



TRANSCRIPT SPEECH OLIVIER DE SCHUTTER 22 FEBRUARY 2014

Okay, so, dear colleagues, ladies and gentlemen, dear students, dear friends, let me begin by recalling that we inherit from food systems that were shaped in the 1960's to respond to very different questions than those we have today. In the 1960s, the fear was that we would not have enough food to feed the growing population. And most of the choices that were made then, and that is when, as you know, the common agricultural policy in particular was imagined and developed. At the time, it was a growing population that was the concern and the priority was to boost production at all costs in order to respond to this growing demand.

The growth of the population at the time was 2.1% per year increase in global population. It's today about 1.4%. The growth of the population now is much less important than it was at the time. At the time, there were some 3.5 billion people on Earth, half the number than we have today, but it was rising fast and in many regions of the world agricultural productivity was stagnant, it was not improving significantly and there was a big fear that this was the challenge to be faced.

And so we developed systems that try to reward large scale efficiency gains, economies of scale and increased production as their key objective. And measured by their own standards that was extremely successful. Over the past 50 years, agricultural productivity has increased by 2.1% per year, without interruption over the past 50 years. We manage today to feed more or less double the population we had in 1955 whilst the surface of land cultivated has only increased by 12%. So we have been extremely good at meeting this challenge of increasing production to satisfy growing demand.

But this one big thing we succeeded now should not lead us to admit that we have failed in many other respects, on many other issues. And if we take a retrospective look at what was achieved over the past 60 years, really, since the birth of this productiveness paradigm in Europe, we see that on 4-5 key areas we've really been missing other targets because they were not paid attention to as they should have.

And firstly, let me recall the figures we still have on hunger and malnutrition. For those of you who follow the developments within the UN, you will know, probably, that the FAO estimates today that the number of hungry people is about 850 million people on Earth and that is indeed what is the estimate in most recent *State of Food and Security* that the FAO publishes every year together with IFAD and the World Food Program.

In fact, this is a very serious underestimation of the reality of hunger in the world. And the reason for this is that this figure, 850 million people, is one that only takes into account

undernutrition for 12 months throughout the year, when in fact most of the hunger today is seasonal in nature. It is hunger that results from many families in the Global South cultivating small plots of land, trying to stock food for some months to go through most of the year but than in March/April, or if the harvest has been very poor in February already, begins the lean season until the next harvest and it is this seasonal hunger that is primarily responsible for people being undernourished which is not measured by data that look at the full year.

Secondly, this data from the FAO do not take into account undernourishment for some family members because of inequities within the household. These data are based on household level data so that, for example, in South Asia all the discrimination that women and girls face in access to food because they eat after the others and because they sacrifice themselves in times of crisis, these victims of hunger are not accounted for in this count.

And thirdly, the data of the FAO presume that the needs of an adult are equivalent to about 2400 kilocalories per day, which is what we need when we lead sedentary life styles, rather than performing physically demanding labour. But many very poor people actually do perform physically demanding labour and would need to have a higher number of calories per day in order to be able to continue to lead these active lives.

The real estimate of hunger is much higher, I think it probably is around 1.2 or 1.3 billion people. And so, despite all the hopes that the recent statistics have given some agencies, it is simply not true that hunger has been significantly reduced and certainly not reduced to any acceptable level.

Secondly, hunger as undernourishment, as a lack of calorie intake is not anymore the most important problem of malnutrition, more largely understood. And in fact our systems have developed to provide a large amount of cheap calories to people who can afford them but they have underestimated completely the health impacts of our ways of producing, processing and distributing food.

In fact, the major problem of today, of malnutrition, is the problem of micronutrient deficiency. With large populations suffering from a deficit in iron, deficits in vitamins A and C, deficits in zinc, deficits in iodine, for example, resulting in many children having impaired growth with intellectual and physical disabilities that result and a greater vulnerability to diseases because of the inadequacy of the diets that they are fed.

And, in fact, this second failure of the food systems that have developed translating to vast numbers of people that, even though they may have enough calories absorbed per day, do not absorb the right things, do not have enough of the essential micronutrients. And that is malnutrition as has been developing in the Global South over the years.

Thirdly, at the same time that we have not reduced hunger as significantly as we should have, we have developed food systems that have made people sick in rich countries and increasingly in emerging economies. We have today 1.4 billion people on earth that are overweight or obese, 400 million that are obese and in countries such as Mexico and the US more than one third of the adult population is suffering from obesity. And obesity means shorter lives, it means the risk of developing type II diabetes, it means being at greater risk of cardio vascular diseases, it means being at greater risk of gastro intestinal cancers.

And to a large extent this again is because we have developed agricultural policies that were dissociated from health policies and we've not been paying attention to this impact on health of our ways of producing and processing food. So, even from the pure point of view of hunger and malnutrition these food systems have failed us despite the appearance of success of the paradigm that we have inherited from.

Secondly, these food systems have been developing without much regard, frankly, for the environmental impacts that they have caused. There are many such environmental impacts. Reduced biodiversity as a result of the spread of monocultures that has been documented as one of the key reasons why we've reduced agro biodiversity in the past as a result of focusing on some basic productions: wheat, maize, soybean, rice, potato and not much of anything else. So, reduced biodiversity is one result of the food systems that have developed.

The second impact is, of course, the contribution of industrial ways of producing food to greenhouse gas emissions. Today, it is estimated that agriculture is responsible for 13.5% of man-made greenhouse gas emissions, primarily the result of the use of nitrogen-based fertilisers. And, as a result, nitrous oxide is being expelled in the atmosphere in large quantities. In addition, methane is produced from industrial livestock production and by rice paddies. But if we take into account not just what happens on the field, in the farms but also deforestation to create pastures and cultures, also the energy that goes into mechanisation of food production, into the production of artificial inputs, energy that goes into the packaging of foods, the transport of foods over long distances and especially the processing of foods to transform raw agricultural commodities into edible and eatable food stuffs, then we arrive at the conclusion that food systems as they have developed are probably representing 33-35% of total manmade greenhouse gas emissions.

Parts of these impacts have to do with the very significant growth of meat production and meat consumption. In the early 1960s, we were producing some 160 million tons of meat. We today are producing some 280 million tons of meat for the global population and it is anticipated by the experts that if we follow a business as usual scenario we will be probably producing some 450 million tons of meat by 2050.

Now this is not a sustainable way of using the resources that we have at our disposal. It takes some 16 calories of cereals, you know this, to produce one calorie of beef, 15,000 litres of water to produce one kilogram of beef. Some meats are more sustainable in the way they are produced, and indeed poultry should not be confused with red meat, for example, but industrial livestock production in the scale it has reached today has a huge imprint on the use of resources. And, to take just one example to illustrate this further, the import of soybean by the EU to feed cattle in the EU represents the equivalent in surface of land concerned of 20 million hectares of land. This is virtual land that we have been capturing to satisfy our taste for meat in the EU.

Now of course not all countries are in the same situation and the diversity is very remarkable across the world. Meat consumption in the US, in New Zealand, in Australia is about 120 kilograms per year per person, it's about 75-80 kilograms per year per person in the European countries, a bit less in Brazil and Argentina, it's 61 kilograms in China where it's rising very fast as a result of the emergence of the middle class there. But it's 11 or 12 kilograms per year per person in many sub-Saharan African countries and it's 5 kilograms in India.

Scientists tell us that for meat consumption to be sustainable for a population of 7 billion we would need to have an average consumption of 35 kilograms per year per person. Today the average consumption per year per person is 42, but of course with huge differences between the richer, most affluent regions and the poorest regions. But I believe that this challenge that livestock, industrial livestock production, poses to the use of resources has been unnoticed until recently and certainly should be acted upon.

Another way in which the food systems we have inherited from have failed us is because they have failed to take into account the distributional concerns, in other terms, the social equity requirements in the food systems. What has happened? In a nutshell, we can summarise the story as follows. Production has increased very significantly thanks to technological advances in the '60s throughout the '70s, '80s and '90s. I told you that this was the story of permanent success in increasing production in many regions of the world. But this went hand in hand with a specialisation of different regions in the production of different commodities and it went hand in hand with overproduction in some regions leading to the global markets being dumped large volumes of commodities that destroyed the local markets in many developing countries.

These developing countries in the '60s and '70s gradually reduced and then completely abandoned investments in local food production. Yes, they continued to invest in producing for export and they did produce cacao, coffee, rubber, cotton, tobacco and so forth in order to satisfy the tastes of rich consumers in OECD countries and in order to reimburse their public debt. But they gradually stopped investing in the work of small farmers trying to feed the local communities with millet, with sorghum, with sweet potato.

And why is that? Well simply because these farmers had no voice in the political system, they were not interesting to support because they were not a source of public revenue for the state since they were making so little money that they could not be taxed. And it was very convenient for these countries to continue to rely on ever more imports from the global markets in order to satisfy the demand for cheap affordable food for the growing urban populations that were migrating from the country side.

So these countries, I'm speaking here of many of the poor, least developed countries, have fallen into a trap, they are now caught in a vicious cycle. They have imported more and more of the food that they consumed and as a result they were less and less able and, indeed encouraged, to invest in local production and their small farmers migrated in ever greater numbers to the cities where they came to grow the slums of the large cities from Jakarta to Khartoum and from Lagos to Khartoum.

And these cities were overwhelmed, the public services were unable to satisfy the needs for these growing urban populations and the wages were too low for these people to eat decently unless the government continued to import large amounts of heavily subsidised foods that we in the OECD countries were producing, creating a dependency of these countries on our own export led agriculture. This is the vicious cycle that these countries have been caught into and it is the key explanation for the growth of rural poverty in many developing countries, for the growth of inequalities in rural areas, and for ultimately the inability for many developing countries to feed their population.

The reason why they do not feed their population well enough is because the incomes that the farmers were getting for their work was insufficient, leading any to abandon farming and those who remain in farming often being relegated to subsistence agriculture.

So, let me suggest that the choices made in the '50s and '60s, when the focus was on producing more to satisfy growing demand, were choices that were based on a set of questions that were perhaps valid back then but are not the questions we have to ask today for the 21st century. And today the problem is not just to produce enough to satisfy growing demand. In fact, we today produce the equivalent of 4800 kilocalories per day per person, twice what we need to feed a population of 7 billion.

The problem is twofold, first much of what we produce is actually not going to the consumers because of the huge waste and inefficiencies in the food systems, and I'll return to this issue. And secondly, the purchasing power of the large part of the population is too low, too weak for them to be able to afford the food that is there, that is available, there is plenty of it but they do not have access to it because their wages are insufficient or because the revenues they get from farming are not enough.

So we need to move in a different direction and I would propose that there are three key directions in which we should transform the food systems and in which we should accelerate the transition.

First, we need to move to sustainable food systems in the way food is produced. I told you about the environmental impacts of agro-industrial means of production on greenhouse gas emissions, on the loss of biodiversity. I could have mentioned the damage caused to the soil by monocultures and by the overuse of certain soils – in many cases as a result of farmers not practicing diversified types of farming that can replenish the soils by using the right combination of crops. Well, we must change this, and there are ways to change this. In my mandates I have tried to put forward the alternative of agro-ecology as an alternative to high external input food systems that depend on the ever greater injection of nitrogen based fertilisers and pesticides to maintain the existing levels of production.

And agro-ecology is often misunderstood for organic farming or even worse, for a return to traditional ways of practicing farming. It is not about traditional ways of practicing farming, and it is not equivalent to organic agriculture that receives a label for not using any external input. Agro-ecology is common sense, it is looking at nature, trying to understand how it works, how the complementarities exist between plants, trees and animals and reconstituting at the level of the farm these very complementarities that exist in nature between the different components of natural systems. It means understanding the complexity of how nature works and, rather than simplify the work of the farmer, it means making the work more knowledge intensive, more demanding in a way, but at the same time more rewarding for those who practice it. And agro-ecology is important to support for a number of reasons.

First, because it delinks food production from the use of fossil energies. And today we have food systems that are very highly dependant on high volumes of energy and that have grown to depend on fossil fuels for the production of fertilisers and for the processing, packaging and transport of food over long distances. This cannot continue in a time of peak oil and peak gas and we need to find ways to work with nature instead of working against nature and that is what agro-ecology is about. The first argument in favour of agro-ecology is an argument that concerns the resilience of food systems and that delinking from fossil energies.

Secondly, agro-ecology is important because it is a way to maintain and improve soil health. By the right combination of plants, by using animals in order to fertilise the soils in combination with the use of leguminous plants and trees that can capture the nitrogen with their leaves and re-inject them in the soils, we can reduce our need for nitrogen based fertilisers and we can preserve the health of the soil much better. By planting trees, agro-forestry, which is also one agro-ecological technique, we can allow the soil to capture the moisture better, we can reduce erosion and we can create shade for the plants so that the droughts that will be ever more important and have ever greater impacts on the food systems in the future can have (*incomprehensible, perhaps limited impacts*) [? 00:40:33] as a result.

Thirdly, agro-ecology is important because it's a low cost way of producing food. And for poor farmers living in remote areas, working on marginal soils, not certain whether they can mortgage their land to have access to credit, it is very important that they learn about techniques that can allow them to produce more for less, invest less in food production, to depend less ultimately on the market for their ability to capture a decent profit for their production.

It is, in other terms, a way to avoid a double dependency for farmers, and I should borrow from the very important work of my friend Jan Douwe van der Ploeg on this issue, they get rid of a double dependency. Dependency on inputs that they pay for as a price to farm and dependency on outputs because the more you have pay for your inputs and the more you depend on producing what the market demands in order to be able to continue to produce. Agro-ecology, if you wish, has a conception of farming that is much more cyclical than it is linear. It is not based on the industrial paradigm of inputs being provided in a chain and one output being produced, the rest being waste. It is cyclical, by encouraging the recycling of waste, by encouraging the local production of inputs and by emphasising reduced dependency on markets at both ends of the food production chain.

So this is one first priority, in my view, to move toward sustainable production by encouraging agro-ecology. Yes, there are many obstacles, there are many cultural barriers to this. The shift from input-intensive to knowledge-intensive agriculture is one that will not expand markets for the input providers but it is a shift that we must make because otherwise in the face of crisis, in the face of climate change and peak oil, we will have no choice but to improvise solutions.

Secondly, we must move to sustainable consumption. And for many years the issue of sustainable consumption was not considered a priority, it was almost a taboo. And, in fact in the history of the UN negotiations, it is fair to say that whilst in the 1970s there was an understanding that our ecological footprint would depend on the combination of three factors, two of these factors had been gradually omitted.

What was the understanding? The understanding was that the ecological footprint that we were having would depend on a combination of population growth, increased incomes and consumption and thirdly, the technologies that we use that may be more or less clean, more or less green and may have a more or less great impact on maintaining the ecosystems. But demographic growth was not a welcome topic to be discussed for many developing countries who feared that they would be accused of having still high fertility rates. And unsustainable levels of consumption was not a welcome topic for rich countries who did not want to be accused of using, for the maintenance of the lifestyles of the most affluent parts of the world, the resources on which others depend.

And so what was left was just technology. And that is how green growth emerged, this belief that sustainable development can depend entirely on technology, on finding the right technological solutions instead of having to revise our lifestyles. I believe that our lifestyles have to be questioned in a context in which the planet has grown as it has in terms of population and in which incomes of large parts of the developing world have been rising so significantly in recent years. For example, I do think that our current levels of consumption of meat are not sustainable given the huge impact they have on the use of land and water in the Global South. Nor do I think that our demand for agrofuels that are now putting a very strong pressure on land and water, again in the Global South, should be very significantly re-examined and perhaps we should move away from this encouragement of developing countries to develop ever more export led agriculture to satisfy our needs.

Think about this. The only reason why we consume as much meat, the only reason why we can afford to have our cars run on agrofuels is because we are much richer than the poor populations in the South who depend on these very same resources to satisfy not luxury tastes, but basic needs, essential for their survival. And today, in markets that are increasingly globalised, in which land and water have become commodities that are essentially traded, albeit virtually, across borders, that question of sustainable consumption is one that we have to put back on the international agenda.

A third direction in which we should reform the food systems is in addressing much more decisively the question of wastes and inefficiencies in the food systems. Every year we lose about 1.3 billion tons of foodstuffs, 1.3 billion. Now this is, of course, an abstract figure but to give you one point of comparison, we produce every year between 2.3, mostly 2.4 billion tons of cereals. In other terms, we waste, we spoil, more than one half in volume of the cereals that we produce. That is extremely significant. And of course the reasons for this are different from region to region, from country to country. In Sub-Saharan Africa, in South Asia, households waste about, or rather individual consumers waste about 9-10 kilograms per year of edible foodstuffs. In our countries we waste about 95 kilograms per year per person, that is the estimate for the average EU consumer.

In the Global South, most of the waste that we find happening, happens at field level. People grow crops, but they are not well connected to markets. There is no local processing of the raw commodities that is possible. The harvest is made, but the crops never reach the consumer because they are spoiled because they cannot be transported in time to the markets, because of the poor quality of the roads for example. Or because the farmers are not sufficiently well organised to have a truck to transport the crops where they can be sold. As a result they underinvest in farming and they do not produce to the full extent of their potential. That is the key problem in developing countries, where about 650 million tons of agricultural commodities are wasted every year as a result.

In our countries, the main problems are in the food processing chains, at the level of the retailers and in families. In households where we buy large portions of food but never eat them until the time arrives when the food is not edible anymore and the expiry date has been reached. We could, and indeed, we should, do much more to tackle this issue. It is simply not acceptable that we continue to focus on increasing production at all costs when we do not see that 30% of what we produce is lost when it could be spared or saved for consumption.

A fourth direction in which we must move is in reducing poverty. Now here is the most difficult change to be made because the reforms in the North are interdependent with the reforms in the South. Let me explain. I told you that one key reason why rural poverty in the Global South could not be reduced well is because we had developed an export led agriculture on which many poor countries have come to depend. This is what might be called an addiction to cheap food for least developed countries. Cheap food, subsidised by OECD taxpayer's money.

This addiction is one that is very difficult for these countries to get rid off. And of course we must move away from export led agriculture in the North. We must reduce our tendency to overproduce and to subsidise in ways that result in dumping food on global markets. But we should be aware that in the South, many governments still depend on these very same imports to feed their populations. Why? Well, because for these governments providing cheap food on local markets was a substitute for robust social protection schemes. Instead of establishing social protections schemes to support access to food for the poorest, the choice was to import subsidised foodstuffs and to develop a dependency on international markets that leads many poor countries today to buy 30-35% of the food that they consume from international markets.

Moving away from this, replacing low cost food by social protection as a means to insure access to adequate food is not going to happen overnight. And at the same time that governments in the South should be encouraged to move towards social protection schemes, should be encouraged to reinvest in local production, should be encouraged to redevelop local food systems to satisfy their own needs and reduce their dependency on international markets, we in the North must move away from export led agriculture that is making it difficult and not even desirable, in fact, for governments in the South to make this transition.

But the sequencing here is very difficult to achieve. The coordination between reforms needed in the South and the reforms needed in the North is very difficult to achieve. And that transformation, although much desired and much necessary, will not be effectuated overnight.

It will also not be able to effectuate for another reason. And that is because the current system, that we have inherited from the 1960s and 1970s, is one in which a number of lock-ins have been built. And, essentially I would say there are four key obstacles that make transformation of food systems extremely difficult to succeed in doing.

First, there are what might be called socio-technical lock-ins. By this I mean that the infrastructures we have, the technologies we have, the storage facilities we have – right, the silos, the trucks, the ships – have been developed for the growth, not of food, but of agricultural commodities to satisfy the need of the food processing industry. And, there are many regions where, for example, local food processing facilities are basically absent so that farmers are encouraged to produce maize or soy bean for the food processing industry because they would not have the infrastructures required to produce anything else. So there are socio-technical lock-ins that are difficult to overcome. The investments that were made, that are now sunk investments, make a transformation very difficult for these reasons.

Secondly, there are socio-economic lock-ins. By this I mean that many actors in the food systems today have become highly dependent on how it works. And profits made are huge, in the middle of the chain; between the farmer and consumer. And those interests are very difficult to displace because of the position that they have come to occupy.

Thirdly, let us face it, there are socio-cultural obstacles. And by this I mean that we have developed a taste for heavily processed foods, for foods that are salty, that are with lots of added sugar from, in particular, high fructose corn syrup. We are used to spending little time in cooking, we are used to eating from microwavable options that we buy from the shelves at the supermarket and it will be very difficult to return to food eating habits that reward the farmers that produce not commodities for the food processing industry, but food for their communities.

So these socio-cultural obstacles are very real and, unfortunately, despite all the very interesting movements that we see in the world of consumers today where consumers demand something else than cheap food of various sorts all year round, it still is true that most people remain guided by the need to have as cheap calories as possible, as convenient to use, to prepare as possible.

How can this change? Certainly by schools, by education. Probably also by re-examining the system of subsidies and taxes, so that the low-cost food options become also the healthy options that preserve the soil and the environment. But for the moment, all the incentives point towards the continuation of our eating habits that reward the food processing industries supply.

So we have socio-technical, socio-economic and socio-cultural obstacles and then we have a fourth lock-in that is the socio-political obstacles that we face in making reform. In fact, the systems that have developed, are dominated by a relatively small number of major actors who, thanks to networks effects and economies of scale, have succeeded in establishing dominant positions that make it very difficult to circumvent these actors in any significant transformation of the food systems. In other terms, these actors exercise veto power on any significant change in food systems.

This is why food democracy is important. Food democracy at three levels. First, at the local level where local food systems must be rebuilt, where consumers should team with producers, teaming with local authorities, municipalities, to re-imagine the food systems on which local communities depend. This means establishing a link between food producers and food consumers that is based on something else than price and markets. That is based on a direct relationship in which they can reflectively think about the food system that has developed and how it can be made it more sustainable, more rewarding for the producer, healthier for the consumer, affordable for the consumer at the same time, and better for the soils and the ecosystem.

This is not utopian. It can be done, but it requires that we democratise food systems at local level to find local solutions. And I believe that the development of food policy councils that has taken place in Canada since the early 1990s and the US is a phenomenon that should now develop also in Europe to build this food democracy from the bottom up and to re-establish these local food systems beginning, for example, with school canteens sourcing from local producers who produce in ways that are environmentally sustainable.

We also need food democracy at the level of the state or at the level of the EU, in our region. Why? This is because we have certain agricultural policies but we have no food policies. And think about what our ministries of agriculture have been doing. They sometimes make us think of this ministry that George Orwell had imagined in his book *1984*, he had imagined a Ministry of Plenty. Well, we need not Ministries of Plenty, we need

Ministries of Well-being. And we need public policies that are not agricultural policies but food policies that integrate social protection, health, environment, and food production agriculture. It makes no sense to discuss agriculture without also discussing these other dimensions. Not only must we move from agricultural policies to food policies, we also must do so in ways that are participatory, in ways that can avoid these policies being shaped by only the needs of the big players in the industry who are best equipped to lobby the policies that are developed for their benefit.

We need to democratise how food policies are being shaped and this can be done by establishing, again, participatory bodies at state level, at national level, within parliaments or at the level of the EU. So that consumers, different parts of the farming community, retailers, food processors, can work with governments to move towards more sustainable food systems. This is something that is done in some countries, it is a phenomenon that is developing, these food councils at national level. It is something that should now happen also in Europe, but it requires that we make this a political priority.

And then, food democracy is not only needed at local and national level, but also at international level. We have for many years developed agricultural policies at global level and trade policies at global level that were not accountable to the populations. And we have a system of governance of food security at global level that is very fragmented. Different fora work on agriculture, on trade, on environmental issues, on climate change, without these fora being well connected to one another and without the challenges faced in each of these areas being related to what is done in the other areas.

And this, I think, should stop. And there is an attempt to do this, as many of you will know. In November 2009, the Committee on World Food Security was reformed in order not only to have governments work together, to shape solutions for global food security, but also to have them listen to what others have to say about the obstacles that they face and the proposals they have to make. In the Committee on World Food Security you have international agencies, including the World Bank, the World Trade Organization, the IMF and of course all the major organisations that work on food agriculture, FAO, IFAD, World Food Program, and others. But you also have the private sector, you have farmers' organisations, you have civil society organisations more generally and they work together to shape a consensus on what is needed at global level to have sustainable food systems develop.

The Committee on World Food Security is meant to be the place where consistency, coherence, is achieved between trade, agriculture, climate change and all issues that have to do with moving towards sustainable food systems. The difficulty, however, is that the CFS has recommendations adopted that, although they have a very strong legitimacy and have a very important moral weight, are not always well implemented by governments, and that some areas seem to be off limits for the CFS because many governments do not want the CFS to adjust them. First and foremost amongst these areas is trade. Trade remains an issue that is dealt within the World Trade Organization and there is no serious attempt to link negotiations that take place within the World Trade Organization on agricultural commodities to global food security concerns or indeed to other concerns that have to do with sustainable food systems.

So we need democracy at all levels. We need to recapture the food systems in order to move away from the current inertia of the food systems that were shaped fifty years ago to respond to a very different set of questions than those that we have to answer today. With this I would like to thank you and I welcome your questions.