in which you operate? Does it have a role? Should we resist it or should we work with it?

A. Richard Dickmann (panel): Dr Lim I think you would be more on the ground to comment in Asia.

A. Lim Jung Lee: I think the role of corporate farms is very important and also the funds from funding agencies also very important. Now at the operational level we have a pool of funds for investment but then there is a lot of priorities that we need to follow, there are a lot of business priorities and where the funding agencies can come in is really to kick off new business models, to start off new business models. For example, like the project that we're working on, opening up new business in coffee. They're in with funding which again helps to push and to turn the wheel in the coffee business.

In the mango project funds are available to kick up the project which I think has been well received by the farmers and very quickly this will be translated into education and training which then becomes much more sustainable. So I think the corporate funds will continue to invest once this, when we have proven the concept that it can be up-scaled, it can be moved up into business which I think then we will attract a lot of funding internally.

Facilitator: I've got a question up the back but before we do I'd encourage the students, it's an amazing opportunity, you've got four brilliant speakers up the front. And then you sir?

Q. (from the floor): It's Anthony Leddin from Plant Breeders Without Borders. Dr Lee I really enjoyed your talk. I worked a bit in East Timor where when you go over there it's a mecca of aid organisations all working on very similar projects but never the twain shall meet. So it's very interesting to hear about your talk about two large commercial companies working in the sort of same sector in some ways. How can we get to a stage of where you're getting commercial companies that are competitors in the commercial world actually pooling their resources into the one project to the help of humankind, working together?

A. Lim Jung Lee (panel): I think I'd like to go back to this morning's talk. It's about creating the trust, and if the other party does not trust you, you have to trust them first. Now I think in the business world that we are in we are all trained to compete and information is a competitive edge for us. So I think it's very difficult for us to say 'look you know we can share everything'. But the point is here like what I was showing you where Monsanto and Syngenta have a common objective, that is micro-financing. It's on neutral ground I would say. This is something that is new, nobody has any experience and by pooling our resources together we are able to make a move. So if there are other corporates and other companies who wish to join the team I think there has to be a strong common objective. Improving a farmer's income is not good enough, you need to have a more specific objective that can really hold us together.

Now the other point I'd like to point out is in crop life. In crop life various companies are actually working together but they have a very strong common objective, that is to ensure the crop protection and the seeds technology are well received by our end-users and that becomes a very strong objective, it's a common platform, it's a neutral platform and this is where many companies are actually working together. So I'm not saying that it's impossible. In this partnership program working with competitors is possible. We need to trust, we need to be a little bit more flexible and we need to ensure that there is some common understanding.

A. Richard Dickmann (panel): May I just add something, I mean I think the bases of these arrangements are very careful planning and division of responsibilities and expectations of each of the parties, and I would

throw it out there that I mean if Australian aid agencies want to collaborate in some of these arrangements I mean that's also possible. I mean it requires a very transparent discussion about, you know with business partners about what are the objectives and what is the planning and so on. I mean you should also think a little bit about that because I am, for example in the GTZ partnership, this German aid agency is a very extensive partnership involving a number of commercial groups; likewise PISAgro and other extensive collaborations have been set up. So I think we would welcome more discussion with Australian aid agencies as well.

Q. (from the floor): My name is Neil Inall, I'm a very old student! My question is to Richard and maybe some other members of the panel would comment, but Richard very early on in your presentation you put up the words changing consumption patterns. Now I'm wondering if you can expand on that please. Is it only pizzas and Big Macs or is it a lot more than that?

A. Richard Dickmann (panel): Yes, it's definitely a lot more than that! I think we all know that the trend in protein consumption in Asia I think only if they double their protein consumption in China will have tremendous impact on the production of cattle and also production of crops and so on. I mean that's their absolute right, I mean we've been omnivores for several million years and we've got to where we are because of that fact. So I mean you know we have to look at sustainable ways to meet that demand.

A. Gerda Verburg (panel): But if you allow me also from the part of society we should look at it because in some countries you have both people who are undernourished and people who are very rapidly going obese. If the living standards are increasing, you see that people who were in their childhood undernourished start to become obese. So it is something that has to be thought and discussed through by the different stakeholders, because there are a lot of different angles in this question, in this topic, and we need consumer representatives, we need business, we need government and a lot of stakeholders to tackle this very complicated problem of both undernourishment and over nourishment.

Q. (from the floor): Hello, my name's Justin Whittle from the University of Western Sydney. I'm one of the Ag delegates for next week's

conference, which I'm very grateful to be a part of. My question is: young people bear the burden of food, water and energy security in the next 50 years, we talk about innovation and solutions, and one thing I'm very passionate about and will be speaking in two weeks is creating disruptive and sustainable new markets in agriculture. Most of the feedback I've received from many people in the industry has been quite negative towards disruptive agriculture systems. What is your opinion on innovation and disruptive agriculture systems? Thank you.

A. Richard Dickmann (panel): I think the potential, and if we're talking about IT and I mean what is going on in Africa with the ability of farmers to access markets through, what is it Nokia 110 or something like that, that they are able to access these markets is rapidly developing. And I'd like to highlight some of the work of Syngenta in Africa with their underpinning of an insurance program which linked the supply of seeds to weather forecasting; with an SMS the farmer could geo-locate himself and therefore gain insurance for that piece of land.

It's that type of disruptive approach which really can revolutionise activities going forward and we really have to look at that and that's why we need you guys to really think out of the box about some of these things. Supply chains like being able to trace food, Australian food with its high attributes of quality which basically we lose the trace of that when it passes the border, being able to trace that all the way through so that we can deliver it to an Asian consumer with all of its associated attributes would be a fantastic.

A. Gerda Verburg (panel): But Madam Moderator, the question is what did these businesses tell you about innovative and disruptive agriculture? Why are they negative and about what facts are they negative? I presume you have asked them, otherwise you should go back and ask them so that you can work on it during your two weeks.

Q. (from the floor Justin Whittle cont'd): Well one of the key things I wrote in my essay was establishing an edible bug industry in Australia to help food and nutrition security worldwide. And I feel in Australia I have got quite negative responses maybe due to conservative views in Australian agriculture. But even seaweed farms for human consumption, edible biogas farms with cactus and prickly pear, these kinds of

innovations that I like to see happening but I still get the door slammed in my face most of the time when I enter these ideas.

A. Gerda Verburg (panel): OK, congratulations that you can make it to this meeting. Because it's really necessary to go back because there is a lot more to learn, there are much more edible plants and flowers than we use right now and they are also enriching let's say resources that we can use. Edible insects for instance, well to be honest I do not eat them right now. But I'm sure they are the future is and it's very encouraging what kind of possibilities we develop. So train yourself or get trained to go back to these kinds of businesses.

Facilitator: Just quietly I think Jess and Dr Lee have got a brief comment and then we'll go to the next question.

A. Lim Jung Lee (panel): I think you have a bright idea and if doors slam in your face you should continue knocking, you must not give up. Because ultimately a door will open for you and your ideas can be put into practice and with the help of some of the funding agencies, with a group of partners, you could get things going.

(No comment from Jessica Ramsden)

Facilitator: Next question please, up the back.

Q. (from the floor): Justin Borovitz from the ANU. I wanted to go back to Tony Fischer's question a little bit, first about corporatisation of agriculture. There's been a lot of discussion focused on the small farmer and improving yield gaps and access to markets and as we think about the future nine billion, six billion urbanised. Feeding the cities is the big draw and so if the path to development is for small farmers to stop being so inefficient, adopt new technologies and export to make revenue then how do they provide food security for themselves? I think we sort of are forgetting that the smallholder farmers are also food insecure. So it's sort of a contrast anybody could comment on about are we trying to be more productive and improve gaps or is the goal to provide food security for the people that need it most?

A. Gerda Verburg (panel): If you allow me, I think it's, I'm very happy that you've come forward with this question because indeed we talk a lot about smallholders and that smallholders have to increase production and to improve production, to improve income. But we

never, never can do without family farmers, also the bigger family farmers and if you, I don't know how you call it but it's sometimes named commercial farming. Well my brother is still on our family farm and he's a commercial farmer but indeed he's a family farmer. Sometimes we talk about farmers as if they are an endangered species, well to a certain extent this is the case but they are business people, they like to get support to get things done like access to land or the opportunity to buy the best seeds or the best fertilisers to organise their interests etcetera.

But we should consider them as business men and women and give them the opportunity to develop themselves because one of my questions to Dr Lee would be: 'OK 'til when do you support farmers etcetera and when do you invite them to work towards the future on their own feet and to organise their own interest?' Mr Pratt was talking about you can deliver fish but you can also teach people fishing. OK when the moment is that people are able to do the fishing and to present their interests themselves. This is extremely crucial but I agree with you we never should think that we can depend on only smallholder farming, not all smallholders are food insecure but too many of them still are.

A. Jessica Ramsden (panel): I think the important thing is, just to reiterate that it's not an either/or scenario and it can never be. So we definitely need all types of farming system, all sizes of agribusiness, any size of business whether it be corporate or smallholder can be sustainable. Any type of food production or livestock production system can have good animal welfare outcomes. So, and just to loop then back to the question about doors being slammed in the face of new innovation because they're a little bit icky, it reminded me of a dairy farm in the US called Fair Oaks which has 37,000 cows, they're all in, it's a factory farm I suppose, they're all housed, they use, they capture the methane which powers the trucks that takes their milk to market, they process 100 per cent of the effluent that's produced from those 37,000 cows, break it down into those individual nutrients and reuse them on the farm or sell them as ingredients into other processing chains. And they also, they're open to the public so you can do tours, you can watch the 140 calves being calved every day in a public auditorium like this, to see the cows being born.

Now the important thing about that is that they are building trust and transparency in farming and about livestock agriculture and about intensive corporate agriculture. And so it's that trust and transparency in the big company which is where we need to start innovating a little bit more so that people don't continue to slam the door in the face of some of those innovations that can play such an important role in sustainability and animal welfare.

Facilitator: We've got about 10 more questions and 15 minutes so we'll move it on. We've got two up the back, one down the front, one there, one there, one up the back! OK, wonderful, away we go.

Q. (from the floor): OK, so I think I cannot have two questions then! For Richard: in China, in the developing areas like in the southwest Yunnan province with the terrace fields, there are many sustainable, traditionally sustainable ways of using the traditional crop varieties where you put the seeds on the roof shelf, that's the method you have sustained for about 5000 years. So like the new powerful, like your company, I mean when you incorporated with China's government local ones have you considered how you deal with the traditional ways of, I mean that have sustained for many thousands of years?

A. Richard Dickmann (panel): I can't comment directly on what's been done in Yunnan with those traditional crops but I know well China and its regional specificities, in particular Yunnan. So you know I mean we've signed these national deals with NATESC and with MOA and so on, but you well know that in every province sub-deals have to be signed and the project has to be set up really province by province. So I hope, and I can't comment, but I assume that the correct approach has been taken in Yunnan to respect those traditional approaches.

Q. (from the floor): Robyn Alders from the University of Sydney. Thank you for your presentations this morning. You mentioned this morning the important of nutrition-sensitive approaches to what we're doing and so I would like to hear the panel's thoughts about the importance of involving human nutritionists and physicians in these discussions. If we're going to have efficient use and efficient nutrient cycles then we need to be able to compare food-based approaches to nutrition from supplementary feeding. Work on microbiome studies that have been done suggest that if you tried to supplement by just giving sprinkles or

vitamin tablets that you're not necessarily getting the optimum outcomes and you could on some occasions be leading to diarrhoea in children that would cause additional problems. So I'd like to hear your thoughts about how we get the health sector actively involved in these discussions. Thank you.

A. Jessica Ramsden (panel): Absolutely, in terms of involving the human nutrition community in discussions about animal production and the role of animal foods in the diet, I think that's a very important area and there's been some work that Elanco's been doing with the Academy of Nutrition in the US to help support broader education of human nutritionists about agriculture and innovation in agriculture and the role of sustainability.

I'm not sure that this is answering your specific question but it's an interesting area. A lot of human nutritionists are asked questions about farming practice or a lot of chefs are asked for nutrition advice and so on. So there's a lot of opinion which is asked of people who don't necessarily have those particular qualifications, so the more that we can share insights across the animal nutrition sector and the human nutrition the more we'll get some common understanding.

I was speaking recently with Dr Malcolm Riley who I think is here today, the President of the Nutrition Society of Australia which also includes animal nutritionists – which was a surprise to me but a pleasant one – so I think there's an opportunity for some greater dialogue between animal and food nutrition about how to address some of those issues.

A. Gerda Verburg (panel): We need nutritionists more than we realised before, and they are really engaged in the International Conference on Nutrition that was held in November last year. But let me make three remarks and probably three requests; my first request is when it comes through the health department be ready to open up for a multi-stakeholder approach because what I noticed is that health is extremely difficult to open up and to have multi-stakeholders involved. My second point is nutritionists please come forward also with concrete proposals for nutrition-sensitive agriculture improvement, because we really need this and we can do a lot more but we need your input there as well.

And thirdly my experience, my personal experience and I apologise for it, but my experience is that we need nutritionists that are also able to

move forward, to be movers, shakers, operators etcetera and make things happen. Around the conference I've seen a lot of excellent nutritionists disputing amongst themselves without any output that was very helpful for us negotiators to come to the best outcome. So if I may make that plea Madam please take it also on board. Thanks.

Q. (from the floor): I have a follow-up question for Richard, I wonder in your experience have you found involving government agencies in private sector driven projects speeds things up or slows things down?

A. Richard Dickmann (panel): Can I pass (laughs)? I think certainly five to ten years ago it was very difficult, but I think there has been a big shift in approach around the world and things are improving dramatically. I mean it still presents some challenges but, and it's funny in a way, working with competitors it's interesting when you really start to discuss there are so many things that we are united on that you can really work on and we have a similar mindset; you know results in a certain short period of time and so on. Whereas there's different timeframes, political issues that are influencing government aid which does complicate things. But you know, things are improving.

A. Gerda Verburg (panel): My experience is in the beginning it slows down because it takes time to build trust, and you cannot build trust by pulling it together or bringing people together and say I trust you and you have to trust me, no it has to grow etcetera. But in the end it will speed up because once the trust is there you can rely more on each other and you can add value from the different angles and the results you have is more sustainable and durable. So let it take a little bit more time, don't hurry because the result is better.

A. Richard Dickmann (panel): And I'd have to say Dr Lim you mentioned I think yesterday that the need to align anyway business activities in this space with government activities, so we really need to work together. So maybe slow in the start but in the end it's absolutely necessary and beneficial.

Q. (from the floor): I'm a PhD student at Charles Sturt Uni. We are talking about mainly the major crops like wheat which is important for the food security but we are missing the minor crops which might be restorative and two of the tigers of the world represented here. So I'm just thinking that maybe we can, because all these major crops are

exhaustive so they can deplete the soil resources but if we include those minor crops, I'm talking about forage legumes, so they not only produce the feed for the animals which ultimately produce the food for the humans but at the same time they restore the nutrients into the soil. So what do you guys think about that one?

A. Lim Jung Lee (panel): I think again this is minor crops/major crops. The two examples that I highlighted, again mango is not a major crop in Indonesia, it's a minor crop. And in PISAgro we have 11 working groups looking into all kinds of crops, from beans, soy beans, potatoes, vegetables, papayas, rubber. And I think whenever a member comes up with a suggestion and it makes sense and it fits into the PISAgro vision of the 20:20:20 (which is 20 per cent increasing in yield, 20 per cent increase in income, 20 per cent reduction in emission gas) then the board will support this working group to go ahead and implement your ideas.

So I think we have a lot of these smaller crops in place, including tea. Tea is not a major crop in Indonesia but surprisingly tea is one of the crops that is being piloted in Indonesia now. So I think again with good ideas and it meets into the vision, it meets into the food security objectives of the government, everything is aligned, the projects will be supported, at least in Indonesia and the PISAgro.

A. Richard Dickmann (panel): If I can comment at another level, I mean you bring a very important point I mean in the maize/soybean system in the U.S, obviously there's a lot of development in soybeans and you have a wonderful rotation there to bring nitrogen into the system. But there is a lack of fundamental research in these crops elsewhere, I mean that's a major lack in our Australian systems. So it is a bit of a gap in terms of really high levels of investment so it is an issue.

Facilitator: OK, we've got three questions left. I apologise if we're not going to get to everyone. So we've got the gentleman at the front, the gentleman up the back and the gentleman that I'm looking at.

Q. (from the floor): John Angus from CSIRO Agriculture. One of the challenges of using plant and animal protection products is possible development of resistance by insects. I understand that the companies want to retain the activity of their products and delay the development of resistance, the problem is what happens with the retailer services

with the farmer, what can you do to preserve the activity of these products at the level of the agro-chemical retailer?

A. Lim Jung Lee (panel): I think important question. And when we look at the way farmers are influenced, about 30 per cent are actually being influenced by their fellow farmers. So the key farmers become very important. The other 30 per cent actually comes from the retailers, like you rightly pointed out. Now the rest is coming from various extension services and sales promotion and what not.

A good retailer education program is very important. From a business point of view, to reach the farmers you have this point, touch point. One of them is the farmer leader, the other one is the retailers. Educating retailers on judicious use of chemicals, IPM, becomes a key, and I think this is one of the key activities that we have under the umbrella of crop life in Indonesia. So working together, having a program on IPM, educating farmer leaders and retailers. So education is the key.

A. Gerda Verburg (panel): But sometimes you need soft pressure as well. Let me give you the example of the Netherlands, I have been the Minister of Agriculture there and at that time we acknowledged that farmers were using too much antibiotics already, sometimes in the feed to prevent diseases etcetera. We brought farmers organisations together but also the food chain players as well as retailers, and I told them I'd like to have a decrease of the use of antibiotics, I will halve the percentage of antibiotics that is used by three years.

And they were protesting and they said no, no, impossible because this will create less profit etcetera and my animals will be ill etcetera. I said no you can find opportunities and possibilities, Wageningen University was advising me, Utrecht University as well, they came together, it was extremely difficult but they managed without any loss of production. On the contrary the quality of the production improved and the profit improved as well. So since that very moment they saw it as a win/win and at the same time the Netherlands was seen as a good example for Europe as well to empower. So sometimes you have to educate, sometimes you have also to use soft power in order to convince, really to change habits.

Facilitator: So we've got two more minutes and two questions. The gentleman up the back who does not have a speaker, in the meantime we'll go to the gentleman down the front.

Q. (from the floor): Isaac Jones from the University of Western Sydney. My question is for Jessica. There's a lot of pressure on the dairy industry from an animal welfare point of view and also from water usage and things like that and so one of the ideas is to move towards things like almond milk and rice milk and things like that. From a food security and a national perspective is it viable to move towards these sorts of things, given that they can be grown as crops rather than as livestock and things like that, is that a good option to move towards those things or should we focus more on the dairy side of things?

A. Jessica Ramsden (panel): Thanks for that question, it's an important one that often gets asked about whether animal protein is really necessary. And it certainly is possible to meet all the nutritional needs in a completely plant-based diet but typically that would require a very large variety of plant foods in order to meet all those micronutrient needs, and that variety isn't always available to people even in developed countries but particularly in developing countries.

So in terms of livestock production there's already been huge advances in productivity in reducing the environmental impact but there absolutely has to be a lot more of it. And in many cases in livestock production the food that the animals consume, the forage that they consume is not edible by humans or they graze on land that can't be grown for crops.

So I go back to the point earlier that it's not either/or, certainly dairy systems and other livestock systems that do use foods that have been grown as crops need to be more efficient on how to do that but also opportunities, if people prefer to drink almond and nut milks and other things then there absolutely should be that choice and diversity available to consumers, as much as there should be that choice and diversity available to farmers in terms of the types of production systems that suit the environments that they operate in and the market systems that they are supplying.

Facilitator: Wonderful, thanks Jess. Unfortunately, we are now out of time. What a fantastic panel! Please join with me in thanking Her

Excellency Gerda Verburg, Dr Lee, Jessica Ramsden and Richard Dickmann.

INCREASING PRIVATE SECTOR ENGAGEMENT – FOUR DIFFERENT PERSPECTIVES

Partnerships for impact at scale

Marco Ferroni

Executive Director, Syngenta Foundation for Sustainable Agriculture

Abstract



The presentation sets out the rationale, method and best practice of private-public cooperation in agriculture in developing countries and emerging markets. The focus is on product incubation and dissemination at scale through commercial channels to support sustainable intensification, diversification and farmers' access to markets. Much has happened since the Crawford Fund's 2009

conference on the role of the private sector. The presentation assesses the process and identifies gaps and opportunities ahead.

The last time I spoke from this lectern was in 2009. Thankfully the topic of feeding the world is on the agenda again – as it should be – and the topic of partnerships has been central. The topic of partnerships and the terms 'partnership' and 'cooperation', which will be replete in my presentation, have already been mentioned many times – rightly so, for reasons that I will also try to explain in my own way by referring to the world in which I work at the Syngenta Foundation for Sustainable Agriculture.

Food and agribusiness is the theme of the conference. It's represented by companies large and small the world over that have responded to the challenges and opportunities in the world food system with massive investment growth in the last 10 years. Secondly, food and agribusiness of course has a major economic, commercial, social and environmental footprint. And thirdly – and this is the real point that I want to make – is that it offers unprecedented opportunities for the rural sector in poor countries and emerging markets in the context of equally unprecedented food demand growth such as is projected for the remainder of the century.

Tapping into those opportunities and making them come true – in terms of food supply, rural incomes and a number of other dependent

variables and development indicators and so on – requires cooperation across the spectrum of the relevant stakeholders as I have mentioned earlier. A core purpose of this cooperation, and the one that I will be focusing on, is to build the agricultural markets that are absent or don't function well in many settings today. My presentation seeks to elaborate on this with particular reference on input markets and particular reference within that segment on seed markets, why those input markets are needed and how can they be built for impact at scale. I will start with reference to what is by now a classical insight on seed technology and markets in the USA some 80 years ago.

Fig. 1 displays the spread of hybrid maize. In the USA you see the S curves that are typical of successful adoption, whether we're talking about washing machines or improved varieties. I could have shown an S curve for the rate by which farmers adopted zero till agriculture in Western Australia between 1990 and 2010, it would have looked a little bit like some of these, not like the most aggressive one that corresponds to Iowa here but some of the more lagging ones. We've got an S shaped pattern of diffusion which is slow at first accelerating until it reaches a peak and then it slows as laggards enter.

The key aspect here, and that has everything to do with my message about markets, is that in this analysis which goes back to the classical paper by a U.S. agricultural economist (Griliches in 1960), geographic differences in the use of hybrid maize are explained by differences in the profitability of that use and as the profitability spread the seed industry engaged and produced varieties that were adoptable and useful for different agricultural regions. Now we've got exactly the same story much more recently in the case of Bt cotton in India, an illustration of the same phenomenon today (Fig. 2). Here too very rapid adoption, you see the S curve. By 2013, 7.3 million farmers grew Bt cotton on 11 million hectares in India and product developments which were demand-led and market-led (more about this towards the end of my presentation), and availability of locally adapted varieties were key in this episode.

Figure 1. Spread of hybrid maize in the USA, 1936–48.

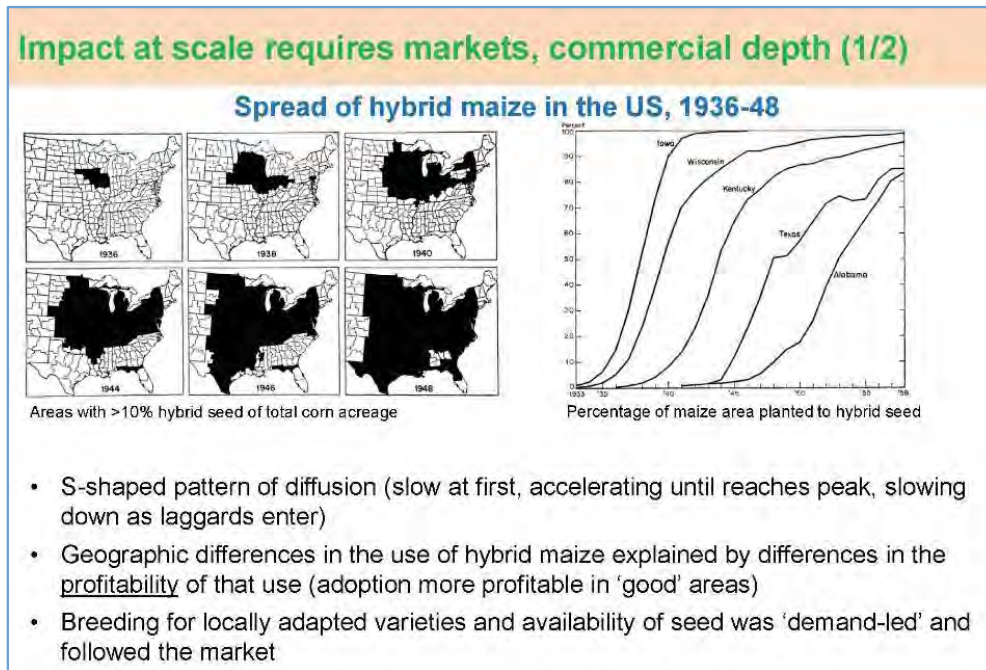
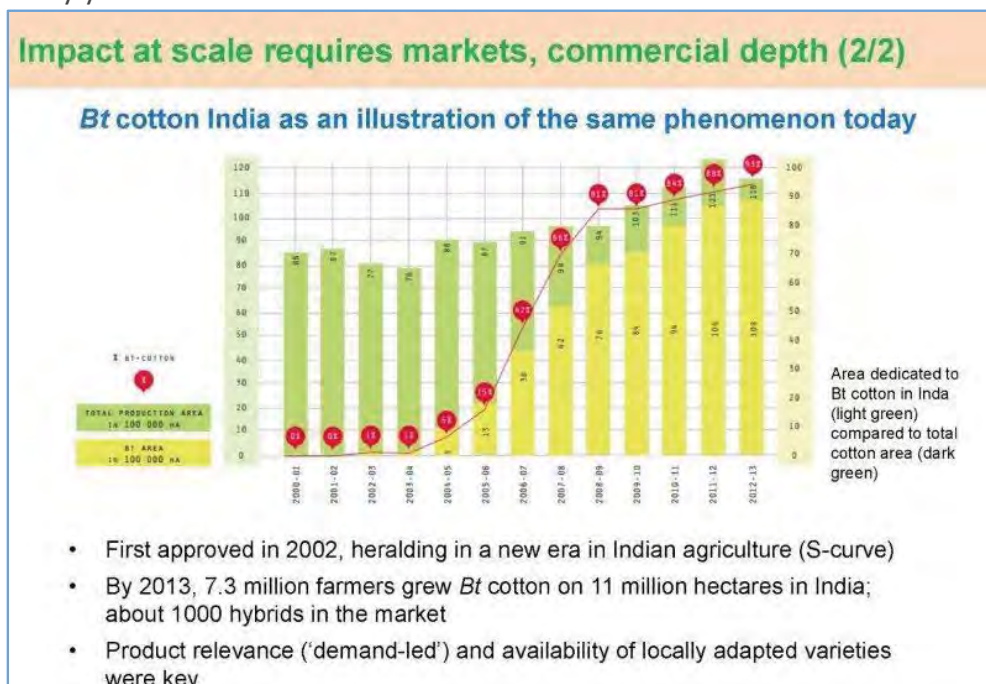


Figure 2. Adoption of Bt cotton in India – the same phenomenon as maize many years earlier.



Public/private task

Now what's the public/private task in this context? Historically the onset of sustained yield growth has been associated with the rise of the

private seed industry. In the U.S. the picture that I showed depicted subsequent different geographies later in life, later in the course of the 20th century. And in sub-Saharan Africa we have the last frontier in this respect, where it hasn't really happened yet, except in certain more advanced markets such as eastern southern Africa for maize; one of the drivers in more recent times behind that maize expansion is the demand for chickenfeed.

For a seed industry to emerge – and this is true for input industries, fertiliser, mechanisation tools and irrigation equipment, crop protection equipment and so on – a certain number of things are needed. Specifically in the first place public goods – I am not going to elaborate on this, I'm just going to highlight it as part of a caricature of the main issues. I will mention enablers of farm-level demand shortly.

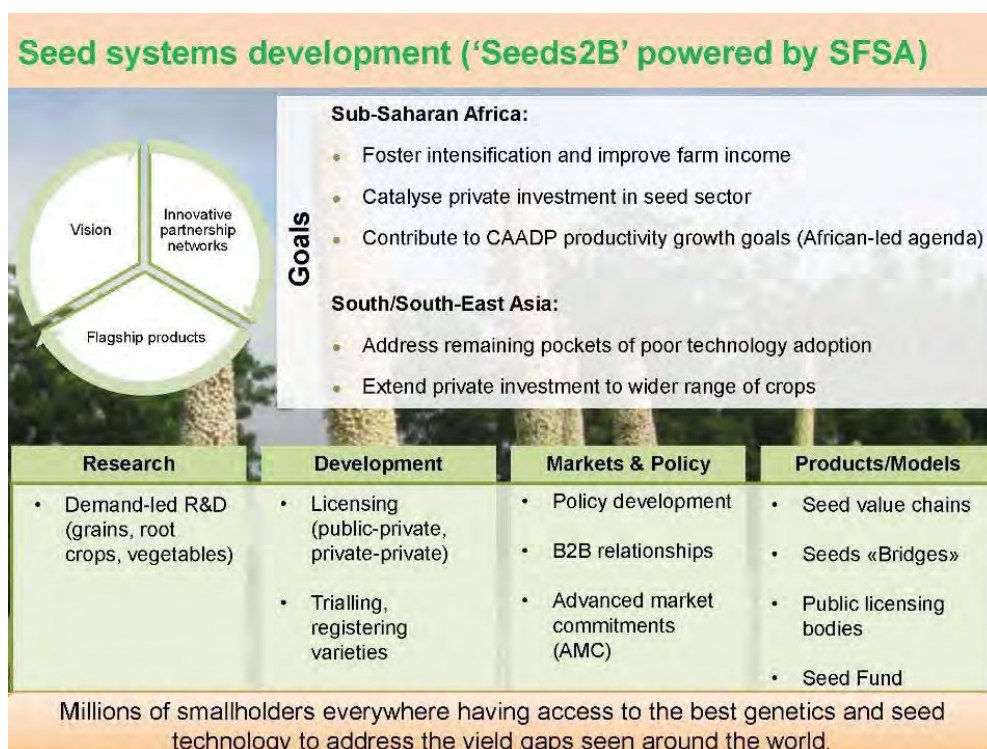
Public/private cooperation can kick-start markets, that's frequently what it's about, by addressing these institutional failures, the market failures that are typically present. Public/private cooperation also has a role in the functioning of value chains, in the creation of synergy in agricultural R&D. It also helps to shape social and environmental outcomes, because we know that markets left to their own devices do not necessarily deliver to society exactly the right outcomes. That's where governmental policy comes in, which is a form again of public/private cooperation, the right kind of regulatory system and so on.

Additionally, for seed markets specifically to develop (this actually applies to any input market), you need the right kinds of products. We need certain tricks or aspects of appropriability, otherwise the private sector cannot fulfil its goals of profitability which naturally go along with private sector activity (Fig. 3).

Enablers of farm-level demand

I now want to say something about the enablers of farm level demand. I was intrigued by the presentation about Sir John Crawford last night because, in preparation for this presentation, I also went a little bit into the annals of history and I learned more than I already knew about the World Bank mission to India in 1964/65 which Sir John of course took part in. You know he had the explicit major role of being the person in

Figure 3. Seed systems development – giving smallholders everywhere access to best genetics and seed technology.



charge of the agricultural dimension of that mission. And of course the agricultural dimension of that mission to India in the mid-1960s was probably 98 per cent of the mission, because agriculture was the economy of India. He says very clearly in the report that in addition to seed we need price support, public grain procurement, fertiliser imports and subsidies, agricultural credit, investment in irrigation and so on.

Those are the elements, the enablers that help create markets. Without those you will not have import markets. And of course I would add my own list to this list of enablers – property rights, land titles (very important), crop insurance was mentioned today already, information systems, digital decision tools and so on, agricultural extension, traceability, offtake arrangements and deals between buyers of products, offtakes and farmers, contract farming in that context. And of course the whole topic of farmer organisation is very important.

Crop insurance we have; our Foundation has developed a suite of new products in basically what we call index-based weather insurance, and

they're in the market now. In east Africa 250 farmers at least are going to be insured this year. And what we are learning is that crop insurance enables farmers to invest, actually we have had empirical survey data on that, we know that insured farmers invest. In the particular sample that I have in mind right now where we have the data, the differential is 20 per cent, that much more investment on the part of the insured relative to the uninsured control. What does that do in the context of my topic of input markets? It helps make input markets, because these farmers invest in fertiliser, seed and so on.

Role of the non-profits

Now what is the role of non-profits? In the world in which we operate it's about brokering public/private cooperation, and that has something to do with the fact that you need to understand certain things, you need to know the relevant actors, their skills, incentives, weaknesses, comparative advantages and then you need to be able to act, to invest, to listen, to convene and so on.

We have to consider the profit outlook, the sustainability and also the risk outlook, because in a world fraught with risk of agribusiness going forward implies the need for more brokering of corporate, for more cooperation and for more brokering of cooperation. The outlook is for continued incredible food demand growth. On the back of this we should be able to deliver rural development once and for all; and this is a new phenomenon – we have not had this before in the history of the planet. I'm old enough to know, when I started my career in agricultural economics the developing countries were all stagnant. The countries of Africa were stagnant for 30 years until they started to grow, we now have positive per capita growth since about the year 2000. India was stagnant until the mid-1990s. China became dynamic a little bit before that, and so on.

If you have a stagnating overall economy, forget rural development. The only answer for your rural population is subsistence farming and you know what subsistence farming is, a ticket into poverty, it is not a ticket for prosperity. And no farmer – small or large, male or female – has ever wanted to be a subsistence farmer. They have the same goals as you and I, they want to improve their situation. As farmers they know that

they're entrepreneurs, they have that in their blood and they want to sell and produce for the market while of course also producing for their own food needs.

Role of foundations

The role of foundations, in Syngenta Foundation we call it catalytic nudge. Here are three examples: seed systems, Triple M.A's demand-led plant variety design, these are examples of the many things that need to be done. Some of the things that we do have implications and generate dividends for the creation of functioning import markets, particularly with reference to Africa. Seed systems are the major market failure out there in Africa – in a sense that the interface between breeding which takes place in the public sector (such as it is) and seed production, bulking, treatment and salvage which is taking place (or should be taking place) in the private sector, that interface does not work.

So the Syngenta Foundation's program in seed sector development does actually six things. First, support breeding in the public/private space, in the public/private mode with an eye on the delivery of products to farmers. Second, offer licensing models to enable the progression of germplasm and products at various stages of completion from breeders to small-to-medium (SME) seed companies. Third, promote local seed production and value-chain development by intermediating and licensing technologies, aggregating farmer demand and providing basic business advice as well as intermediating finance for fledgling SME seed companies. Fourth, we operate a technology transfer platform which consists of, among other aspects of a trialling service, service agreements with IP owners and a variety of registration services. This year we'll be trialling 15 crops and 210 varieties in a number of settings in sub-Saharan Africa.

Point five, we work with public breeders and universities including five CGIAR centres to connect them to private sector delivery channels. Finally the sixth point, as part of this effort there is a policy analysis and advocacy component, because the seed regulatory systems are in need of some improvement – to say the least!

I will give you an example of one of those public/private partnerships – I’m sure Martin Kropff will be talking about this more. We have a collaboration that the Syngenta Foundation has brokered between CIMMYT and the maize R&D community in Syngenta to come up with a new generation of drought-tolerant maizes (Fig. 4). They’re affordable for the following reasons: they're not fancy single crosses, they’re triple crosses that are cheaper; they’re not the best top technology hybrids but they will still give you 80 or 90 per cent of the yield advantage of hybrids – and at a much lower price that makes them smallfarmer-affordable.

Figure 4. Partnership for breeding low-cost maize hybrids with improved dry-season yields.

Triple A maize
Accessible, Affordable, Asian


Partnership for breeding low-cost maize hybrids with improved dry-season yields



CIMMYT: Genetic diversity, field trialing network, experience in variety release

Syngenta: Molecular screening platforms, elite germplasm, performance assessment, product development

Syngenta Foundation: PPP models, royalty and IP ownership schemes; brokering function

→ *Distribution of new varieties through local seed companies*



So you can see what the various partners are contributing; from 2017 these hybrids will be going into 1.5 million hectares in south and Southeast Asia. We already have our eyes on eight to ten mid-tier seed companies that are beginning to voice interest in this particular product.

Market-responsive plant varieties

Lastly, I will touch on market responsive plant variety design. This is a program that we are doing together with the Crawford Fund and the

Food Security Centre of ACIAR). It's a partnership on what we call demand-led breeding. What we have postulated here is that one reason

why adoption in sub-Saharan Africa of improved varieties is so low is due to the lack of enablers for farmers, for example lack of access to credit and crop insurance.

Another dimension of the problem is that many of the available varieties, improved as they are, don't necessarily respond to exactly what the market needs and what the farmers need. They may have traits that perform well in terms of insect resistance or other biotic or abiotic stressors, but that may not be the real problem, and breeders in the public sector have not necessarily been trained to take advantage of or to heed the market signals and so on. So this program is about influencing ultimately the ecosystem of plant breeding in the public and the university sector in sub-Saharan Africa – to shift people's minds and allocate resources to actually work in the direction of more market-led market-responsive plant variety design.

I'll give you one example: tomatoes in Ghana (Fig. 5), where one of the problems is that even though it's the most important vegetable in Ghana (38 per cent of consumer spending on vegetables goes on tomatoes) there are three in-country processing plants that are currently not used. There is a lot of imported tomato paste from China and the EU, but there is a consumer demand for a differentiated fresh product, and then there is factory demand for processing to paste.

We do not have the right kinds of varieties to respond to these market opportunities. So we currently have a partnership between the three organisation that I have mentioned to develop the right kinds of market-based or responsive products that will at the same time have the traits that maybe needed – such as nematode resistance, yellow leaf virus tolerance and heat tolerance.

In conclusion

What's the conclusion to everything that I have been running through perhaps a little bit too fast? Markets are the vehicle for scaling up (Fig.

6). I got myself into deep trouble not long ago in Zurich at a meeting with a lot of NGOs where I stated: ‘NGOs don’t scale.’ Now of course I’m

Figure 5. Lifting tomato production, processing and marketing in Ghana.

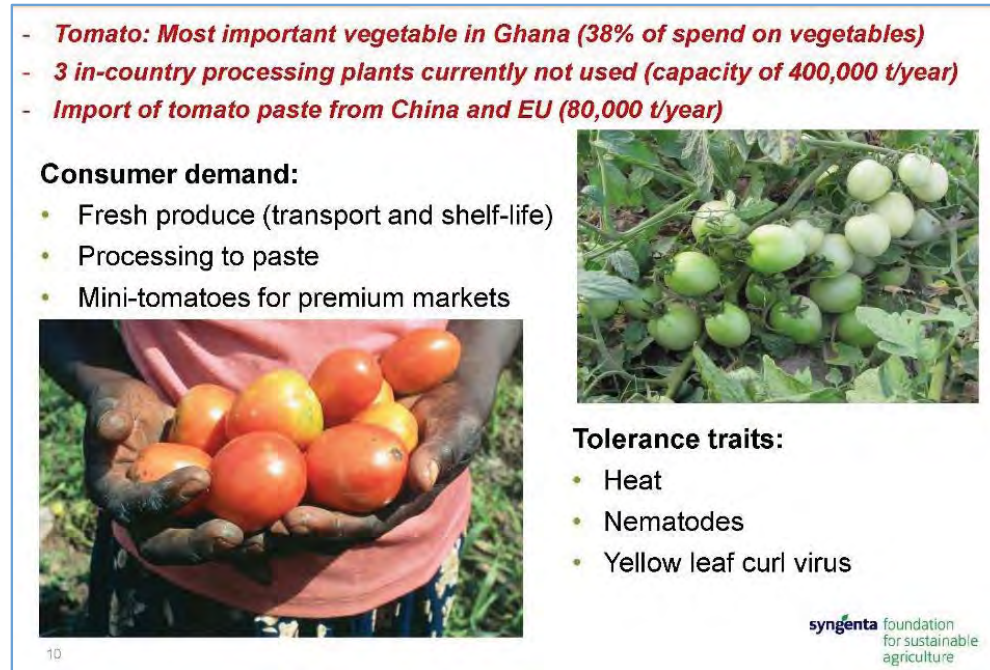
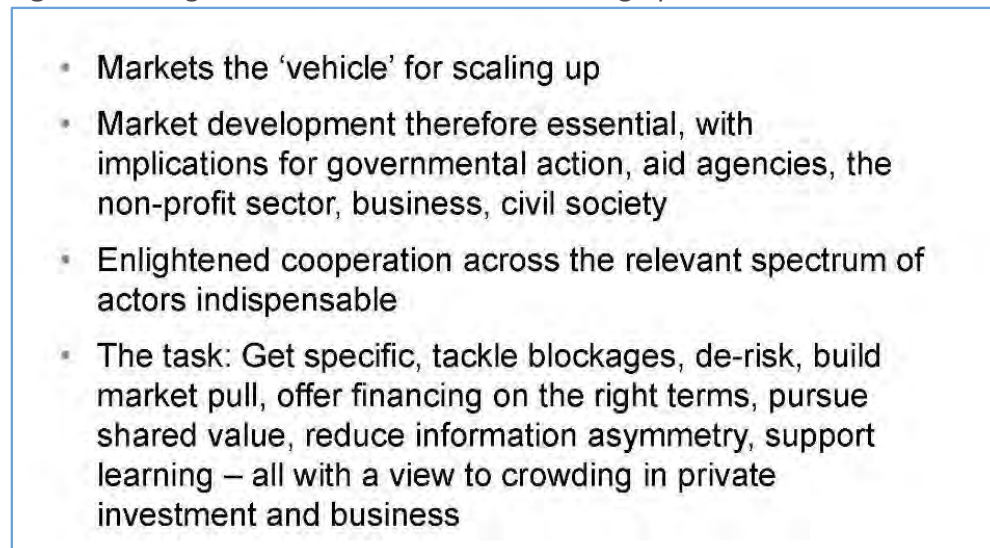


Figure 6. Using markets as the vehicle for scaling up.



sure this is also controversial here and I’m not saying that no NGOs scale! But really, scaling as per my first two slides – Bt cotton India, hybrid corn the U.S. – and a lot of other evidence that I could have also presented to you – happens through markets. And small-scale farms are not necessarily an obstacle to scaling to markets, if you supply them

with the technology, the services, and access to markets on the output side. That's our task.

If markets are the vehicle for scaling up, then market development is therefore essential and that again requires certain actions, and these have implications. But in the end it is really about getting specific, about tackling blockages, about de-risking the entry of, for example, seed companies or fertiliser companies into the market; it's about creating market pull, offering finance on the right terms. I have not discussed this in my presentation, but the notion of shared value is very important. Reducing information asymmetry is of critical importance because market participants cannot interact on an equitable basis if one party has a lot more information than the other.

Support data collection, research, learning, all of it with a view to crowding in private investment and private business. Because private investment and private business offer the way to scale up and to deliver the services to the farmers that they're expecting from their society, from their economy, from their governments, from their private sector.

Reference

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Dr Marco Ferroni is an expert in international agriculture and sustainability issues. He joined the Syngenta Foundation for Sustainable Agriculture as its Executive Director in 2008 after a career in multilateral institutions and government. Before joining the Foundation, Dr Ferroni worked at the Inter-American Development Bank and the World Bank in Washington DC. As Deputy Manager of the Sustainable Development Department of the IDB, he had responsibility for regional sector policy and technical support to the Bank's country departments. As the IDB's Principal Evaluation Officer he assessed the relevance, performance and results of Bank strategies and investments. As a senior advisor at the World Bank he advised on donor relations and directed work on international public goods and their role in development, foreign aid and international affairs.

Earlier in his career, he was an economist and division chief for economic affairs and international trade in the government of Switzerland. He holds a doctoral degree in agricultural economics from Cornell University.

How can business reduce impacts on the world's biodiversity?

Matt Willson

National Manager, Corporate Partnerships, World Wildlife Fund: issues for the non-government sector

Abstract



The majority of a company's environmental impacts exist outside its operational footprint—in its supply chain and typically in the production and harvesting of raw materials for food for human and animal consumption, fuel and materials. The impacts of commodities like palm oil, soy, timber, and pulp and paper on iconic places like the forests of the Amazon and Borneo are well known; a similar magnitude of impact is being felt globally with approximately 50% of the loss of biodiversity being due to primary production.

These impacts also pose some of the most significant threats to a company's security of supply of key inputs, brand reputation and bottom line. These risks are increasingly leading some companies, particularly multinational food, beverage and grocery companies and brands, to implement wide-ranging strategies for sourcing raw materials more sustainably. WWF's analysis shows that around 500 companies control or influence roughly 70 per cent of global markets for commodities.

Initial steps toward improved sourcing include using tools to better understand environmental and social risks in their supply chains and prioritising focus areas for risk mitigation. With this information companies are developing transition programs for key commodities, including publishing time-bound targets for the purchase of credibly certified commodities, engaging primary producers, and partnering with NGOs to improve their understanding of social and environmental issues. Others are going further by supporting collaborative action to shift their sectors and influence government, for example, through multi-stakeholder initiatives and roundtables or joint advocacy with NGOs and other private sector actors.

Thank you for inviting me here today. Being from WWF I will be presenting the non-government sector perspective and since we're an environmental NGO there will of course be an environmental focus in this presentation.

I'm pleased first of all that there seems to be a running theme of partnership and collaboration in the discussions that we've been having so far - it's my firm belief that that's where value can be generated, particularly where partnerships are created between unlike entities.

Partnerships between unlike entities can make engagement more challenging but ultimately I think we can magnify outcomes.

My presentation is designed to give you an insight into who WWF are, our general approach, what we do specifically in relation to agriculture and agribusiness, and why we're interested in supply chains. This presentation primarily focuses on the downstream supply chain aspects, not at the production level.

First of all, a real snapshot of what WWF are doing with business, what business is doing by itself and some of the trends we're starting to see – very much at a global level but also now starting to be seen here in Australia. First of all, some background.

This chart (Fig. 1) is a useful summary of why WWF is interested in primary production. This is a graph on loss of biodiversity – or more specifically mean species abundance. The first tab is looking back to the year 2000 and the following ones are projecting forward to 2030. I'm not going into too much detail here, but the interesting observation is that approximately 50 per cent of the impacts on biodiversity are due to primary production – specifically food crops, energy crops, pasture and forestry.

So narrowing down WWF has identified 15 commodities that are disproportionately responsible for that 50 per cent loss of biodiversity and the projected loss (Fig. 2). And they sit across three categories – food, fibre and biomaterials. In food it's predominately palm oil, beef, dairy, soy and sugarcane; fibre covers timber pulp, paper and cotton; biomaterials incorporate biofuels and bioplastics.

This diagram (Fig. 3) shows the interactions between what WWF calls priority places – like the Amazon, Great Barrier Reef, places that are really important from a biodiversity perspective – and the commodities which are primarily impacting those priority places. Then we add in the companies and brands that are responsible for the utilisation of those commodities, noting these are indicative. This is a snapshot of how WWF looks at the world in terms of supply chains.

Figure 1. Major drivers of biodiversity loss globally.

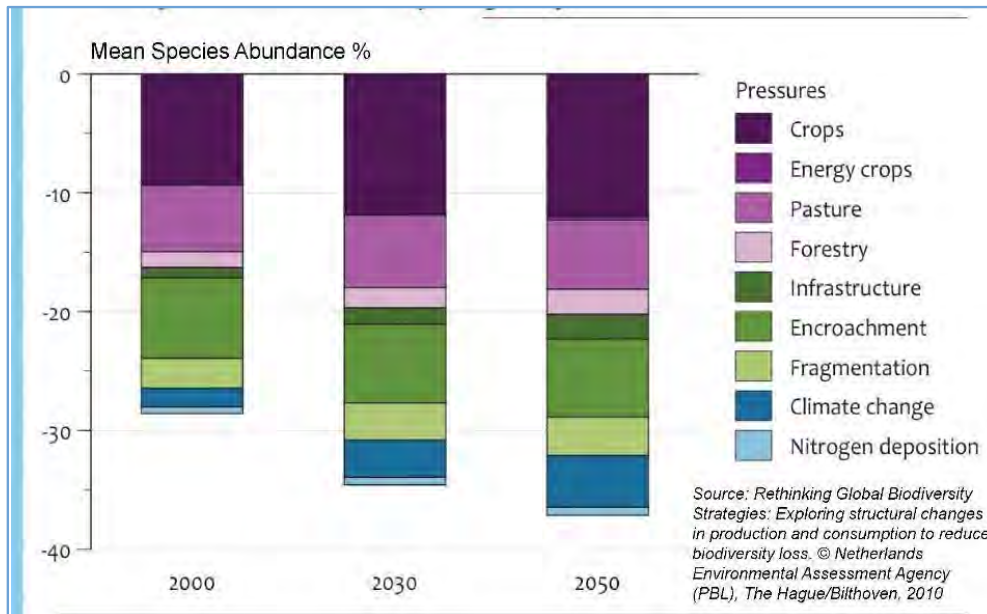
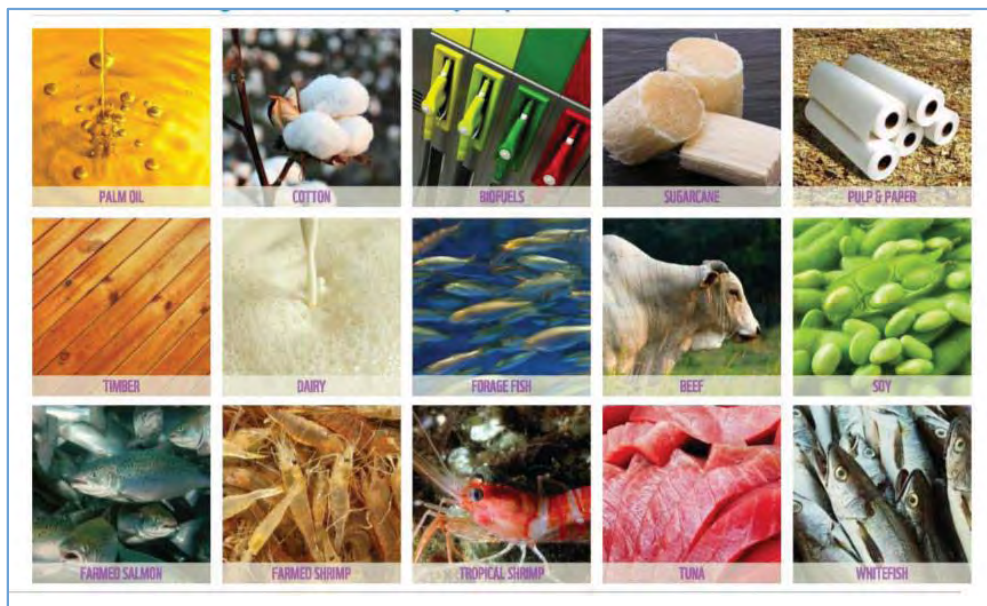


Figure 2. Commodities with a high environmental impact/risk.

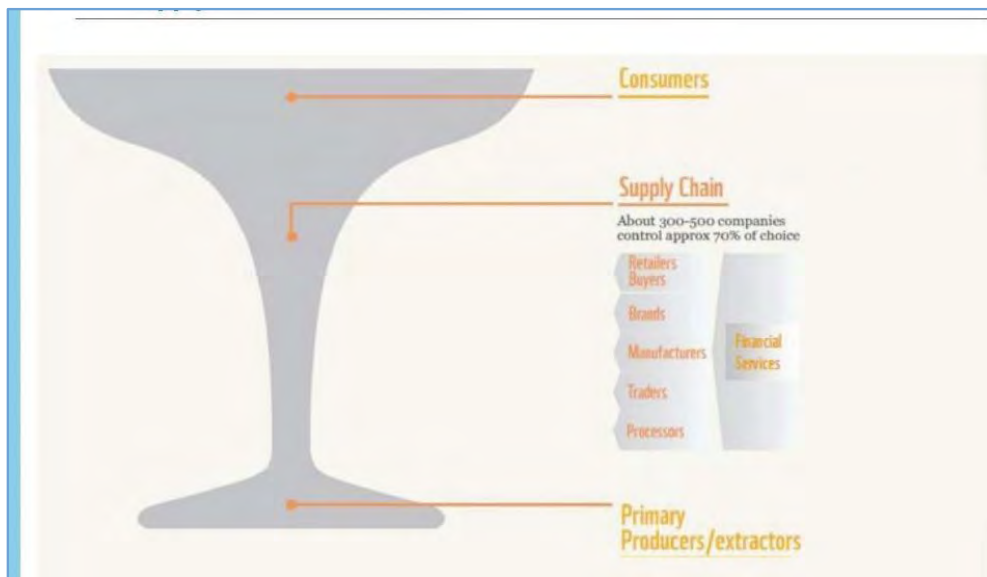


The rather simplified diagram of a supply chain in Fig. 4 shows consumers at one end and primary producers at the opposite end. The

Figure 3. Linking biodiversity with supply chains.



Figure 4. Supply chain concentration.



interesting point to note is that there are between 300 and 500 companies that control or heavily influence 50–70 per cent of the choice of those 15 commodities I mentioned. From that you can infer that these 300–500 companies are having a material impact on priority places and biodiversity.

Market transformation approach

At WWF this is known as the market transformation approach: focus on the major companies, primarily retailers, brands, commodity traders, processors and manufacturers, who have disproportionate impact on the environment through their raw material sourcing, but also the finance industry comprising the lenders and financiers who provide capital to primary production projects.

We're starting to see a progression towards what we call responsible sourcing. The initial focus is on internal aspects, understanding where the risks are in a company supply chain, moving towards some internal action and then shifting towards external action and projects, and engaging key stakeholders. I'll now take you through what we're starting to see in the market and also what WWF is doing with the key actors in market.

We've observed particularly here in Australia over the last five or six years a shift in focus on responsible sourcing issues and on companies responding to those issues. This has been significantly driven by NGO pressure through campaigning but also negative media together which have driven the focus areas for action from companies. But now we're starting to see a bit more of a holistic broadened approach to understanding supply risk and eventually mitigating and managing those risks (Fig. 5).

WWF clearly has a strong interest in environmental risks, but we're well aware of the social impacts and risks in the supply chain and we're also conscious of other commercial risks such as security of supply issues and economic and financial risks such as price volatility and supplier concentration. WWF's been working with the likes of McDonald's, Johnson & Johnson and Edeka (a major German supermarket retailer) to identify where the risks lie in each company's supply chain.

We're also starting to see interest, largely at a global level but gradually here in Australia also, around water risk in supply chains. This is a water risk heat map (Fig. 6). This map incorporates not only water scarcity and water quality, but also regulatory regimes and their ability to resolve

Figure 5. Supply risk analysis.

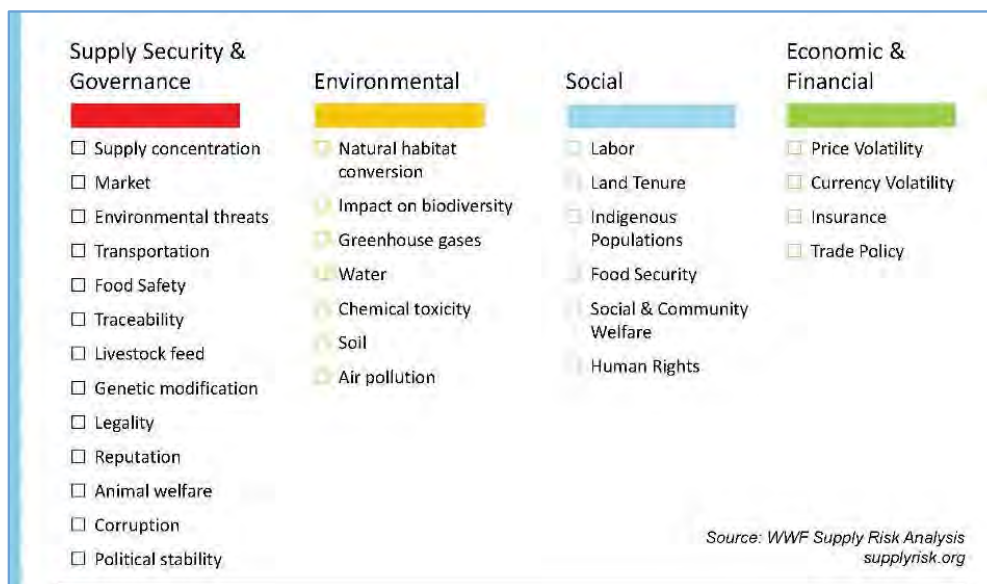
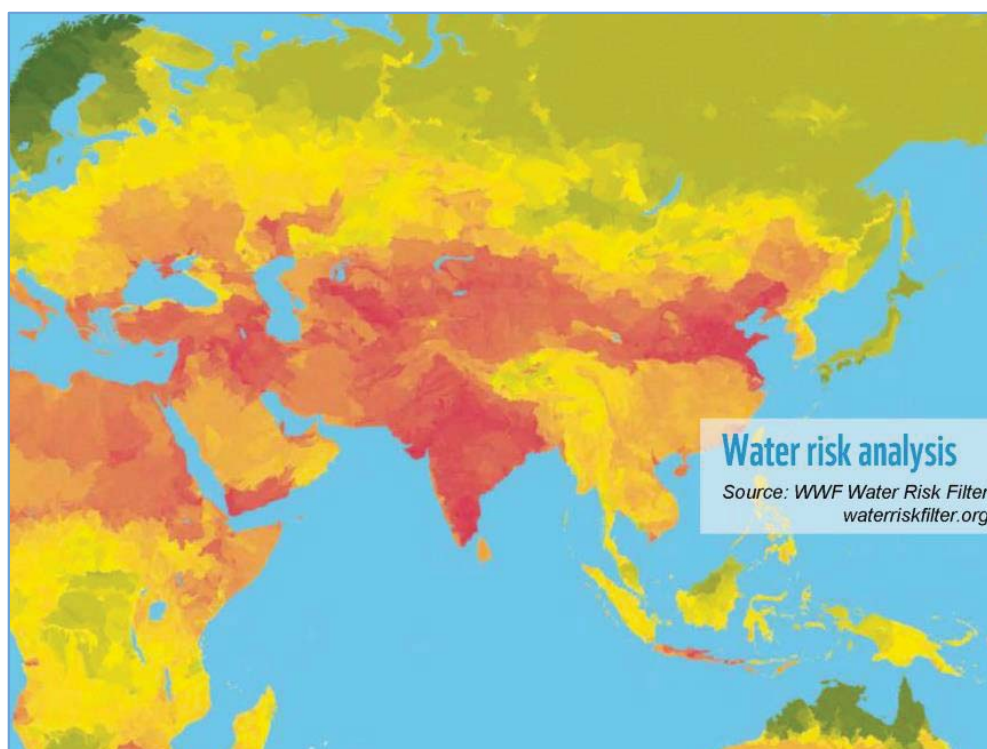


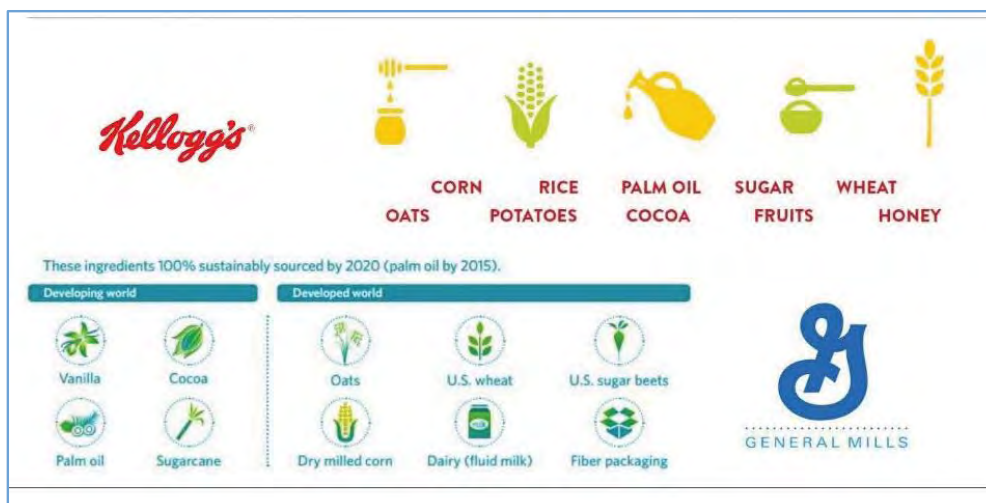
Figure 6. Water risk analysis.



water-related issues and to deal with impacts on ecosystems. We now have 13,000 organisations and companies starting to use this tool to understand their exposure to water risk.

Another approach we've promoted is prioritisation of risks by companies. It's about accepting the fact that the major food buyers and brands, have huge scale and diversity of risk across their supply chains. So we've encouraged a process of prioritising commodities which are strategically important but also have a disproportionate impact due to their effects on the environment and in a social context. From this diagram (Fig. 7) you will see the commodities Kellogg's and General Mills have prioritised for action. You will see some common ground there with WWF's 15 commodities; sugar and palm oil are incorporated in both priority lists; but they've also prioritised other commodities which are strategically important to them.

Figure 7. Companies use commodity prioritisation.



Standards and certifications

We're also seeing companies we work with and others we engage with utilising standards and certification systems. From a consumer perspective we typically see these as eco labels, however this isn't necessarily about eco labels, it's about having standards that can verify the chain of custody of a product or raw material from production through to manufacture or retail. Although there's a proliferation of certification systems in the marketplace, and this is often held up as a criticism due to consumer confusion, we're seeing a concentration of activities around a small number of certification schemes and standards that meet certain criteria.

One of those criteria is that the certification system or standard has to be available on a global basis, so it has to mean something in multiple markets. From a corporate perspective sourcing different standards in different geographies adds complexity, so ultimately certification systems and standards fulfil that function. But also the certification system and standards have specific criteria, including strong governance and dispute mechanisms, and are often developed through a multi-stakeholder process – some of the features that you don't often see with other competing standards and certification schemes. They also generally incorporate considerations of both social and environmental impacts.

I will give you an example, I'm not sure how many in the audience have heard of Bonsucro. Bonsucro is a certification standard that has been operating since 2008 (Fig. 8). The brands on the right are the ones that have made commitments to Bonsucro and you see some of the major sugar users including Coca-Cola, the world's biggest buyer of sugar. Four per cent of the world's sugarcane is now grown to the Bonsucro standard, primarily in Brazil but also some now coming out of Australia, and that's significant growth over a seven-year period.

Figure 8. Many significant companies (listed at right) have made the commitment to the Bonsucro standard for sugar production.



Setting targets

Moving on from prioritisation we're now seeing major corporations setting targets and public targets. The examples here are McDonald's and Unilever. This is important as it sends a message to suppliers, customers and other stakeholders about their company's intentions on future sourcing. Unilever is stating its intention to source 100 per cent of their agriculture commodities sustainably by 2020.

Associated with targets are transition programs (Fig. 9). This diagram shows the transition program relating to a major company's sourcing of pulp and paper. The graphic shows a decrease in the volume and proportion of unwanted materials in supply chains – such as those that are illegal or unsustainable – and increasing the amount of credibly certified material such as that certified by the FSC, Forest Stewardship Council.

In the last four years in Australia we've had partnerships with Coles, Simplot (owner of the John West, Birds Eye and I&J brands) and Blackmores. As part of their commitment to shift towards sustainable supply chains they're required to invest into their supply chains. The example here (Fig. 10) is of Simplot and John West investing in maintaining the MSC (Marine Stewardship Council) certification for a skipjack tuna fishery in the Maldives. In our view it is important that companies invest at the production level to improve environmental and social outcomes particularly where those commodities are strategically important to them.

My next topic is about shaping new standards. I don't know if anyone's heard of the Global Roundtable for Sustainable Beef, it's a multi-stakeholder initiative that started three years ago and has focused on developing a verifiable standard for sustainable beef – clearly a challenge. WWF is involved, and so is McDonald's, which is significant as the world's biggest buyer of beef and a major consumer-facing brand.

Again it's really important that companies we are working with are also not just buying commodities which are verified or certified by third parties as being sustainable but also helping shape new standards where there are gaps.

Figure 9. Transitioning to more responsible sourcing of supply for pulp and paper.

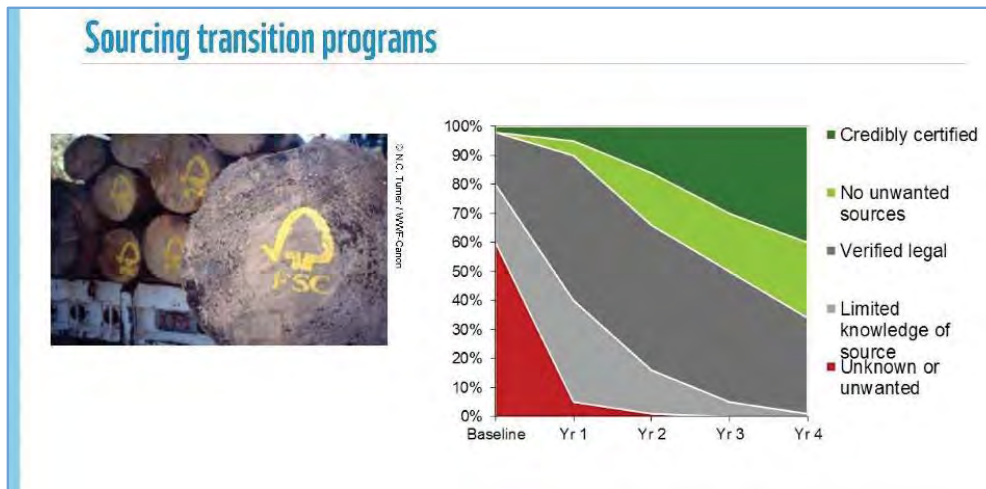


Figure 10. John West and its parent company Simplot have invested in maintaining the MSC (Marine Stewardship Council) certification for a skipjack tuna fishery in the Maldives.



In conclusion I will just mention industry-driven commitments. It is encouraging that 18 aquaculture salmon producers, essentially all competitors, have got together and agreed that as an industry they will work towards having 100% of their operations certified by the ASC (Aquaculture Stewardship Council) standard by 2020. This group of 18 companies represents 70 per cent of volume of farmed salmon, so that's quite a significant commitment. From our perspective it's great to see that level of collaboration by competitors – perhaps unprecedented on a global basis – and something WWF strongly encourages.

Matt Willson leads on private sector partnerships, business engagement, and corporate philanthropy for WWF (the World Wildlife Fund) in Australia. Matt's role is to engage and broker partnerships with major retailers, manufacturers and brands, traders and investors focused on reducing biodiversity, water and climate impacts from agriculture, forestry, fisheries, and aquaculture. This has included responsible sourcing partnerships with the likes of Blackmores, Bunnings, Coles, Kimberly-Clark, Officeworks, Simplot, Tassal and Unilever. This work forms part of WWF's global market transformation initiative which seeks to change the way key commodities are sourced, produced, processed, consumed and financed. Matt also provides an advisory and capacity-building role to WWF business & industry teams across Asia-Pacific. Matt joined WWF in the UK in 2007 and moved to the Australia office in 2008.

Matt previously worked at the Zoological Society of London, UK in business development and project management roles. He has also co-led sourcing of bilateral and multilateral government funding for a humanitarian landmine clearance organisation, and developed and provided operational oversight for environmental conservation and biodiversity research projects across East Africa, Central America and South-East Asia. He holds an MBA from Imperial College Business School, UK and BA Economics & International Studies from the University of Warwick, UK.

Grow Asia: a multi-stakeholder approach to food security

Alison Eskesen

Director of Knowledge and Accountability, *Grow Asia*

Abstract



By 2050, a global population of 9 billion will demand 70% more food than is consumed today. Feeding this expanded population nutritiously and sustainably will require substantial improvements to the global food system—one that provides livelihoods for farmers as well as nutritious products for consumers. To achieve on-the-ground improvements, the World Economic Forum launched the Grow Africa and the Grow Asia partnerships.

Grow Asia, launched in April 2015, is a partnership among leading companies, national governments and civil society to enable sustainable and inclusive agricultural development in South East Asia. The partnership facilitates multi-stakeholder collaboration to develop the productivity and profitability of smallholder farmers and to improve the environmental sustainability of agriculture.

Thank you to the Crawford Fund for having me here. You already have heard quite a bit about the population growth in the world, having to feed an additional three billion more people. You've heard about the pressures that changing appetites and food preferences put on increasing the amount of feed that's produced.

What you may or may not have heard, but I'll repeat it now just because I'll refer to it later, is that 2.2 billion people in Asia secure their livelihoods or secure incomes from agriculture. You've already heard quite a bit about biofuels and the pressure that biofuels or the increasing use of alternative energy can create in terms of shifting agricultural land from food to produce biofuels. And we've talked a lot about water scarcity and obviously climate change, and what climate change will do both in terms of pests and the ability to be productive.

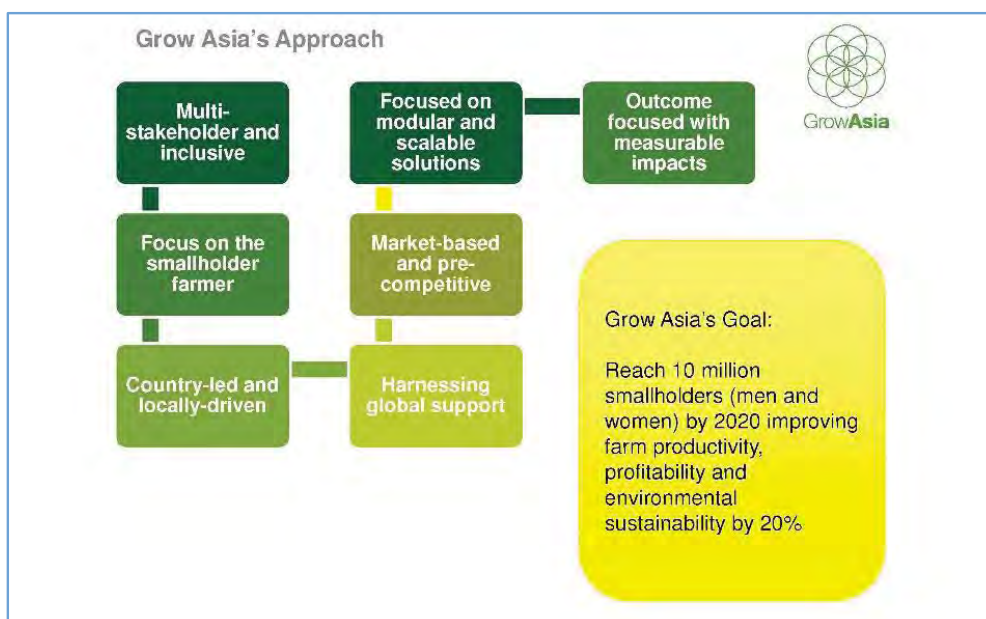
So what does this confluence of different challenges mean? Well we believe at *Grow Asia* that it means we need to change the way we're doing business; we need to change the way that we look at food security, and in order to do that we believe in a multi-stakeholder approach (Fig. 1). *Grow Asia* was catalysed by the World Economic Forum as well as the ASEAN Secretariat with incredible leadership and funding from DFAT as well as the government of Canada.

Figure 1. A confluence of challenges demands a confluence of stakeholders.



You've actually seen this slide from a variety of different presenters today, which is really interesting (Fig. 2). It's the idea that in order to have a multi-stakeholder partnership be successful, to achieve scale, you need to have these different stakeholders. You need the private sector,

Figure 2. *Grow Asia's* approach to meeting the needs of smallholders.

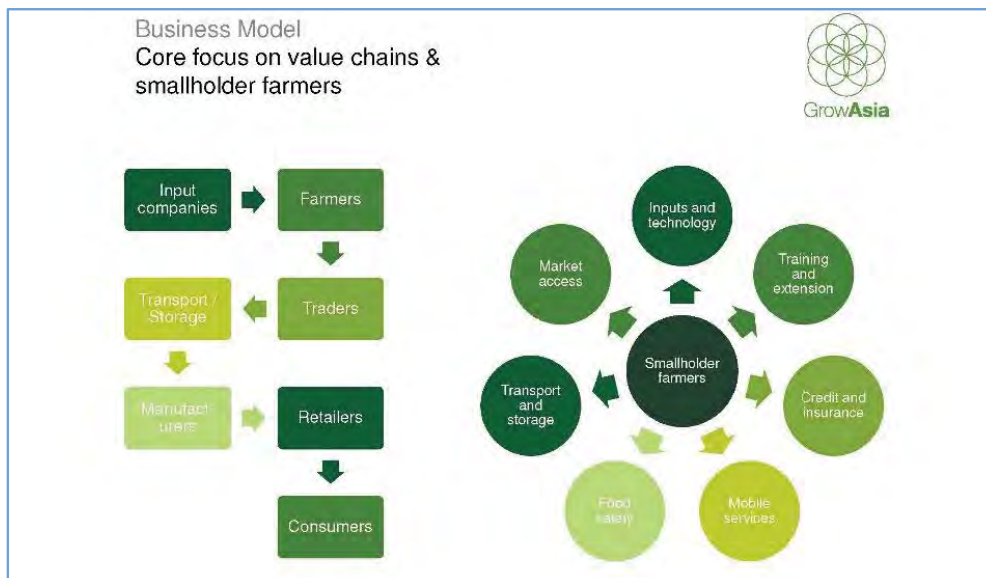


you need the government, you need civil society. You also need farmers. One of the things we talk about at *Grow Asia* is that in order to truly engage farmers in the process and to have smallholder farmers as active participants in solutions that are sustainable and scalable, you actually need to engage them in that conversation as well. We have also talked about donors as well as researchers and academia. So the focus of my time will be: What is Grow Asia's approach and why is this something that we think is particularly valuable at this point in time?

Engaging smallholder farmers

As I mentioned we're a multi-stakeholder initiative. We are inclusive, we currently have over 100 companies that are participating in Grow Asia as well as a variety of civil society leaders and ASEAN governments. What really glues all of these stakeholders together is their focus and commitment to improving the lot of smallholder farmers (Fig. 3). It is an unusual initiative in that Grow Asia as a secretariat is not controlling and pushing down the agenda, but rather the agenda is being driven at the country level.

Figure 3. The business model has a core focus on value chains and smallholder farmers.



You heard from Dr Lee earlier about PISAgro, which is one of the country partnerships within Grow Asia – the Indonesia country partnership. And it's amazing that you have local companies as well as multinational companies coming together at the country level, looking at value chains, saying 'here's our priorities, here's where our priorities overlay with the government of Indonesia's priorities and here's what we're willing to fund to try out new approaches to make change'.

And what's interesting is that because of our connection to the World Economic Forum we use their platform, with global CEOs coming together and committing publicly that they will achieve changes in the way that their businesses are conducted. And what this allows is that at the country level country CEOs, country directors, country managers have both the mandate as well as the bandwidth to say: 'OK let's go and test new approaches; how can we commit, how can we find the resources internally to fund new activities that focus on smallholder farmers'.

New ideas and approaches

In talking with the four country partnerships that we have, and I'll get into them in more detail, it is an interesting mix of testing new ideas and new approaches combined with rolling out proven technologies and proven approaches that have already been tried and tested in developed countries. What's interesting about Grow Asia and all of our country partnerships is a focus on outcome and a focus on measurable impacts. And Grow Asia's commitment, as I think you've heard Dr Lee already say, is really around helping 10 million smallholder farmers by 2020 improve farm productivity and profitability by 20 per cent while improving environmental sustainability by 20 per cent (that's really looking at reductions in water use as well as greenhouse gas emissions).

So our approach and how it differs is that we focus on a value chain. As I mentioned it's a multi-stakeholder approach and so we bring together different partners and different pieces of the value chain, enabling discussion about what kinds of activities they are willing to fund at the country level. Some of the needs that smallholder farmers have are represented either by civil society or by the farmers themselves. For example, some issues could be around technology. We heard quite a bit

about disruptive technology, but it could be as simple as training and extension services, having the right knowledge at the right time to make the right types of decisions. Clearly financing becomes a huge issue when you start to think at the smallholder farmer level, how do you upgrade in terms of the resources and inputs that you put into your farm, what do you think about transport and storage to reduce wastage.

Hallmarks of *Grow Asia*

So what distinguishes Grow Asia? First of all there is political will and engagement. At the Grow Asia Forum where we were launched in April 2015 we had the unanimous approval from ministers of agriculture from every ASEAN country. We had the most senior political leadership coming and supporting us, saying: ‘We are inviting the private sector to come and collaborate with the government, for us to identify ways in which we can work together to enhance food security, ways in which we can work together to help strengthen smallholder farmers’.

And we have incredible corporate leadership. Our Grow Asia Business Council includes many of the top multi-national corporations working in food. While we firmly believe multinationals have a leadership role to play in the quest for food security quite frankly you can’t do it alone – you shouldn’t have to do it alone – to do so puts you at a disadvantage. And so we at the country level as well as at the Grow Asia level really look to ask how we can engage local companies to be part of the solution, to try and test new ideas.

We also think it’s incredibly important and invaluable to have civil society participating with us. One of the interesting things about Grow Asia and multi-stakeholder initiatives is the different perspectives that you bring. Where the private sector has incredible channels of distribution and incredible R&D knowledge they don’t necessarily have the same experience working with civil society, taking into consideration environmental effects, or engaging community participation so that you have community buy in. So bringing together the different stakeholders that represent those diverse interests adds up to a sum that is greater than the value of the individual parts.

Farmer Advisory Council

One of the things that Grow Asia will be doing in the next couple of months is formalising the Farmer Advisory Council. We think this is incredibly important, it is a process that is owned at the local level, and if you don't have farmers' voices as part of the conversation you're doing it on behalf of them rather than in coordination with them. The other thing that Grow Asia is working on concerns creating stronger linkages to researchers. We realise that an incredible amount of information and technology already exists, but it's not being commercialised and it's not being brought either at the corporate level or necessarily at the smallholder farmer level. So we need to define how we can create those linkages so that we get more information out at the right times.

The value of partnerships

One of the really interesting things that I've heard today is that there are so many different companies engaging in a variety of different partnership models; we think this is incredibly important and incredibly valuable. One of the things that we're hoping to do at Grow Asia is to take some of those lessons learned and best practices and help to disseminate them. But we are also having a greater conversation at the ASEAN level, at the regional level, about what does food security mean and how to engage in partnership to achieve it.

In one of the earlier slides I talked about the engagement of the private sector. I also overheard earlier today somebody talking about the role of philanthropy and how this is an interesting approach. But really, this is philanthropy and one of the things that we think is important – I'll get to it at the very last slide. If you want to achieve food security you must talk about it at scale. Project by project is a start, but it's certainly not the end game.

One of the reasons we have such significant participation by the private sector is that they already see that there's a business case to be had for trying new approaches and for engaging smallholder farmers (Fig. 4). That applies whether that's new market development, gaining market insights, securing your supply chain, or simply establishing a dialogue that was difficult to have with a government in ASEAN before.

Figure 4. The business case for engagement.



From the government side one of the things that we hear is it's incredibly important to have partnerships because governments are already worried about corruption – or in some cases should be more worried about corruption – and if you have a partnership approach then it's easier for them to talk about catalytic changes in policy that the private sector needs in a way that is more transparent. That explains why they're talking to certain partners and not to other partners, it's about guarding reputation.

The important thing is that we have four partnerships already started, two of which are quite senior (Fig. 5. We have both Vietnam and Indonesia, and PISAgro's Dr Lee already described working across a variety of different commodities. The commodities are selected by establishing an overlay between what the ASEAN governments (or a particular host government) priorities are, as well as what the corporate interest is. So it's really driven by the private sector.

In terms of a partnership, one interesting activity took place in Vietnam with 75 demo plots of coffee in four provinces (Fig. 6). It resulted in farmers' yields increasing by 21 per cent with their net income increasing by 14 per cent. It reduced water usage by 30 per cent and

Figure 5. Supporting partnerships in four countries.

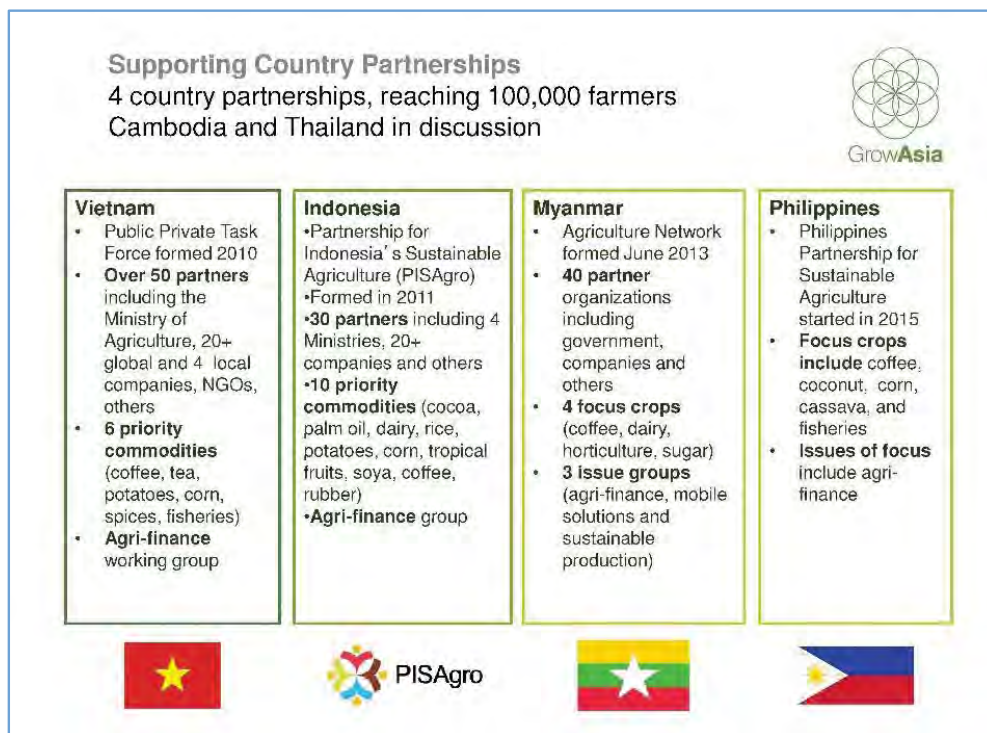


Figure 6. The partnership for coffee in Vietnam.



fertiliser by between 18 and 23 per cent (depending on where you were). And interestingly it decreased carbon emissions, which really

speaks to a variety of the different challenges that I laid out at the outset and that others have already very articulately described.

In the interest of time I won't talk about Indonesia, there is a summary on the slide (Fig. 7). Also Dr Lee has already mentioned a variety of different activities of that country partnership PISAgro which are incredible.

Figure 7. The partnership for corn in Indonesia.

Country Partnership Projects in Detail
Corn in Indonesia



Target: By 2020, train 5 million corn farmers on 1.25 million hectare land with productivity target of 8 tons/hectare

Results:

- Trained 34,100 farmers at 15 field schools covering 24,000 ha.
- One demo plot of GAP
- Increased
 - Productivity by 33%
 - Incomes by 44%
- Generated US\$83,000 private investment.
- Channeling US\$25,000 working capital credit to farmers

The group is also testing a new model on coconut-corn intercropping to enable income diversification.

Partners:

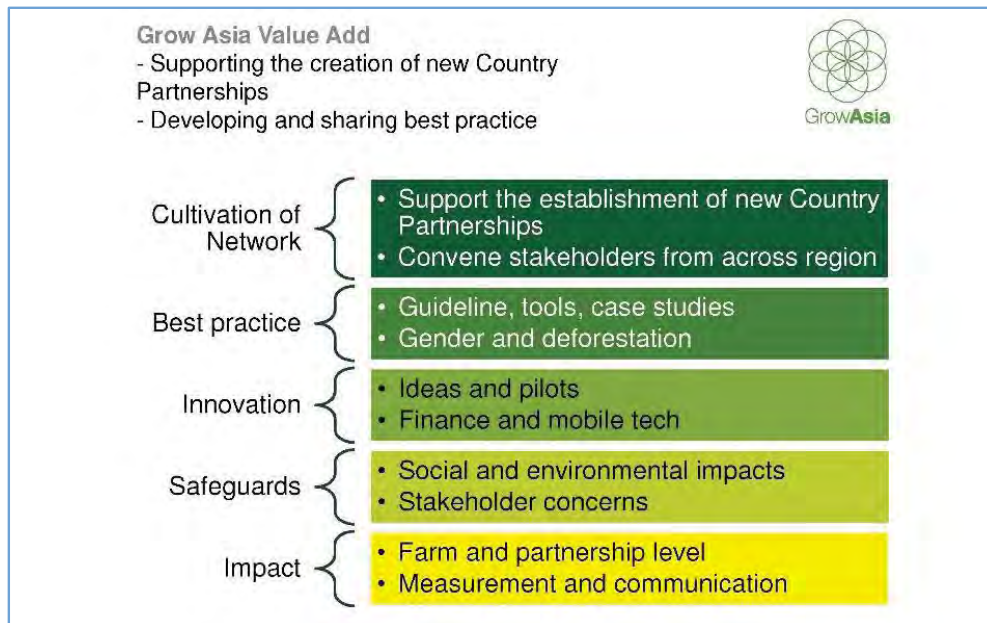
- BRI, Cargill, Syngenta, Monsanto
- Indonesia Ministry of Agriculture, Directorate General of Food Crops
- Mercy Corps



Rationale for *Grow Asia*

As you start to think about Grow Asia's value-add, why I'm here and why the Government of Australia and the Government of Canada have given their support, you can see that the rationale in terms of creating Grow Asia is about creating new country partnerships (Fig. 8). So outside those four countries, how do we engage more countries in looking at food security through a multi-stakeholder partnership and thus cultivate that network? It's also about sharing best practices and providing the tools and resources so that each of the stakeholders can understand what their partners are doing – and again the sum is greater than the individual parts. It's built around innovation and helping to cultivate that innovation.

Figure 8. Value adding through creation of new country partnerships



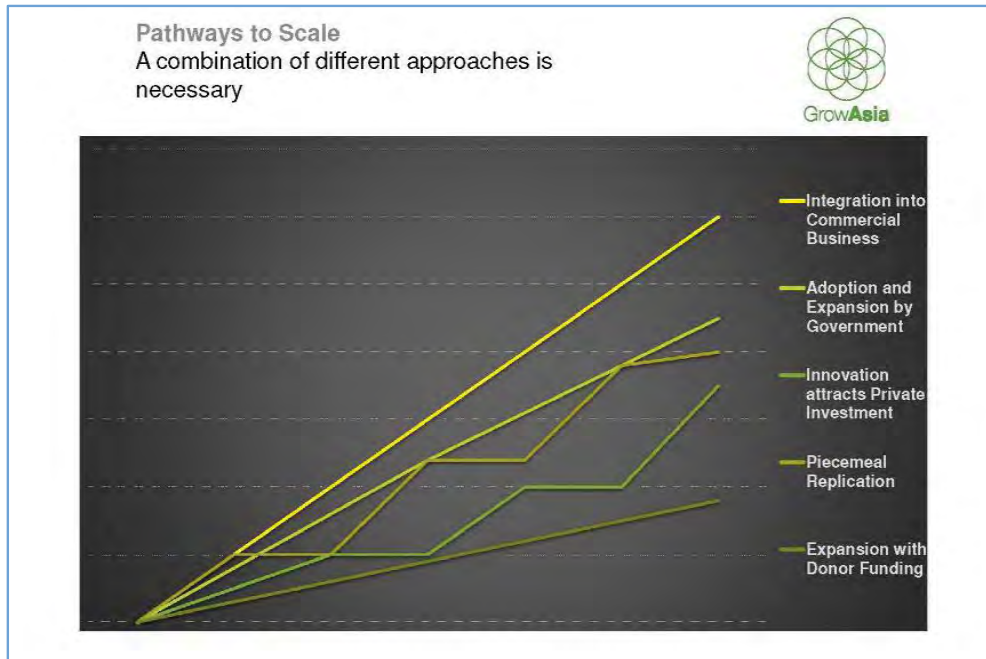
Equally it's about ensuring that there's environmental and social safeguards. This talks a little bit to the idea of securing reputation; those private sector partners participating in Grow Asia are obviously concerned about their reputations and hope that by participating in Grow Asia they receive a positive benefit to shore up those reputations. But most importantly it's about impact, and we need to measure that impact to gain an understanding of how there can be change. And this is really important because it gets to the question of how best to scale.

This slide depicts the five different pathways to scale (Fig. 9) – none of them alone will suffice. It's the collection of all five pathways that we're looking at because without those five pathways we simply aren't going to get there. And so the first, which perhaps is the steepest, is the idea that you're integrating different activities that are done at the country-partnership level into the commercial business, so that the business can say: 'I ran this activity, it was a pilot and from it I realised that there's a commercial reason for me to change the way I'm currently doing business – it's more profitable for me, I have more reliable supply chains, it is in my corporate best interests'.

Second is the idea of government adopting the partnership's activities, and considering how you start to think about the government owning

different pieces of it and participating: whether it's a facilitating enabling environment, whether it's passing different policies, whether it's investing in infrastructure in the right places.

Figure 9. Five different pathways to scale.



A less steep approach but still an interesting one is around thinking about innovation. How do you take that innovation and attract greater investment into it, how do you see more funding from either venture capital, private equity, lenders, impact investors, come in to grow the resources that are available around agriculture? There's also the piecemeal approach, replicating successful pilots. The smallholder farmers who are working there now have more assets, have more income, are simply more bankable. Thus the private sector, the private financiers come in and lend to them because they're more bankable and the project simply picks up and moves someplace else and replicates that way.

We also consider donor expansion or expansion through donor funding – which is interesting, but as you've heard earlier today and in other venues there's simply not enough donor money available to address any one of the significant challenges that face the world let alone the incredibly complex issues of food security.

So the key takeaway message is to all of you who are Australian agribusinesses. We know that you are incredibly strong throughout the value chain, you have incredible knowledge and research; we're inviting you to think about how you might want to engage with Grow Asia, engage with our country partnerships, to think about what role Australian businesses can have in effecting food security while still growing your markets. We really see this a commercial proposition for you and we're hoping that Grow Asia can be a conduit that can help facilitate your participation. Thank you.

Alison Eskesen is Director, Knowledge and Accountability with Grow Asia. She is a seasoned international development executive working 16 years at the intersection of development and finance. In over 30 countries worldwide, she has built a track record of measurable results by cultivating strategic partnerships among governments, private banks, foundations and impact investors.

Previously Alison was Director of Research and Programs at Impact Investment Shujog, where she oversaw the day-to-day operations and growth of Shujog. This included measuring the impact of organisations, providing leadership on the design and implementation of technical assistance programs, and contributing as a principal researcher on commissioned papers. Alison has spent the majority of her career at the U.S. Agency for International Development (USAID), where she mobilised domestic capital for local development projects by structuring and negotiating innovative financing mechanisms. She headed the business development team with a total portfolio of \$2.8 billion. While at USAID Alison also created and managed development programs that strengthened urban governance and facilitated slum upgrading.

Alison has also traded fixed income securities, fundraised for a New York State non-government organisation, and consulted for the United Nations Development Programme and the Rockefeller Foundation. She holds an MA from Columbia University and a BA from Colgate University. She was also a Fulbright Scholar in Paraguay.

Integrating public and private sector research goals for sustainable food security

Martin Kropff

Director General, International Maize and Wheat Improvement Centre
(CIMMYT)

Abstract



Our ability to deliver food security to the world's poor in a sustainable way depends on three converging global challenges: climate change, population growth, and limited available natural resources. Understanding the severity of these challenges, and the actions that must be taken to successfully tackle them, is high on the international research agenda. Although the future is uncertain, it is possible to construct a range of likely scenarios, which are determined by a number of factors. This paper discusses changing trends, and provides recommendations for one of the principal factors driving the future of development: investments in international agricultural research.

CIMMYT contributes to sustainable agriculture, rural development, and value chains for maize and wheat agri-food systems, with projects in more than 50 countries. Although most research has long been funded by public sector donors and philanthropic foundations, cooperation with the private agricultural industry is increasingly necessary to achieve desired development impacts. More specifically, cooperation between public and private sector institutions is essential to develop and utilize new technologies that address current and future food security challenges. Delivering joint, high-quality research will not only improve food products for clients and build farmers' capacity, but also ensure that all partners benefit from cost-sharing and complementary technical expertise in precompetitive domains. Research will remain an academic undertaking, unless it is informed by real problems on farms and efforts are made to deliver solutions to real users. As compared to the traditional, separated approach, public-private collaborations will have the greatest impact on both agricultural productivity and long-term food security.

Introduction

The world's food production must double by 2050 in order to feed the expected two billion additional people on the planet. Moreover, they must be able to achieve this while also coping with increasingly severe resource scarcity. Water supply and access is a specific problem: in some areas of the planet, the amount of water being used every year exceeds the amount available by 54 times. Tackling these challenges requires a joint effort between the public and private sectors in research and development. The value chain development model is one such approach that can engage a large number of organizations to improve

smallholders' business environments. This value chain development model continues to be an important component of the CGIAR's strategy to reduce poverty, improve food and nutrition security for health, and strengthen natural resource systems.

Agri-food systems: a framework for public-private collaboration

Let us begin with an example of a successful public-private collaboration to raise the productivity and status of the agri-food sector, an effort in which I was personally involved. Five years ago, the Dutch government earmarked its national agri-food industry as a priority sector in terms of its potential for growth. Of the 40 largest food and drink businesses in the world, 12 are established in the Netherlands or have major research and development (R&D) activities there. Public-private partnerships were at the centre of this strategy. Leaders from industry, the scientific community, and small- and medium- enterprises (SMEs) were asked to create and execute an innovation agenda with science organisations and especially with the research organisation of Wageningen UR (an organisation similar to the Commonwealth Scientific and Industrial Research Organisation [CSIRO]). As the scientific representative member of the team, I was involved in designing and executing the jointly developed agenda. We set an agenda that added value to agricultural production by internationalising and incorporating a systems approach to the agri-food industry. We were successful because we worked as one team, with a single agenda and a shared vision. When starting this process, most Dutch people didn't realise that their country is the second largest exporter of agri-food products in the world. Today, this new direction has reinvigorated agriculture, and revived people's pride in the sector.

The question now is: how we can take this vision and knowledge about public-private collaboration in the agri-food sector and apply it to agricultural research for development? One essential ingredient is the Golden Triangle of industry, government and the scientific community—or the Golden square, if including NGOs, as we at CIMMYT believe it often should. Taking inspiration from the Dutch model, this direct interaction between these actors, will help different sectors to collaborate more fully. This will result in an open and fruitful dialogue between different sectors, as opposed to the status quo, where

scientists talk only to scientists, and industry talks only to industry. Below, I address why such an approach is necessary and beneficial to the CGIAR's and to CIMMYT's work, and provide some ideas for how public-private collaborations in agricultural investment for development can move ahead.

CIMMYT's approach

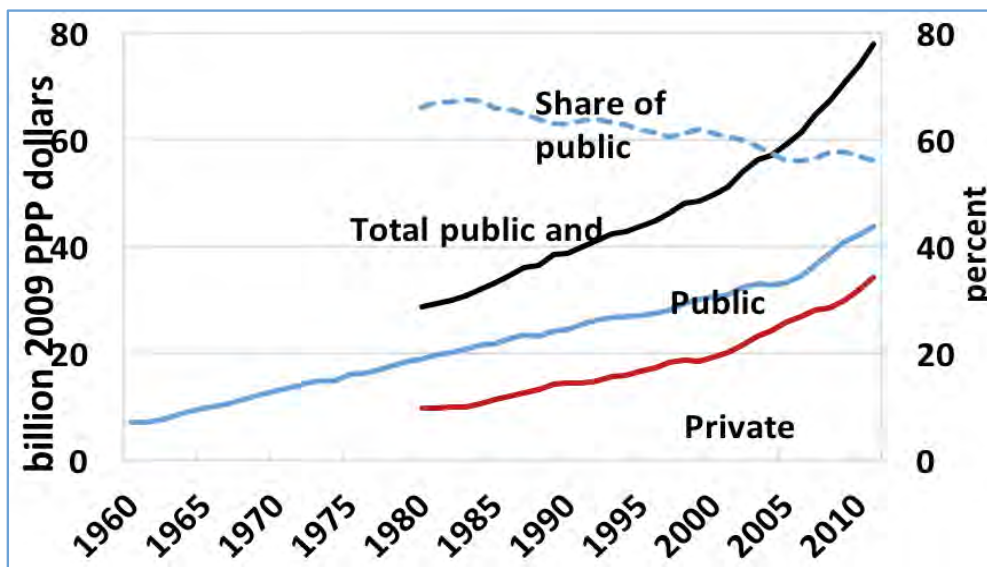
The International Maize and Wheat Improvement Center (CIMMYT) is one of the 15 Research Centers located strategically in major crop-producing regions across the globe that comprise the CGIAR. The CGIAR Centres conduct agricultural research for development, guided by a mission to achieve, by 2030, 150 million fewer hungry people, 100 million fewer poor, and 190 million less hectares of degraded land. CIMMYT has the oldest roots back to the 1950s and is the second longest-existing International CGIAR Research Center, celebrating its 50th anniversary in 2016; it is considered the birthplace of the Green Revolution due to the work of Dr Norman Borlaug to reduce the incidence of famine. Its work is focused on improving maize and wheat farming systems, including the livelihoods and wellbeing of farmers who produce these crops. In total, CIMMYT contributes to sustainable agricultural and value chain development for Agri-Food systems with projects in more than 50 countries.

While breeding is at the heart of what we do, CIMMYT is not just about breeding. That is, CIMMYT conducts its research through an incremental and balanced approach to technology and socioeconomics that achieves impacts along the value chain, from a single gene to the food that lands on our plates. We have 150,000 accessions of wheat and 28,000 of maize in our Genebank, have developed novel tools and traits for highly effective breeding, and use predictive economics to target our research on the most likely future development challenges. We must maintain and continue to strengthen these approaches to consistently achieve our demonstrated impacts. Attracting more and new sources of investment is key to this strategy, but the funding climate is in flux, creating challenges for the sustainability of our projects.

The changing global landscape for agricultural R&D

The CGIAR is a relatively small organisation on the global playing field, with only \$1 billion invested across 15 agricultural research centres worldwide. In 2011, this was only 0.86 per cent of global food and agricultural research and development (R&D), and just 0.047 per cent of all R&D. However, its research has had a major impact, such as in wheat where 60% of the varieties in the world are derived from CIMMYT material. What's more, the CGIAR is encountering a changing global landscape regarding the composition of players in agricultural R&D, in terms of both major country donors and the balance of public and private funds. There are several notable recent trends in the composition of agricultural R&D funds (Fig. 1), which create challenges for the CGIAR, as explained below.

Figure 1. Public and private agricultural R&D, 1960–2010.



Source: Pardey et al. 2015.

The first trend is that public spending on agricultural R&D is on the decline. That is, the total investments of traditional donor countries (i.e. wealthier nations) in agricultural research are decreasing. There are multiple explanations for this pattern. One is economic crisis and fiscal austerity in recent years, which places mounting pressure on donors to invest in national organisations rather than international ones – for example Horizon 2020 and Newton Fund. Moreover, in this context, conservative governments in several key donor countries (e.g. Australia,

Canada, the Netherlands) have merged development into trade or foreign affairs departments and restricted international aid. Another major explanation is that wealthy country donors' investment priorities are shifting from agricultural development to health. These changing priorities of donors are particularly detrimental to agricultural research, which requires long-term planning with stable funding to bring new projects from the lab, to field tests, and farmers over a period of time.

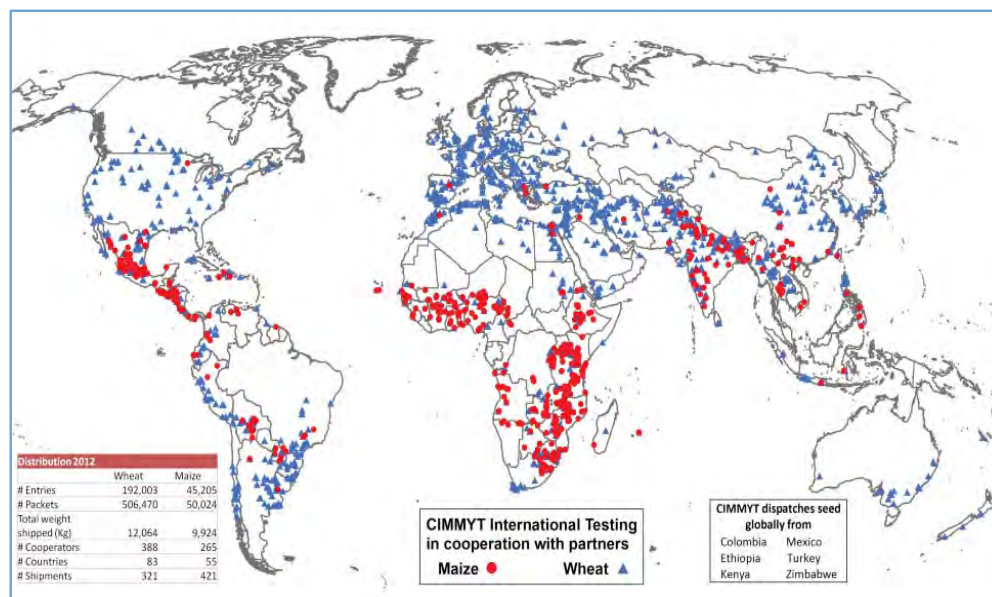
However, emerging economies are playing a greater role. Currently, China, India and Brazil account for 35.8% of global food and agricultural R&D (Pardey et al. 2015). This creates the opportunity for new partnerships, where donor countries are also immediate beneficiaries of agricultural R&D. There is also an opportunity to collaborate where lower-income and emerging economies are funding their own development projects – such as in India, Iran, Mexico and Nigeria. Some of these countries likewise demonstrate interest in funding projects with their very low-income neighbour countries.

The second trend in the global agricultural R&D landscape is that the private share of total agricultural R&D is on the rise. With this comes a new orientation towards food processing and purchased inputs, rather than farm productivity alone, as has often been funders' main focus in the past. This creates a significant opportunity for CGIAR Centres to bring badly needed market integration and value chain development projects to fruition.

Agricultural R&D: high-impact investing

Investment in research and development may be low in the public sector, but the return on investment is high. It has been calculated that for every US\$1 invested in the CGIAR the return on investments is US\$17. Investments are particularly high-impact in those countries that need development support for smallholder farmers. CIMMYT maize and wheat varieties are routinely requested by and distributed to institutions in countries that are inhabited by over 98% of all poor (see Fig. 2), proving tremendous coverage and impact pathways for two of the world's main food crops that lead back to CIMMYT breeding programs.

Figure 2. Global distribution of CIMMYT maize and wheat varieties.



Source: CIMMYT Seed Distribution Unit. (Please note this graph may underestimate the number of locations due to missing data from partners).

The impacts of investing in agricultural science are extensive when the work is scaled up and out. There are few examples of investments in science that can deliver a return on investment comparable to that of CIMMYT wheat breeding. For example, 59% of all wheat varietal releases between 1994 and 2014 are CGIAR-related (Baum et al. 2015). Additional annual production due to international wheat improvement research has been estimated to range from 24 million to 65 million tonnes per year. Moreover, in a recent study, US\$30 million per year given to wheat and breeding research at CIMMYT generated a worldwide return on investment of US\$2–5 billion annually (US 2010 dollars).

These impressive figures further indicate that, while at CIMMYT our goal is to help people living in poverty, there are also spillover effects that are benefiting developed countries. Australia has received significant benefits from CIMMYT work (Brennan and Quade 2004). Its researchers receive many of the 500,000 packets of seed sent to researchers worldwide from CIMMYT's Genebank. Up to 98% of Australia's wheat is derived from CIMMYT varieties – increasing the value of outputs from the Australian wheat industry by at least \$A750 million.

A challenge now for CIMMYT is to look beyond maize and wheat to entire farming systems and along value chains. Maize and wheat each function within complex natural and socio-economic systems, and to be effective our scientists must work in inter-disciplinary partnerships that consider such factors as the other crops, landscape, resource availability, farm size, production technologies, and gendered production roles that these systems encompass. The second round of proposals for the CGIAR Portfolio has been organised around four Global Integrating Programs to help achieve this. These cross-cutting programs are: Agriculture for Nutrition and Health; Climate Change, Agriculture and Food Security; Policies, Institutions and Markets; and Water, Land and Ecosystems. In addition to closer systems-level cooperation, closer integration with the private sector will also be required to continue achieving high-impact research at the systems and value chain levels. However, this necessity comes up against significant historical disagreements between the sectors.

Challenges to establishing public-private partnerships in agricultural R&D

It is often pointed out that the public and private sectors differ in fundamental ways, and these have sometimes hindered their cooperation in agricultural investments. These can be summarised in terms of a desire for exclusivity within the private sector, versus the goal of inclusivity in the public sector. This difference can result in competing views in areas such as the distribution of gains from research outcomes, and on ownership of scientific knowledge and technology. Moreover, there are misconceptions and mistrust between the two sectors that present a cultural and ideological barrier to cooperation. That is, it is often wrongly assumed that the public sector only gives everything away, while the private sector only wants to make a profit.

Finding a mutual way forward will continue to be difficult, but not impossible. There is a key overlapping interest between the two sectors: both public and private sector investors are interested in making technologies available for developing countries. The private sector does this through competition, and engages in research that will result in products that appeal to customers with high purchasing powers. Public

sector investors tend to cater to end-users with more limited purchasing power. The common ground between them is their interest in serving emerging markets, and in finding new applications for research for multiple end-users. The CGIAR is in a prime position to link their interests and ensure shared goals are met.

Finding common ground in technology development

Cooperation between public and private sector institutions to develop new technologies is essential to address current and future food security challenges. Delivering joint high-quality research will improve products for consumers, and build capacity for farmers (many of whom are also consumers). What's more, cost-sharing in precompetitive domains also ensures that all partners benefit from a greater total investment and technical expertise.

Returning to the Netherlands example, common ground was found in pre-competitive research, where Unilever and other large companies worked together with science organisations such as Wageningen UR on new technologies that were in a too-early stage for an individual company with an R&D division. At the same time co-innovation projects with SMEs (Small-Medium Enterprises) were supported in large public private partnerships with a focus on innovative processes that cannot be initiated by the SMEs without an R&D division. At CIMMYT we do this in the frame of a wide range of cutting-edge projects, including for unlocking the genetic diversity contained in our genebanks and for substantially raising the yield barrier in wheat. We can continue to capitalise on the recent surge in interest from the private sector in wheat improvement technologies, including from Syngenta, CSIRO-Bayer, Pioneer ACPFG and many more.

There are significant benefits to both sectors in taking such an approach. The private sector gains access to farmers in emerging markets, although they must work hard to line up their new business. They also gain the opportunities to wield influence in the development of legal and regulatory regimes, and to participate in pro-poor research fora. Companies can also improve their corporate profiles, reputations and build up trust with the public – in the multiple collaborations I have undertaken with executives in the agri-food sector, they have

demonstrated that they take sustainability seriously. Thus industry not only has a lot more opportunity but also more public responsibility today than it did 30 years ago.

Through collaboration, the public sector also gains access to new mechanisms for developing, marketing and distributing products and financial resources. New access to cutting-edge scientific expertise is especially important because, in many instances, their investment in research is small compared with that of companies. By working with industry they can gain access to those technologies and knowledge.

The need for collaboration

The challenges for both the CGIAR and national agricultural research systems are to work further and farther along the value chain, for which they need private sector collaboration. As national extension systems decline in size and importance and as industry plays an increasingly important role in the farmer outreach scene, it will be imperative for their activities to become better aligned.

As one example, the impact of CIMMYT germplasm is enhanced through the private sector's participation. National and international agricultural research system breeders can conduct testing and registration, but small- and medium- sized companies can greatly improve efficiency in bringing seed to farmers. Seed companies can work with extension agents (private and public) on seed production, and on promotion and marketing, to deliver CIMMYT-improved seed to smallholders and help them improve their competitiveness. CIMMYT is currently working on developing partnerships of this nature, with a special focus on developing the commercial attractiveness of the project to help ensure its long-term sustainability.

Given the complexity of the process, entrepreneurship is needed – not only from the large, but also from small and medium enterprises (SMEs). This is because of their different time horizons: large companies with shareholders believe that the time lags for a return in some markets (such as seeds) take too long. In the Dutch collaboration cited above, it was a Dutch-owned family seed company, Rijk Zwaan, that made the decision to invest in Tanzania, because larger companies with

shareholders would not accept the 15-year time-horizon before the venture would become profitable. Furthermore, this small family-owned company had a social responsibility and development support mission, which would be impossible to develop in a shareholder model.

In Africa, CIMMYT is building up seed sectors with small companies. Furthermore, smaller companies might be better integrated and trusted in markets that are otherwise difficult to access. On the other hand, local seed companies might suffer from high operating costs, limited access to quality foundation seed, and a lack of trained personnel. Thus researchers and their public and private sector collaborators must work with a number of business models, market strategies and forms of chain coordination to offer the flexibility needed in seed markets comprised mainly of smallholders. Given the importance of affordability, access, and availability, science organisations have good reason to continue trying to support small and medium enterprises.

The ‘Triple Win’

Australia is one of CIMMYT’s largest financial supporters in funding breeding and sustainable intensification research. This partnership, and others like it, pose a ‘triple win’ by creating benefits for donor countries, for people living in poverty, and for development cooperation. For donors, as cited above, a key outcome of Australia’s investment in CIMMYT is the contribution of our research and development outputs to Australian farming and the Australian economy. That benefit has been passed along to the world’s poor, who include to smallholder farmers, who now have varieties that give better yields, and the urban poor, who benefit from prices that are kept low. Finally, such benefits extend throughout society, considering how in 2008 the steep rise in food prices led to widespread rioting in many places, and that food insecurity is one contributing factor to the contemporary global migration crisis. In other words, the third win of a successful development cooperation is social stability at a broad level.

Concluding thoughts

The agricultural sector kick-starts economic development. This is the case not only in developing countries, but also in developed countries facing economic pressures. In the Netherlands in 2008, the only stable

sector was the agri-food sector, making it a focal point for the government. However, the lesson from the Dutch experience is that agriculture can only work as an economic engine insofar as people are proud of its contributions to their society, which encourages investment, consumption, and involvement in the export sector. This is the so-called ‘agri-food sector link-up’, and it can create the Triple Win discussed above. This requires both innovative ideas, and putting these ideas into practice at scale. For this to work, government must link not only with industry but also with NGOs and other organisations—the golden square.

Approaches are needed from multiple actors that are both multidisciplinary and interdisciplinary. Important elements are feedback, networking, reflecting, and, of course, dreaming. It’s important that companies and people have dreams, looking forward to not only a brighter tomorrow, but a brighter future 20 years from now.

Agriculture is strong on the agenda in Australia. The country must evaluate its priorities and determine where agricultural research for development will lie in the future. It could provide leadership for CIMMYT research on wheat breeding, for example, because it had a tremendous impact on Australia’s own wheat sector. Australia has an opportunity to take the lead particularly because the interest of in funding CGIAR breeding research is diminishing, despite their significant development impact and return on investment.

In summary, we cannot work in silos, but rather must come together in an interdisciplinary and trans-sectoral way. A great company and well-intentioned government are essential ingredients, but they have to work together to achieve a truly beneficial outcome—a Triple Win for donors, the world’s poor, and global society.

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Dr Martin Kropff became Director General of International Maize and Wheat Improvement Centre (CIMMYT) in June 2015. He was formerly Rector Magnificus and Vice Chairman of the Executive Board of Wageningen University and Research Center (Wageningen UR) in the Netherlands. He obtained his Bachelor's and Master's degrees in biology at Utrecht University and a PhD in agricultural and environmental sciences at Wageningen University, both cum laude. In 1984, he was appointed assistant professor at Wageningen University. From 1990 to 1995 he was the systems agronomist at the International Rice Research Institute (IRRI) in the Philippines, where he led an interdisciplinary program on the introduction of systems analysis and simulation in rice production research. Upon his return to the Netherlands in 1995 he served successively as Full Professor of Crop and Weed Ecology, Scientific Director of the University's C.T. de Wit Graduate School for Production Ecology and Resource Conservation and Director General of the Plant Sciences Group. In 2005 he joined the Executive Board of Wageningen UR. He played a key role in raising the university's profile worldwide. In 2013, he joined the CGIAR Consortium Board, where he worked to improve cohesion and develop a new CGIAR strategy.

AFTERNOON KEYNOTE ADDRESS

Being engaged, profitably and sustainably, from farmer to market

Chris Brett

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Abstract



The role of the smallholder in supplying national and international products is significant, particularly as populations and markets are continually increasing. In emerging economies many governments are now under-resourced and direct support to smallholders has reduced; this has directly resulted in yield and quality decline and continual soil degradation. Olam, like others, is dependent on smallholder supply chains for many of the products within the businesses we operate. In response, the role of the private sector in supply chains has progressively changed over the past 10 years, taking up the role of delivering extension-based services to smallholder farmers so they can continually rise to the challenge of the growing markets. Olam has invested heavily in supplying technical training support, inputs and finance to ensure our supply chains are continually developing through increased integration with our farmers to ensure these important supply chains are not put at risk. Olam's model is to invest in processing units and then build the community farmer-based supply chains to keep that processing unit fully operational.

I will start with a quick overview of Olam International, how we operate then explain our role in food security, how do we link to smallholder farmers. Olam is a multinational agri-business company listed in Singapore. Interestingly the company started its business in 1989 in Nigeria, so Africa is very much still a large portfolio of the company. But the company has expanded across several major products. We're a very diverse agricultural business, most people actually say we're the most diverse agricultural business in the world compared with peers such as Cargill, Dreyfus, Bunge and ADM (Fig. 1).

So we try and display the company here on five what we call major platforms. We have a lot of work in edible nuts, spices and beans – and edible nuts, spices and beans of course takes us all over the world, particularly the fact that we're here in Australia with our almond

Figure 1. Olam has a diverse agricultural portfolio.



production. We're also diverse across India, Africa and so on in the other nut categories. Then we're also very much involved in the coffee and the cocoa space and I'm sure you can appreciate a lot of these products are very smallholder driven. I want to talk about how we develop those relationships with smallholders in the next few slides.

We have also set up a very large packaged food and food staple business which is basically selling into Africa and Asia. We're not selling a lot of packaged foods into the more developed economies but we specialise in the emerging economies and that's a very interesting part of our business model because our objective is to deliver high volume low cost food into these major economies and particularly into the urban environments as well. Then our last category in terms of production is our industrial raw materials where we're looking at natural fibres where of course we're doing a long of cotton. Cotton of course is globally we operate but of course a big portfolio there in Australia after taking over Queensland Cotton in 2007.

We also do a lot of work in the rubber and wood products division. Then we also have a commodity financial services unit based out of India. And we also have our packaged food fertilisers business as well. So that's just giving you an example of our breadth in portfolio in agribusiness. This

next slide (Fig. 2) shows how we operate across the supply chain, because supply chains are much more complex than many people can

Figure 2. An outline of Olam's value chain.



sort of reach and understand. So on the left hand said we have what we call selective upstream areas where Olam is actually operating in the supply chain. Olam is a significant corporate farmer across the world and we're producing in tree crops, we have annual crops, we have dairy farming and we have our forestry concessions.

Just in terms of scale the current Olam portfolio is, we're operating across 2.1 million hectares of land globally which is under leasing agreements. And I do stress that word leasing because obviously we're involved in Africa, Asia, Australia, USA and Latin America in a lot of land operations; and these are all under leasing agreements with governments and so on. So that's 2.1 million hectares of highly invested upstream business in quite a broad portfolio.

Olam's core business

Then the core business of Olam is this supply chain segment in the middle where we're looking at how we source from smallholders and how we source from large scale contracted producers and how we're basically part of this large scale trading network. When we map Olam what's been interesting for me in my job role is really looking at number

one, how we do our business in terms of our corporate responsibility but also of course how we build these long term sustainable supply chains. When we map our supply chains we're actually linked to 3.9 million smallholder farmers across the world.

And we've calculated that at every single one of our origin countries where we're producing these products, for example we're active in 28 African countries, we're active over Asia, we're active over Latin America and of course the U.S. and Australia. When we link to our farmers and you start seeing 3.9 million that's a huge portfolio where we are now, developing stronger and stronger linkages to those 3.9 million of which 350,000 farmers are now fully recorded and traceable to Olam. Where we're offering services and so on, which I'll talk about on another slide, also importantly we develop linkages to the other farmers thorough market access agreements, a much looser input supply, financing and so on. But the main challenge of supply chains is how you work closer and improve your linkage to those smallholders.

Investment in processing

Then the last segment is the area that Olam's invested in hugely over the last, I would say eight years, which is basically about processing. We now have 135 global processing units which we've built all over the world, particularly now we are building them closer to the production segment of the supply chain. So our business objective is to basically build a processing unit then build a supply chain around that processing unit. So that can work with a cashew processing plant in Cote d'Ivoire where we build a plant that can process 30,000 tonnes cashew then we build a network of 40,000 farmers within a 200 kilometre radius of the processing unit to build that product for our business. This of course also happens in our coffee processing, cocoa processing, wheat milling and so on.

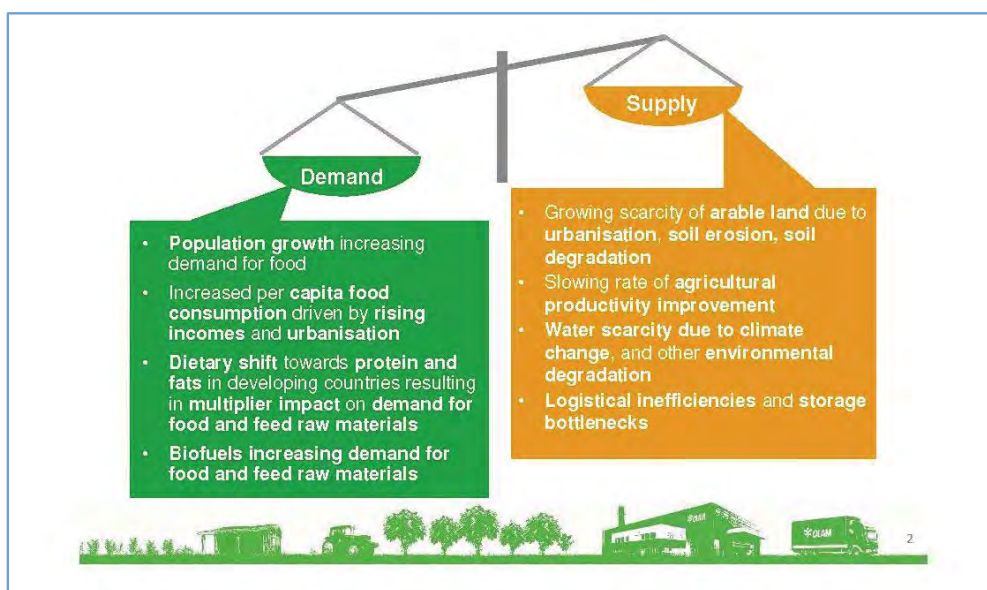
So it's all very much about integration, building the supply chains to be closer and closer to the factory. This improves a lot of logistics, a lot of efficiency, its obviously reducing our carbon footprint hugely as we knock down this product from a raw material into a processed item and then we sell it to our customer. So if you look at Olam and you said who is a customer, a customer of Olam is typically a Unilever, a Nestle, a

Mars, a Costco, General Mills, Kraft etc., as well as multitudes of smaller customers. We link now to between 12,500 and 13,000 global customers, bringing all of these products through the supply chain.

In the last year we handled 15 million tonnes of products which came from a land footprint of 11.8 million hectares. And I think that's an important area to understand, and this is where we're working a lot with governments and other partners, is that we are directly responsible for 2.1 million hectares. But what are we doing about the environmental and social risk of managing all this other land where we're working with producers on their own land, how do we influence them to improve their productivity, and of course contribute to the national/international food security?

This is just a very quick sort of snapshot and I won't dwell on this but I'm sure you can appreciate that as we're going forward in this world we are really struggling on these demand/supply ratios (Fig. 3). We are now in a situation where a lot of our products, and I'm not sure if you follow the cocoa markets but cocoa is a product which is progressively moving into deficit. And also we're seeing a lot of deficits in other commodities where we have a lot of competition in the change in the commodity cycles.

Figure 3. The growing imbalance between supply and demand for agri-commodities.



The four 'Fs'

For example at Olam we study every day the four 'Fs', F number one is food for human consumption, number two F is food for animal feed consumption, number three of course is fibre and number four is fuel. So when we talk now in events like this we're trying to get people to really understand that agriculture is about energy, it's not about food now, it's not about producing food and fibre, it's producing energy. Last year in the U.S. more than 50 per cent of the corn produced was consumed in the fuel market, it went to ethanol. And this is very strongly happening across the world where we're seeing a lot of agricultural products being diverted for fuel and coming out of the agricultural markets.

This is also another issue where there is competition for these products to meet, a lot of government commitments – for instance in Europe five per cent of fuel has to be from non-fossil fuel sources so the only option is to turn to agriculture to find that five per cent. And this is also happening, I'm sure you're aware, across the world where agriculture is completely shifting in its pattern. And we're also seeing vast amounts of agriculture products going into animal feed, which of course is to feed the growing meat markets of India and China, where we're now seeing a lot of agricultural products being required. This is leading to a lot of inefficiency as grains are being converted into meat production then to human consumption instead of being for direct human consumption.

Then the other areas that we talk to with governments are all the problems we have on logistics and infrastructure. I'm of course on the back foot joining this conference because I'm not sure what you've spoken about earlier in the day, but from an Olam point of view we have huge inefficiencies in ports, roads, infrastructure, water distribution and electricity.

Managing the business

For Olam as we go forward, in the job role I'm working with with all of our teams globally, we look at these seven key areas which we have a

huge interest in because I'm going to use the expression material areas (Fig. 4). These areas are material to how we manage our business. So

Figure 4. Seven environmental and social focus areas.

Area	Pledge
 Land	Selecting and managing land responsibly
 Water	Responsible use of water for our own needs without impacting the needs of others
 Climate change	Adapting to climate risks and opportunities for Olam and communities
 Livelihoods	Supporting thriving communities
 Labour	Providing a safe workplace where everyone's rights are respected
 Food security	Improving access to affordable food
 Food safety	Improving food safety and quality across our business

obviously you can see on the slide that we're looking at land as a key area and I've mentioned that already. Water I'm sure that you can agree is a huge issue to agriculture and of course Australia is really expert on how to manage water as a resource. And I have to say we're learning tremendously with our colleagues in Australia and we transfer the learnings from Australia into a lot of our agricultural supply chains – for example, how to apply irrigated water into coffee plantations in Tanzania and Zambia, how to irrigate in Nigerian rice farms, and how to support smallholders in water management.

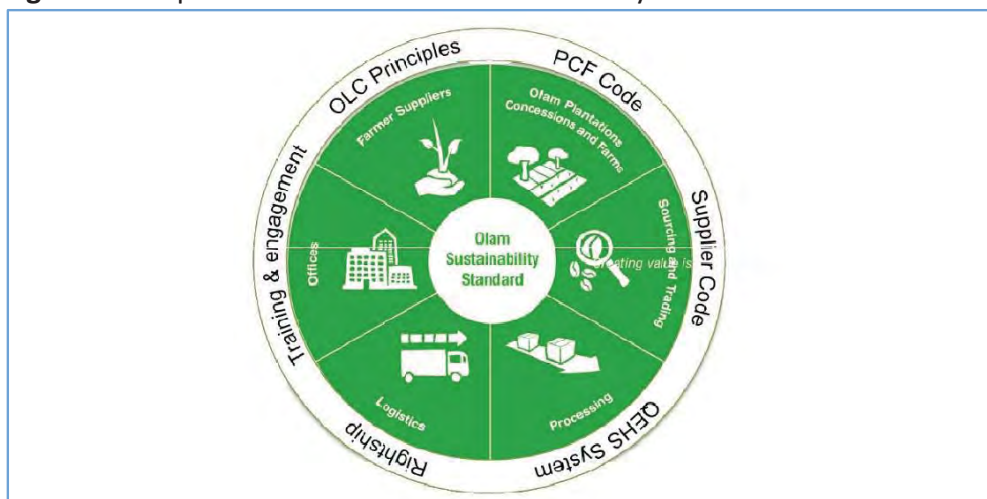
Then of course we're following constantly the climate change debate and how we build adaptive strategies within our smallholder networks. How we look at reforestation, how we're looking at shade trees, how we're looking at basically moisture conservation, improvement in soil to retain that moisture. And the biggest I'm going to say 'threat' to Olam is basically about livelihoods. When we go around the world and you're in Africa, you're in Asia, what is sad is that many people you talk about in the smallholder networks quite frankly don't want to be farmers and they're discouraging their children to be farmers. There is a direct association with agriculture and poverty in many of these countries. So we're working really hard on how we improve those communities, how we look for inclusive growth, how we look at improving community

infrastructure through education, health, water, how we work with donors, how we work with governments to stabilise these agricultural communities.

Then of course labour is a big issue. Olam has 23,000 full time employees but we have up to 40,000 casual seasonal workers working across our networks across the world, across the growing season. Then of course food security has a large impact on companies that are working in all of these emerging economies and quite frankly emerged economies, where we're very much part of the food security. How we build food security and good nutritional standards to these communities, how we improve not only cash crops but how we also improve food crops to these communities so people are contributing to both national and international food security. And then the last area is food safety because we are bringing products, food products into the market.

Just basically I'm sure that when you look at all this you think: how do you actually communicate sustainability, what is the depth? I get very tired of the over-use of the word sustainable. Everything is supposed to be sustainable. What does that mean? Well for Olam you know we set up this sustainability standard (Fig. 5). Our number one challenge was to actually drive awareness internally. Olam is present in 65 countries, we have about 260 companies, subsidiaries within Olam. So how do we actually work and drive sustainability?

Figure 5. A representation of Olam's sustainability standard.



In Olam when you get people who work in supply chains, we get staff that work in our own land management issues, our own plantations and farming businesses, we also have a lot of direct linkage with the smallholders, we have lots of staff working in our processing units, we're also looking at how we manage logistics and also how we train and engage staff across the network.

So this is our sustainability standard where we someone 'what business do you work in?' and if they say 'I work in plantations' then we put them straight away into the Olam plantations, concessions and farms category. Here they come under what we call our *Olam Plantation, Concessions and Farms Code* and we can educate or train people on how their understanding is on environmental management and social management, how we integrate with communities where our plantations are set, how we develop food security to our plantation workers and communities within that area.

So this is just a way of basically bringing our systems and processes together, how we monitor our environmental impacts and social impacts, how we also report. We're always under huge pressure from our investors, from our customers, shareholders and also from our financiers and of course the non-government organisations that we work with; we also need to monitor what agribusinesses are doing. So reporting has become a big issue on companies, how we can display and show transparency and how we can show tractability of supply chain.

Olam's livelihood charter

So coming toward sort of the end of this presentation, because I was told to be brief, we've developed in Olam what we call the *Olam Livelihood Charter* (Fig. 6). I want to dwell on this just for a few minutes because this is how we connect to our smallholder farmers. Now Olam is a business but we've also become a very strong private sector development partner, building partnerships with donors. We have very strong relationships and projects, programs working with USAID in countries like Nigeria, Burundi, Egypt, all over the world.

We also work with the Gates Foundation on a lot of the product that they're interested in and the Gates Foundation is a very strong partner to the private sector. We also do an incredible number of commercial

Figure 6. Olam's livelihood charter.



partnerships with our customers and the reason is that a lot of our customers are feeling threatened by their supply chain so they say how can we invest at the beginning of the supply chain rather than just be a buyer from a company like Olam.

So we've built a considerable infrastructure to link to these smallholder farmers. So we look at eight very distinct principles, we look at how do we manage the finance of these small holders, how do we actually improve their yield and improving yield of course is directly linking to incomes. How do we improve labour practice across the farming? We're all exposed to the risks of child labour, bad application of chemicals, bad adoptive practices in cultivation and so on. So we do a lot of work on labour practices in training our smallholders to improve their practices. Then of course we're looking at market access, how we build that linkage to give fair transparent pricing to smallholders. Then quality, how can we reward farmers for improved quality and then traceability back to that community is now an important prerequisite for our supply chains. Then as I say we look at community development, how can we

invest in those communities to improve those communities and stabilise them. And of course we look at the environmental impact.

So if we look at the next slide (Fig. 7) this is just a snapshot of numbers where you can see that we now have connected to 350,000 farmers which are on a full database. We're now producing one million tonnes of products which we are defining as sustainable through this network.

Figure 7. Highlights from the livelihood charter in 2014.



And Olam brings to market 15 million tonnes of product so one tonne is, one million tonnes is now under this smallholder network under the OLC. But I do stress we also bring RSPO certified palm, rainforest alliance cocoa, coffee, FST timer, organic products etcetera to the market as well on top of this. So one million tonnes is through this network but we bring other product as well.

We have 30 major programs running under this OLC and you can see that we paid 21 million dollars in premium. But what's more interesting for this network is understanding that we as an agricultural business put 183.7 million dollars as loans to farmers which are quote 'unbankable' by most of the banks within the countries we operate. So we're also not just a business but we're a development agency in terms of farmer training, building farmer groups. But we're also a micro-financier, when you look at a lot of these loans at \$150/\$200 that kind of network, so we built this micro-finance network across small holders. And I also stress that buying back from those smallholders costs us 487 million dollars so

its interesting when you look at cash flow and I want the conference to realise that when you start looking at cash flow smallholders it's an important aspect where we can start really understanding how we can build, basically build credit of these farmer groups or smallholders so they can develop their business.

And then lastly the next slide (Fig. 8), just going forward it shows the areas that we're very much challenged on. It is really about how we build meaningful multi-stakeholder collaboration. In Olam we've built great examples where USA is funding a good technical NGO partner helping us to train and build farmers. A donor partner would basically help a business to establish its supply chain. Olam is fully responsible for all of the processing investment. Olam is responsible for the logistics. But where it is difficult in our business model is how we fund the agricultural training, the building of farmers. How do we actually deliver these services which are a high cost in terms of how you link to the smallholders?

Figure 8. The future challenges facing Olam.

Going Forward - challenges 

Delivering small-holder sustainable supply chains will be based on multi-stakeholder collaboration. Development investments are required to promote production of all viable crops creating local **food security** and the sale of surplus food and cash crops into the national and international markets, this will include:

- donors and governments developing and applying new small-holder business models with the private sector;
- demand led research into localised varieties;
- national land registry and tenure agreements;
- small-holder farmer access to applicable financial products, both in terms of loans and viable insurance products; and
- inclusive growth through the application of technology that will link transparently farmers to markets.



So this is an area that we've been building with USAID, with the British Government, the European Union, with the foundations like Gates, IDH and so on and they like the model of what we call matching grants.

When we put a proposal together and say that budget is a \$6 million three-year investment then the actual donor partner will maybe put in \$3 million, so they'll say it's a one-to-one match or it's a two-to one-match. So we bring investment from the donors into the beginning of the supply chain to kick-start this process. And the most important thing is that after three years we use the word localised, we've localised these projects where the donor could fall out of the picture, out of the program. But the program is self-sustaining because the network is built and Olam or the other agribusiness – it's not just about Olam – is now running and embedding that system, financing the system and its up and running.

Help for orphan crops

The other area that I also stress is that we are extremely weak on research in a lot of the varieties or the crops that Olam works in. One researcher actually called them orphan crops. There's very little research into cashew, there's very little research into sesame or products like cocoa which are critical to the smallholder economies. Also we lack a lot of investment in smallholder rice, smallholder cotton and so on in the research.

And the big elephant in the room to be quite honest is all about national land registry and tenure agreements and I would really challenge people in the audience here to say how do you meaningfully engage with governments to actually develop meaningful land registers where smallholders have collateral to trade on this land, how they can build lots on this land. But importantly going forward how can we build commercially viable farms? No-one will ever convince me that if a smallholder has access to two hectares he will move out of poverty. There has got to be commercially viable farming units.

We've got to change; we've got to transform these relationships. We also have to look at how we can be innovative on financial products. Olam is financing farmers, we can't stretch to billions of dollars to finance these smallholders, we have to look at how to deliver low-cost loans more effectively to farmers with viable insurance products. There is no insurance in Africa and this is a big risk to our farmers and to our networks.

Managing technology

And the last point of course is how we manage technology. Technology is going to be the game changer. Olam is investing heavily in technology to link smallholder farmers directly to us. We have technology which is mapping the smallholder farms. And in the last year we've mapped 70,000 hectares of smallholders where we build a portfolio up with those smallholders understanding their farm, understanding their assets, understanding their social status, where they are in terms of family, farming and so on. But more importantly we map how far they are from social infrastructure, how far they are from a primary school, how far they are from a health centre, how far they are from clean, accessible water. So we map all of these products so we can help design and influence the development of those communities based on need. It's not about a whole delivered package, it's about what those communities need.

So basically, just concluding, there are great examples of good partnerships that are truly commercial. Because at the end of the day these partnerships we develop have got to work out for the market. The market is not rich in paying premiums, the market wants to buy sustainable products which are being produced effectively. So the challenge is how we can get these smallholders who are basically already on a very low base, how can we improve their productivity, how can we deliver a landscape approach to community? So companies like Olam now don't look just at cocoa, they look at maize, they look at sorghum, they look at these groups of products that the farmers are producing. But it's very hard to support the food crop side of the community, where we don't have an interest in procuring but we have an interest in stabilising the community. So on that note I'll stop, because I'm sure I've spoken enough. I look forward to any questions and joining the continued debate.

Chris Brett is the Senior Vice-President, Head of Corporate Responsibility and Sustainability at Olam International, a leading agri-business operating from seed to shelf in 65 countries, supplying food and industrial raw materials. He has global responsibility for guiding and supporting the business to further develop and integrate the environmental strategies, culture, tools and actions necessary for building end-to-end sustainable agricultural supply chains.

Q&A: AFTERNOON SESSION

Facilitator: Dr Jim Woodhill, Principal Sector Specialist, Food Security and Rural Development, Agriculture and Food Branch, Department of Foreign Affairs and Trade, including afternoon speakers, structured around direct questions from the floor

Facilitator: We now have three quarters of an hour to ask some more challenging questions about the topic of the business of sustainable food security. Just think quietly to yourself for a moment. We've heard a lot today, please just think quietly for a moment, something that has surprised you about what you've heard today. You've got 30 seconds to do that.

Now let's turn this back-to-front for a moment, just to help us get going with this discussion – which I really want to try and make as good a discussion as I can. Let's just first ask our speakers one question that they would really like to ask. So given that you're up there on the big screen Chris why don't we start with you, what's a question that you would like to ask?

A. Chris Brett (panel): My big question, and I think about this a lot. Olam's very much focused on the coming sustainable development goals launching on January the first 2016. They're obviously all agreed I mean they are quite frankly a huge shopping list of 17 major goals with hundreds of indicators and so on. So my challenge here is: we've got a 15-year period, how can we meaningfully look at goal number two food security and really dwell on that and build from it? But also goal 17 is about collaboration and partnership, how can we really look at effective partnerships to deliver these goals and with a strict focus on SDG2, food security?

Facilitator: So summarising, how do we get really serious about the sustainable development goals? Marco, what's a key question that you have after today?

A. Marco Ferroni (panel): My key question in this respect is addressed to the aid agencies, when and how are the aid agencies getting serious about agriculture in the right way? I can elaborate what I mean but I don't need to, I'm just putting it out into the room. Secondly when are our governments, and we work a lot in sub-Saharan Africa so I'm

referring to that part of the world a little bit, finally getting serious about agriculture? That's the challenge question that I would like to pose.

Facilitator: Thank you. So it's not all about business, how does the public sector also get serious? Matt?

A. Matt Willson (panel): My question would be also about collaboration and we've talked a lot about it over the last 24 hours. What are the priorities, bear in mind we need to scale up collaboration particularly here in Australia, what type of collaborations do we really need to get moving on quickly?

Facilitator: So what are the collaborations we need here in Australia? Alison?

A. Alison Eskesen (panel): I would drill down even a little bit further and say if we really are interested in partnership and collaboration within the private sector, then whose job is that, whose job description includes an indicator where they're accountable for partnership? Clearly in the NGO world and often times in government your job is around collaboration and partnership and so you have dedicated people but on the flipside how do you do that within the private sector?

Facilitator: Great, thank you Alison. Martin?

A. Martin Kropff (panel): Basically many countries are now starting with the philosophy of aid and trade. And many of the donors that I observe look at short-term impact, and short-term impact is important but the issue is basically that it's not 20–30 million people that have to be taken out of hunger, it's a huge issue in the longer term. So I think, how can we get the donors also convinced that we have to invest in the short term? When there is a problem in the country we need to do these types of things, we need such initiatives as well, but how can we get a complete pipeline so that indeed in 20 years from now hunger is out of the world, that also we invest in these longer-term things?

Facilitator: So how do we invest for the longer term?

A. Martin Kropff (panel): It's a little bit like in the Netherlands when for example we have to invest in dykes, if we don't then you know we drown and some people become fish, right? (laughter) But as long as there's 20 years with no flooding then nobody wants to fund it anymore – so you need a flooding situation and a problem to get interest again. In

the same way a lot of people don't take food security problems seriously.

Facilitator: Thank you Martin, that's an important point. We talked earlier on I think about disruptive innovation so I'm going to have a go at being disruptive for three minutes and I'm going to ask you to really be quiet after three minutes. Please talk to your little groups of three, what's a really critical question that you think we still need to be asking at the end of the day? You've got three minutes to discuss that with your neighbours.

(General discussion for several minutes)

Facilitator: Thank you, let's now have some questions! What I'm going to do is ask for set of questions that sort of link together and we'll see if we can have a few clusters of questions. So who would like to begin?

Q. (Melissa Wood): We've got two questions here, they sort of link together. It's been a really great day and we've heard all about the need for sustainable multi-stakeholder partnerships to feed the world profitably and sustainably. Lots of lessons that I think are more than we've ever heard before, lots of examples, golden triangle, and the four pathways to scaling up. So we were wondering have we got enough evidence now, do we know enough to really get serious about this and are we on the right trajectory to scale up, to linking smallholder farmers with business or is there still more to do, is there something still missing? So if we meet in another five years are we still going to be talking at this level?

And a follow-up question: I am really asking who is going to take the leadership on this, who has responsibility?

Facilitator: OK, are we on the trajectory for going to scale and who's taking the leadership on that scale? I'd like a couple more questions on basically the same theme as that. You're going to get your go Dennis.

Q. (from the floor): In our discussion we talked about how looking on a global scale doesn't get down to the point where you can get gains by looking at the big population countries where you can get a substantial gain. But there are so many small countries which are going to have a different set of problems and therefore they're not going to be able to move forward in the short term, and of course that means in the long

term as well. But talking in a global sense doesn't really get down to the problems that some countries are going to suffer for a long time.

Facilitator: OK, so the scale issues of different countries. Sorry, I'll come to this side of the room in a moment.

Q. (from the floor): We were, or I was intrigued initially by Marco's role for the market in terms of scaling up, a great mechanism. But I think one of the things that concerned us was that markets can often have market failures and often the environment is the area where failure occurs.

Now we heard also some wonderful solutions in terms of the certification schemes and the way industry is dealing this, the Unilever code and so on, but the other side of the coin was there are a lot of transaction costs in terms of bringing those to fruition and my colleague on my right pointed out that we haven't got much time because of climate change. So I guess the question is how can we bring private sector, government and smallholders together to sort of solve things which are soluble, but do it quickly and do it well and avoid the mistakes that we've made in the last 100 years of modern agriculture in the developed world.

Facilitator: OK, thank you. So let's take those three... So the question here is around scale, it's around who takes the leadership on scale, are we heading in the right sort of trajectory to do the things we need to do and are we doing that quickly enough? Marco, why don't we give you a go at this, seeing as it was your subject?

A. Marco Ferroni (panel): So are we doing enough and are we doing it quickly enough? Well the answer is no, however we have many initiatives and that is good and bad. I was impressed by what I heard from Chris (Brett) about Olam, there is a large player that can have major pull, by thinking through the elements that one needs to think about and heed in the context of an effort to link farmers to market sustainably, because we have heard the numbers that are involved.

At the same time I'm seeing a lot of projects out there, a lot of 'me too', small scale events, initiatives where people claim that they're reaching so many farmers. I normally doubt what they mean by reach, normally evaluation is in short supply and so on. And I think that there is a need for a more rigorous approach in many instances and also for coordination. We could potentially pool resources to have bigger

impacts of the kind that we have heard in Chris Brett's presentation. So that's one answer to that particular question.

I want to address if I may very briefly the other question that seems to have been directed to me, which is about markets that can have market failure. Well that's a whole discussion market failure, institutional failure. Markets that work don't fail because they work but potentially some of the regulatory environment may not be specified correctly so that you may not have the incentives to deal with all of the sustainably aspects and so on. That's a big problem that needs to be looked at specifically, value-chain by value-chain, geography by geography, farmer group by farmer group. But I want to make one statement with respect to sustainability, the first law of sustainability: is intensification OK, because intensification requires links to markets for reasons I can explain separately.

Facilitator: So Marco, you are also posing the issue if I'm correct that we actually don't know whether we're on track or not, we haven't got enough evidence and data about whether things really are heading in the right direction or not.

A. Marco Ferroni (panel): I think that's correct. There is a lot of things that are happening that are going in the right direction. This conference shows that there is a lot of consciousness on the part of people who are interested in this question, but I don't think that anybody knows whether we are really on track in a global system towards sustainable development in terms of agriculture and rural development and food supply.

Facilitator: So Matt, I mean we've got the whole WWF market transformation issue, and you're right in the middle of this, what are you seeing in terms of changing things at scale?

A. Matt Willson (panel): I think I mean firstly just on the leadership piece I think organisations have competencies and they have strategic interests in particular areas. So I don't think you can be in a situation that all companies are going to be involved in all initiatives, even though they might have some footprint. So examples like McDonald's taking a leadership position in getting global roundtable for sustainable beef set up: it obviously has a strong strategic interest in beef being one of its major products, it's got a good understanding of all the stakeholders in

the beef supply chain, understands a lot of the issues. So for me it's about companies identifying where are their natural niches, where can they actually add the value and where can they actually take a genuine leadership position. And when I say leadership I'm talking not just about seeking out the right product, but actively going out there and developing solutions in collaboration with other stakeholders.

And I suppose an add-on from that point I mean the market transformation and approach that WWF's been using is really about using the major buyers and leveraging the volume of product they purchase. So I think for me there's an opportunity, a scale opportunity to understand the commitments that companies have made around sustainable sourcing. You've seen a couple of examples of companies that have made 20/20 commitments. For me there's an opportunity there to help those companies fulfil those 20/20, 20/25 commitments, there's an opportunity there because the demand is there or at least the market signal is there. So ultimately how can you, how can we utilise those public commitments to deliver social and environmental outcomes at a local level?

Facilitator: So let me go to you up there Chris you've sort of got the poll position, you look very big in this room. I mean, are you getting to the scale, do you see things happening at the scale that is needed and maybe you might like to reflect on this leadership issue within your own company. I mean, how do you get the leadership that's needed to really change things deeply in your own business operations?

A. Chris Brett (panel): I think there are a few points here that people need to dwell on. I think number one it's about scale, you know you have to take a risk. As a business you know we've banned the word pilot, if anyone says the word pilot they get a right ticking off because we believe whether you agree or not, maybe we're being presumptuous, but we believe that we've actually developed quite a lot of models across different countries and we've learned a lot and we're scaling those models up. Because we can't spend a lot of time, a year or two or three years now on small projects or small pilots so we really do focus on scale number one.

I think the other thing is that we are spending a lot of time with national governments. I travel extensively and we spend a lot of time at the

institution, the ministry level and really working you know with the Ministry of Agriculture or the Ministry of Finance, trying to explain the position or the private sector. And we've also managed to promote quite a lot of regional discussion and there are some great practices in some countries and weak practices in others. For example I'm quite happy to say that we have a great relationship with the government of the Republic of Congo, and the government of the Democratic Republic of Congo next door is trying to develop quite a lot of the plantation businesses and they're asking for advice from the Republic of Congo and they're asking advice from the government Gabon and we're working those countries.

So I think you know the government of Australia should be looking more at this institutional development, strengthening national governments. And we talk about the enabling framework for business, its business you know under control, under controls, we can't just be let to run across countries where you can argue there's weak governance. But we want to do the right thing, we want to invest, we want to scale up and we want to bring those farmers' products into national markets and international markets.

I would like to stress that Olam does a lot of national businesses: we do rice farming in Nigeria where that rice product is for Nigeria, so it's a fully integrated market. We need to be very much working with the government on their food security policies but also on what duties they're charging for the import of chemicals, what they are charging for the importation of rice that is competing with our national rice.

Facilitator: That was great, I want to make sure we've got time to cover some key points. I actually think that's a key point you've just raised Chris, in terms of regional collaboration and working in partnership with government. I want to come to Alison in a moment, but before I do that let me come to Martin because you were also talking about the scale of issues around what research has done, I mean the critical role that the CG system can have in helping to partner with business in taking these things to scale. So from a research and a CG system perspective, how do you see the scale question?

A. Martin Kropff (panel): I think that's also why it's important if you have a global system in that sense so CGIAR and then like companies like

Olam that are really working in all these different countries can bring knowledge from one area to the other one and indeed stopping small pilots, and you can make/start initiatives. And what I said in my presentation we need to link golden triangles of the different countries, north, south. I think also in policies and governments we also have these overarching organisations such as FAO.

So I think many of the programs have to work out nationally in the end. National government makes the rules, makes decision in these kind of things. But we need international links so we need the international activities. CGIAR can't do this in isolation, NARS can't do this in isolation, National Agriculture Research Institutes but also individual companies cannot do it in isolation, so organisations must intentionally support local initiatives.

Facilitator: So Alison, let me come to you then also about the linkages between business and government in the context of Grow Asia, but particularly about where does the leadership and trust issue fit into this story of going to scale?

A. Alison Eskesen (panel): That's an incredibly hard question (laughs). I firmly believe, and I think we all firmly believe at Grow Asia, that who bears leadership or who bears responsibility and who should be the leader it should be each and every organisation, that the worst of a partnership is to look and say this is your responsibility and I'm passing it to you. Now that's not truly a partnership. Also government clearly has a role to play, whether it's enabling the framework, whether it's investing in infrastructure. Donors clearly have a role to play but so do companies and it's in the companies' commercial interest in which to engage. We believe that in some cases the answer is 'yes'.

Do we know enough how to take it to scale? If you look at the disparity between developed markets and developing countries in terms of their agricultural productivity you'll see that that information already exists, it's how do you take that information and make certain that it's disseminated and adopted in developing countries. In some cases we don't have the answer yet, but I would think that that's in the minority not the majority. And so if we start with what do we know and how can we replicate that and disseminate that in developing countries that will

go a long way in terms of achieving progress toward food security and then in addition to that thinking about innovation.

And I think about the different businesses that stood up here today to talk about their models and their approach to engaging – whether it was through partnership, whether it was through engagement of smallholder farmers, whether it was through technology transfer. Each has stated that they want to be a leader in this. I think that that's incredibly important as we think about how to achieve that balance between government and private sector and civil society.

Facilitator: Gerda, just a quick question on this topic I think to Chris.

Q. (Gerda Verburg) Good afternoon Chris, this Gerda Verburg speaking, Chair of the Committee on World Food Security, a multi-stakeholder platform. My question to you is I hope you will have a happy and healthy life for a long, long time from here but once you die what kind of legacy would you like to have?

Facilitator: What are they going to put on your tombstone Chris? And hopefully that's a long way away!

A. Chris Brett (panel): Well I hope so too! I've moved into my last decade of working life according to the U.K government, but let's see what happens in reality. I've been on a personal journey, I've worked overseas in a lot of areas for 32 years now. So I started off as a VSO, a good old platform going out as a volunteer to Nigeria on a two-year VSO program and unfortunately I left after 11 years, I forgot the two years was up!

So I've really been working in community. So my legacy would be I want to see sustained change, I want to see smallholders rise up to not just be smallholders I want to see them much more commercialised, much more entrepreneurial. I want to see smallholders grow to be managing farms of say 12 hectares. I know that's a bit of a radical statement but I think 12 hectares would be a viable commercial farming unit for many smallholders. So I think for me my legacy would be to see that sustained change on land productivity, and like Marco said it's all about productivity. You know we've got lots of land being unproductively managed so I want to see that change, that would be my legacy.

Facilitator: Great, thank you Chris. OK, let's go to some more questions. And as you listen to the question, if you've got a question that you think is on a similar topic I'd like to cluster a few topics together.

Q. (from the floor): My name is Dan Etherington and my company Kokonut Pacific was subject of a recent Landline program. We are a social enterprise, we are for profit, we are highly profitable, we focus on the coconut industry and we have our technology in a number of different countries. As a social enterprise our shareholders are not interested in cash return for their investment, rather they are interested in what we are doing. Now I see enormous companies being represented and talked about on scales that are unimaginable to me, what are your investors contributing to this? Are your investors willing that you have a real social impact? Are your investors willing to diminish their cash return for a good story?

Facilitator: OK, a really important question. Have we got any other questions around this investment idea? Here, one of our young scholars, am I correct?

Q. (from the floor): I was thinking about how the palm oil industry is really affecting the orang-utan population in Indonesia, and how organisations such as the World Wildlife Fund are ensuring the sustainability of this species, and also like why are we still using palm oil and how it relates, are investors worried about the animal populations?

Facilitator:

OK, so what's the link there between how we think about different products and what the investors want? We have one more question, right at the very back, pertaining to how we get better risk analysis – which I guess then again links to this whole investment side of things. OK, so maybe where are investors coming from, how are they driving the picture, do we see differences in different companies in terms of who sits behind them in the way they can operate, how long-term can they be thinking about? Who'd like to start off on that one? Let's go to Matt and then we'll come to you Chris.

A. Matt Willson (panel): Perhaps this is beyond investments, and we were actually! WWF strongly believes in the power of the investment community and how that can also be a lead for change. From my

experience across I suppose the range of commodities that WWF works on there's actually quite a strong correlation between productivity gains and efficiencies and sustainable outcomes from an environmental and social perspective.

So taking palm oil as an example: there's been some analysis done by WWF about a year ago looking at how the production of sustainable palm oil can reduce labour costs, because there are reduced impacts on employees from a health and safety perspective from use of pesticides, better relationships with local communities leading to less downtime at the plantation level. Actually having a healthy, well paid workforce can again improve productivity.

So it isn't always a trade-off between sustainability and production of products and profitability of profits. Ultimately I think that there's a great opportunity there and we've seen it with sugar, with palm oil, with beef, around how can that value be better monetised. So this isn't a question of should we do the right thing or should we do the profitable thing.

Facilitator: OK, so just to answer your question directly, so you're saying palm oil's not fundamentally bad?

A. Matt Willson (panel): I can answer by saying palm oil's an interesting one, especially here in Australia, because it always comes up as a question and again that links to productivity again. So I haven't got the figures with me but if you look at the yield of oil per hectare for palm oil its significantly high, you know significantly higher than some other oils (I'd be careful in saying coconut oil).

Facilitator: So let me come back to you Chris and around this investments story but also how do you sort of see that ecosystem of different sorts of companies, small, large, privately owned, on the stock exchange, how does this change the way companies do and what they can do and how they need to work together in terms of – let's even come back to the scale question?

A. Chris Brett (panel): Well firstly I love Dan Etherington's business model, I wish that I was under less pressure in terms of returns because I can assure you that our investors in Olam really are looking for a return. There are a lot of issues that people only invest in companies

which can evidence the way they do business in terms of their policies and how they develop these plantation businesses, how they develop their supply chain business. So there is a tremendous amount of pressure on us to be sustainable, but at the same time investors in a company like Olam, privately listed, do want returns comparable to other industries.

The other side that I would also stress is that there's a lot of new financial processes coming onto the market, for example green bonds where you can start looking at, they are a little bit more adventurous on financing adaptive strategies to evidence sustainability. That's another area that we're looking at as a company where green bonds would finance areas where other banks wouldn't necessarily go number one, but also number two they are starting to look at rates which are very, very slightly lower than the market.

But I would like to stress to you that Olam works with the DFIs, the development financial institutions like IFC, like Probarco, like KFWDG, you know all the European banks. The IFC, gives loans on commercial terms, they're not giving us any softer loans, the only thing that we can get as an advantage from them is that we can get grants to help fund some of the programs that they get involved in financing with us. They will finance things in a longer term than some commercial banks. So that is another area where people think that DFIs give lower or better rates – but they don't. And the other side is that commercial banks have really scaled up their policies on how they work with companies and there's a lot more auditing on companies like Olam.

And just to talk about the points of palm oil from the earlier statement. Palm oil, actually the oil from palm oil basically, one hectare of palm oil is equivalent to about seven hectares of the nearest largest production oil. So palm oil is a contentious subject but unfortunately we have to live with it because it's in many, many of the products that we're used to, and its cost advantage.

Facilitator: Great, thanks Chris. On this question about different sorts of companies and investment let me come to Martin. From your experience with the top sector in the Netherlands, where I know there's an incredible diversity of companies involved in this space from large to

small, what's been your experience of how different sorts of companies engage in this space?

A. Martin Kropff (panel): I think the key here is, and then we go to the partnerships again because of course the big companies especially have shareholders. Basically you know profit is a driving tool and if you have no clue what the trade-offs are with other trades then of course it makes for very difficult decision-making. So I think joint setting an agenda is very important, that's what we did in the top sector approach as well, and then really a joint agenda setting and also jointly looking how you can reach objectives. And sometimes as a government you have to set a standard – this is a limit for us and we don't want to go below that limit.

And then I'm going to the farming systems question as well, we need also good decision making tools from science, from the economies for example at the landscape level. So if we treat it like this and we handle it like this and so much palm oil in this area what does it mean for the other partners in the landscape and the orang-utans for example? And those types of models should not be developed by the scientists only; they have to be used by the stakeholders. Ideally when the stakeholders in such a meeting sit around the table that they see what are the trade-offs in terms of profit of the company. Companies have foundations so they want to do something, but also in terms of the different objectives that you have in a policy. And that's I think a challenge for science that we can ask, that basically the economies also must come up with.

Facilitator: So better decision-making by bringing science into decisions about trade-offs and other discussions.

A. Martin Kropff (panel): Exactly, because a lot of these decisions are now being made on the basis of emotions and people have all kind of numbers so the impact is more predictable if you have solid science. But that's a big effort; by the way you can really see what does it mean if you want to have more people in labour, more labour of people, what does it mean for, or better societal environments for labour so better salaries or what does it mean for the amount of people in all these such type of things.

Facilitator: Which comes back to the point Marco made earlier about just lacking some of the basic data and basic information for good

decision-making. Alison let me come to you because I know you've been involved a lot in a 'previous life' in sort of innovative finance thinking. What are you going to bring to Grow Asia in terms of thinking innovatively about the whole finance story behind this?

A. Alison Eskesen (panel): I think there are two things. To touch on maybe the questions and some of the points that were raised earlier, I completely agree that there is a lack of data and what we really need right now to unlock socially responsible investment, to unlock impact investment is information around what is the relationship between impact, return and risk. So if your risk goes up does that mean your impact goes up and your returns then go down or are they not diametrically opposed. And if you start to have that data what it allows all types of investors to say OK if I'm being demanded by my shareholders to be socially responsible what part of my portfolio might I look at to have investment in this and how do I balance that with other investments.

And so I think that such information is incredibly useful for all types of investors across the spectrum. And that is being said from Grow Asia and what we are thinking about is really a two-prong approach; one is thinking about innovative finance so as Chris mentioned green bonds. There's a variety of defined structures that you can engage using either the CS arm of the business or a foundation or using governments and public money. Blended financing is incredibly interesting in terms of bringing the right type of financing at the right point in the value chain. But then also really I think it's a missed opportunity if we don't think about domestic markets and domestic capital. There's an incredible amount of wealth in developing countries that resides locally; the question is how do you use that financing and engage that financing for the development of their own nations and the smallholder farmers.

Facilitator: Great, thank you. I haven't given you a go this time Marco but I'll come to you on the next round. Somebody here was really trying desperately to catch my eye so we'll go there and then take a couple of other questions.

Q. (from the floor): Lachlan Hunter here from the University of Western Australia. Thanks to the Crawford Fund for the scholarship opportunity and for Erin Pope and Ashley Ridgeway from Curtin University in Perth,

Western Australia. Our questions is quite simple, and you know there was some really great ideas throughout the day, but how do we in agricultural science and in research communicate our main messages to the general public to what we're trying to achieve?

Facilitator: Great question. Any other questions there about how do we communicate all of this?

Q. (from the floor): We're a group of young scholars as well from ANU and Sydney University. The question that we thought hadn't really been answered throughout the afternoon was how private partnerships are contributing to viewing food security in terms of access and utilisation? Because we've heard a lot about production sort of focus but not those aspects of food security which are both very important aspects.

Facilitator: Right, thank you, great question, let's take this one.

Q. (from the floor): Eric Huttner from ACIAR. This is not quite about communication but it's in the same sphere. I think the general public has some development scepticism about older registration schemes and accreditation schemes for sustainable and stewardship and fair trade, all those things, and I wonder where we could get some sort of vetting that those regulations and constraints we place on smallholder producers to match them are actually beneficial for them. I'm sorry to bring in a pretty contentious topic but remember that McDonald's by deciding that they would never use GM potatoes actually are depriving all the potato growers in the world of a potential innovation that could assist them tremendously.

Facilitator: OK, let's take, we've got three sort of areas there, how do we communicate the big issues, what about the access and utilisation, food security is not just about the production side and are we going crazy as consumers with a million different standards that we've no idea what they mean. Marco?

A. Marco Ferroni (panel): On communications I don't think that the record of the scientific community is sufficiently good in terms of communicating to the world some of the basic truths that are going hand-in-hand with food security which is that for example we require about agricultural technologies. I'm pretty optimistic when it comes to the large, big questions that were asked explicitly or implicitly in this

conference with respect to whether mankind is able to feed itself going forward, because there is something called human ingenuity which has saved us many times in the past and so on. But it is also true that particularly in developing countries, I'm also seeing this phenomenon in emerging middle classes in emerging markets and so on, lots of people are getting sceptical in respect to at least certain kinds of technologies that are essential in agriculture going forward.

And of course we must ask seriously the question of how we communicate; I think that there are some issues there. Clearly in that period that I have been working at Syngenta Foundation the whole question about GM, GMO technology has become much more polarised and much more negative in the last number of years than it was maybe in the middle of previous decade and so on. We need to ask the question about that because I would not suggest that we can possibly take biotechnology off of the collection of tools that we have in terms of technologies in agriculture, it's got to stay there. And I think with respect to Eric's point, yes that technophobia can deprive farmers of important markets and therefore sources of real development, sources of more equitable inter-sectoral growth and development and income distribution in the economy as we go forward if you look it over the medium to longer term of 20 to 30 years. Technology is essential and there is a communication aspect.

The other aspect that I find is having some negative consequences or at least is influencing the debate in not necessarily productive ways in addition to the issue of technophobia is what I call peasant romanticism and I referred to it a little bit implicitly in my presentation. It's not helpful if people view small-scale farmers from a perspective of quaintness, anthropological quaintness, as OK because poverty is quaint. Well it is not if you ask them, and we've got to begin to understand that these people are entrepreneurs, small as they may be, they may not be able to take many risks because they're poor and that's why we need to come in with the enablers, some of which I have tried to explain to you. So those are my observations, and there is a communications dimension in all of these.

Facilitator: So with this lack of romanticisation it sounds like your headstone's going to be very close to Chris's.

A. Marco Ferroni (panel): Yes I think so.

Facilitator: Martin, a very good question has been raised, we had a lot of discussion about the production and the tackling food security and perhaps we haven't said enough today about the utilisation and the access. You had a very nice colourful picture at the end of your presentation about how everything comes together, what's your answer to this?

A. Martin Kropff (panel): I think that's key. And it's also why we have to link it up with the markets and that's why we have to have public-private partnerships, because if you just develop technologies its great you can have the scientists and their experiments and the models and things but the key is basically how do we get it to work. And that's also why for example in my institution we also have social scientists who have a very important role because basically the issue of access and utilisation, utilisation of course with a focus on nutrition, that gets a lot of attention these days, and that's good, that's important as well.

But in terms of access there are all these complex processes related to governance; that's also what I just said about those types of modelling because scientists especially the economists and sociologists can come up with models and calculate how things can work; but also in terms of access because you have to be so careful with scaling up. At a given stage my PhD students worked on inter-cropping high value of rice varieties, worked very well. They started scaling up and up to 300,000 farmers in China, wonderful. These farmers became rich. But then suddenly the whole market collapsed because it was too much of that product.

So you really have to think about such products; scientists and sociologists don't have to study only where things are going wrong; I challenge them in marketing to really study also why things are working. And then with the economies when you scale up, what's going to happen then? So a lot of knowledge has to be used in basically guiding these processes and helping governments to sort things out. Because we may have some interesting pilots here but how things work at the country level is very complex. And that needs attention and needs to be valued also by society.

Facilitator: Thanks Martin. We've wound everybody up a lot today, now I can see signals coming from the side that I need to wind things up. I'm sure we could go for another hour or two or three on all of this. So let me try and bring things to a close. Firstly, a quick reaction from both you Chris and from Matt about the standards and the labels and so on, where's that going? I know we could again spend the whole night on this one but a quick response from both of you. And while you're thinking about that then I'm going to ask each of our speakers to give us a sort of 30-second last key message from your perspective, from what you've been hearing this afternoon. First Chris, standards and labels.

A. Chris Brett (Panel): Just a very brief message, obviously as a company we respond to what our customers want, and our customers do vary from whether they're following a route of fair trade, a route from organic, a route from rainforest alliance. But what I've noticed in the market in particular is that we're developing two-tier markets, we're having the developed countries which are looking at certification, but then we've got these huge markets – India, China, Africa, Latin America – where quite frankly there are no certification standards. And we do see for example in cocoa that things scale up to about 20 per cent of a third party certification then they seem to just tail off. That's our experience with the market. So certification as a tool is raising the bar but it's how we bring the mass volume of a product sustainably into the market and that's what we're focusing on in Olam.

Facilitator: Great, thanks Chris! Matt?

A. Matt Willson (panel): With certification schemes: I think we can all agree there are too many labels and probably too many certification schemes. But as Chris says there's a reason for them and that's because companies are demanding them. So ultimately major corporations with brands where there's potential reputational risk issues they are seeking ways of communicating to their customers but also seeking reassurance on the nature of the products and how they've been sourced – and certification schemes provide the solution. However, they only provide a solution in certain circumstances, so I think the interesting question and the one that's not going to be resolved here is in which circumstances are certification schemes relevant, to what proportion of the market are they relevant, accepting the fact that they can exclude and they often do exclude smallholders.

Facilitator: So another area where we need to bring good science about what's actually happening with this stuff into the dialogue with a whole bunch of different players?

A. Matt Willson (panel): Absolutely!

Facilitator: Now let us wind off with a very quick message from each of you to wind up this session. Alison?

A. Alison Eskesen (panel): What I've heard and what I think all of us here have talked about, and I hope there's a fair amount of agreement, is that scale is essential. If we really want to address food security we have to be thinking about scale. We need to be thinking about how to work collaboratively, how to have ownership of different activities and how to step up and have that leadership. And that this is really an innovative alternative way to achieve systematic change in which each of us has our own role to play.

Facilitator: Thank you. Martin?

A. Martin Kropff (panel): The public-private partnerships, I think we have seen now today they are really essential. We have to use basically the policy makers for the right directions, the industry to make it happen at scale, and the science for better decision-making by developing the technology for innovation to make it possible.

Facilitator: Thank you. Let's go to you Chris.

A. Chris Brett (panel): Obviously some great comments there. I'm very, very pro-partnership. I know that Olam has a great opportunity to really influence long-term development and sustained development, but it has to be through partnerships. And I look forward to working increasingly with more partners as we go forward as a business. I also urge people in the audience to have confidence in the private sector, seeing them develop this role with governments and other partners, particularly NGOs. But I do stress it is a lot about national government development as well, they've got to be a clear partner in a lot of this work.

Facilitator: Matt?

A. Matt Willson (panel): I'll go with the collaboration piece again, I suppose my message is start thinking about who you could potentially collaborate with; all collaboration really is about identifying

competencies that you don't have within another organisation, to deliver greater value. So for me there's a collaboration opportunity across all organisations, it's just trying to identify who.

Facilitator: Thank you. And the last word Marco?

A. Marco Ferroni (panel): I want to leave the audience with the following two takeaway messages which I really have already had the opportunity to point out in my presentation. The first is the unprecedented demand growth for food that we are facing in the rest of this century, that is the wave of opportunity on the back of which we should be able to create rural development, linking farmers to markets and creating conditions on the agricultural side of things for a world in which there are ultimately fewer farmers.

There's two things that are required for that process to happen which is an epic historical process that unfolds over 100 or 200 years as it has in many of the OECD countries, which is a pull and push sort of combination. The pull combination is employment generation of good jobs; we can define what we mean by that in the farm sector. The push has to do with enabling farmers to move off of the land by means of productivity enhancement whereby in the end fewer farmers are needed to feed the population. That was the first take home message; it turned out to be too long, second one will be very short.

Markets are the vehicle for scaling up and where they don't work we know how to create them. We know how to do that, we need to do it more systemically and with more impact – perhaps covering more geographies, more value chains and so on. But it's not rocket science, we know how to do it, partnerships are the vehicle for it again and partnerships are, there is no cookbook, partnerships are specific, every single partnership is a world of its own, it needs to be negotiated, we need to go through the transaction costs that a partnership entails and so on. But it is doable if that's what you're asking me, yes, the answer is yes and I'm optimistic with respect to what we've been discussing at this conference.

Facilitator: Thank you for that optimistic close. Let's thank that audience, the panel and particularly Chris (on satellite link) for having got up at some ugly hour in the morning. You can go back to bed now Chris.

A. Chris Brett (panel): No its fine, I don't think so, I'm in the office. The day is starting, so there we go. Thank you very much for the opportunity.

CONFERENCE DELEGATES AND CRAWFORD SCHOLARS 2015

Delegates to the 2015 conference are listed below. The Crawford Fund and its supporters also sponsored 45 young Australian agricultural scientists (asterisked) to attend. This initiative supports the Fund's aim of increasing young Australian agricultural scientists' involvement in international agricultural development.

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MEDIA COVERAGE 2015

Media releases

7 August The business of food security: profitability, sustainability and risk

11 August Livestock part of the food security solution: trade and predictable science policy for innovation required – Mr Sameer Bhariok

11 August Working together towards a step-change in Asian agriculture – Ms Alison Eskesen

11 August Focusing private-public cooperation on farmers' needs – Dr Marco Ferroni

11 August Facing the uncomfortable challenge of food security – Dr Cary Fowler

11 August Collaboration essential for productivity and sustainable food security – Dr Martin Kropff

11 August Opportunities, challenges and stamina: working for farmers in Indonesia – Dr Lim Jung Lee

11 August Pushing agriculture into the stratosphere of innovation – Her Excellency Gerda Verburg

Media coverage

10 August *ABC 666* Alex Sloan interview Cary Fowler

11 August *The Australian* story Anthony Pratt

11 August *Radio National Breakfast* interview Martin Kropff

11 August *ABC Current Affairs PM* interview Gerda Verburg

11 August *Radio Australia Pacific Beat* interview Gerda Verburg

11 August *ABC News Online* interview Gerda Verburg

11 August *Devex* Overview of conference

11 August *National Rural News* (Macquarie Network broadcast to rural stations across the country) interview Martin Kropff and Matt Willson

11 August *National Community Radio Current Affairs 'The Wire'* – interview with Martin Kropff and Matt Willson

12 August *ABC TV News 24 The World* – interview with Gerda Verburg

12 August Article highlighting the future of GM crops with opinions drawn from Gerda Verburg and John Anderson – appeared in *The Land*, *Farmer Weekly WA*, *Nth Queensland Register*, *Stock and Land Victoria*, *Stock Journal SA*

13 August *Genetic Literacy* article: 'Australian senators support GMOs as environmentally friendly, scientifically sound' – opinions of Gerda Verburg and John Anderson

14 August Opinion piece Anthony Pratt 'Safe food an asset' – appeared in *The Land*, *Farmer Weekly WA*, *Nth Queensland Register*, *Stock and Land Victoria*, *Stock Journal SA*

19 August *Wimmera Times* – Cary Fowler interview

21 August *ABC TV One Plus One* – Cary Fowler interview



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