



DEBATE

Meir SHEETRIT, Member of the Israeli Knesset for the Kadima Party

I would like to say that we do not have to wait until we have nine billion people in order to see the problems we are going to have with food. Even today we have people who are starving to death in Somalia in Africa, and in other places in the world billions of people do not have access to clean water or regular food. We are far away from saying to ourselves that we can supply enough food for all those who need it.

The price of food is going up; I do not know what it is like in your country, but the average price of food is going up all the time, making it much more difficult for people to get food. Thirdly, the damage the population of the world is doing to nature is creating a lot of difficulties for food creation in the future. For example, the fact is that total populations of fish have vanished from different parts of the ocean because of damage, excessive fishing in those areas and other things. Further, pollution in the water creates a situation where small plants which create 50% of the world's oxygen are in the sea; that is the only place they can receive enough sunlight so that photosynthesis can occur, they can inhale CO₂ and exhale oxygen. Because of the pollution a lot of these are dying, and this creates problems for fish which live on those fauna for food, so populations of fish are vanishing.

What we have to deal with, and I only mentioned a few of the problems, means that it is necessary to invest much more money, as our colleague from Brazil said, and not just basic research but R&D in all the areas of agricultural wildlife. Just to use the Israel example, in the 1950s 20% of people in Israel were working in agriculture; today fewer than 1% are working in agriculture, of course producing much more in terms of quantity than we used to in the 1950s-1960s, because we use a lot of scientific and other methods in order to improve the possibility of creating food.

I think research is very important in many areas of agriculture. My colleague from Brazil mentioned genetics, and it is very important. What they are doing in the Volcani Institute in Israel is just miraculous. For example, if we can today develop a kind of tomato which lasts for 3-4 months on the shelf instead of 2-3 weeks, it means that you can use these tomatoes in the markets for a much longer time. Genetics can change the resistance of different fruits and vegetables to all kinds of chemicals. Genetics can develop totally new kinds of fruits and vegetables, with different colours, and other possibilities.

There is a lot of research being done in water. Water is one of the issues which have to be dealt with very seriously. Take the deserts of the world. I will use the example of Egypt. Egypt is a great country with a huge surface area; they have the Nile and the Aswan Lake, with huge quantities of water, but in the meantime nobody is taking the water from where it is and bringing it to the desert to make it into agricultural land. That cannot be done by private citizens, by the local farmer; it must be done by governments.

Take Saudi Arabia, which is totally desert; the fine thing about desert in my opinion is that it offers the future possibility of creating food. There are water technologies; there are new technologies like condensing water from the air, even in desert, by using machinery which may be expensive today but which exists. It is a fact, not theory. Therefore, water could be a tool for doubling the available land for producing food, and this could be done if governments put money, initiative and research into it.

Last but not least, the fact that you research and find something is not enough; the question is how you transfer that knowledge to the farmer downstairs. It is not happening today, and in many countries it is not happening at all; if a farmer hears something he might be able to buy something and make it a success, but there needs to be a logistical process to transfer what is discovered by science to the farmer, and many countries do not have this. We developed a system in Israel which gives guidance for farmers who work in certain areas about all the new technologies in terms of



water, irrigation, seeds etc., so they can go straight to the field. We also bring to Israel thousands of people from various parts of the world every year, and holding courses of one or two months to teach the use of these technologies, but this is a drop in the ocean.

We need to find a way to transfer the knowledge from institutions and technology to the people in the field, and give it for free, because these farmers cannot buy it, they do not have the money to pay for it, and that is what governments could contribute to these people. This kind of cooperation between science, governments and farmers might be able to change the situation; otherwise I am afraid we will find ourselves in a situation where the population of the world will be increasing and we will have a very big problem.

I read last week that they have discovered a new planet outside our galaxy which is bigger than the earth, has a very good climate and maybe even water. The problem is that in order to arrive there we would have to travel 600 light years. That means the distance light travels in 600 years; as you know, light travels 300,000 km in one second. Someone will arrive there in 600 years, but in the meantime there is one world which belongs to all of us, and in my opinion we need international cooperation to deal with those issues on an international basis and to create better possibilities of food for the future.

Mostafa TERRAB, Chairman & CEO of OCP Group

I have two pieces of good news for you. We can travel faster than the speed of light now, and there is also phosphate on that planet.

Philippe CHALMIN, Professor at the University of Paris-Dauphine

It was fascinating to listen to our Brazilian and Israeli friends. I would have loved them to come to the French parliament on Tuesday, where we had a debate on what they call sustainable agriculture, and the debate was largely dominated by our friends from Friends of the Earth, Greenpeace, and greens of every kind. Unfortunately, in the old world of Europe, the good farmer is, as Louise said, the traditional small farmer, and eventually organic farming without any phosphate. However, I think it is important to see that in anything we will be able to say in this kind of conference, in next year's conference etc., we have to take into account that public opinion, especially in Europe and in the US, is more and more dominated by backward looking people.

I remember the High Council on Biotechnologies in France. All GMOs are forbidden in France, and six months before the presidential elections, no party, whether on the right or the left, would have the political courage to allow GMOs in France. Austria is also a country which prohibits GMOs. I have a question for Mr. Qu. I am not very clear about China's position on GMOs. Are GMOs being developed in China? I had heard that you were quite advanced as far as GMOs are concerned, but on the other side some Chinese ministers have said they do not want GMOs. That is the first point I wanted to make.

The second point is that we have not mentioned the G20, and that it was a success and a failure. It was a success because everybody spoke of agriculture, but it was a failure because no decisions were taken as far as price stability was concerned. What is interesting is that in this World Policy Conference, I have not heard, either today or yesterday, the word WTO. We said we should solve the Doha problem. Do you really think we will be able to do it?

Mostafa TERRAB, Chairman & CEO of OCP Group

I could not help noticing that you associated phosphate with non-organic agriculture; phosphate is natural, but it is when you synthesize fertiliser one can then make that claim.



Philippe CHALMIN, Professor at the University of Paris-Dauphine

I know, but greens and people looking at organic farming see phosphate as a kind of artificial fertiliser.

Mostafa TERRAB, Chairman & CEO of OCP Group

This is the problem for them; they do not know what they are missing.

Jean-Claude MEYER, Vice Chairman of Rothschild Europe

I would like to ask the panellist whether he believes that the Brazilian PROALCOOL plan still makes sense when it has found so much oil in the Campos area and elsewhere.

Mostafa TERRAB, Chairman & CEO of OCP Group

This is the broader issue of biofuels, but I will let him react on this.

Jean-Yves CARFANTAN, Senior Consultant, AgroBrasConsult

Food security claims to keep in mind two main points, first that most of the soil reservoir for feeding the population is located in wet tropical lands, especially in Africa, and these soils do not have the same behaviour as soils in Europe, where you cannot apply the same techniques without destroying the soil; you can add a lot of phosphorous without destroying African soils. However, the main problem is not situated here.

The second point is to have more investment, as underlined in Brazil, in education, research, and innovation, and of course transferring results to the farmers as soon as possible, but not as engineers are now doing, meaning not just considering soils as a chemical box. Finally, I would just say that GMOs cover not much less than 10% of crop land today, and even if forbidden in France and other countries, there is real scientific progress.

Cullen HENDRIX, Research Associate at the Peterson Institute for International Economics

I wanted to pick up on one of the earlier comments regarding aggregate food availability. Louise, in one of your comments you suggested that we will be able to feed the coming nine billion people. I want to argue that we could have fed the existing number of people in 2008: just as an empirical matter, the aggregate food availability per capita was higher in 2008 than it had been at any time in the last 50 years. Therefore, the real question is whether we are going to continue to divert a fairly large portion of our world cereal production into biofuels, or whether or not we are going to give up on what I believe to be a fundamentally misguided policy.

Therefore, as a practical matter, since 2000 the amount of food, both cereals and meat, has increased in per capita terms. I think this is why it is important to distinguish between food availability and food access. The first simply refers to the amount of food available in a market; obviously aggregate production shortfalls, perhaps caused by drought, flooding or crop failure, make food scarcer and thus can cause acute food security. Access, however, at the individual or household level, is a function of the family's ability to pay for or produce food, and the presence or absence of social safety nets that can provide access for those who cannot pay.



Therefore, it is possible that chronic food insecurity, which is the type of food insecurity you are referencing when you talk about a billion people who are undernourished, can coexist with very high levels of aggregate food production. 65% of the world's chronically food insecure people live in seven countries: Bangladesh, China, the DRC, Ethiopia, India, Indonesia and Pakistan. Prior to the 2007-2008 food price crisis, all but China were actually net exporters of food. This is why safety nets are very important, and policy interventions specifically need to be designed to cover those households and individuals who are most insecure. The big problem with food insecurity is the same problem it has been since time immemorial: it is a problem of poverty.

That brings me to the question I wanted to pose back to Louise, who mentioned export bans. Out of all the big, intractable problems that are associated with food security, it seems that in a forum where we are discussing global governance, one of the areas that we could fruitfully tackle is this issue of export bans. This is a classic collective action problem – I am an academic, so I like talking about collective action problems – where the entire world more or less benefits from free and fluid markets for foodstuffs, but each individual country can benefit in times of scarcity or in times of crisis by closing itself off to world markets and therefore throwing the cost of adjustment back on their neighbours.

Therefore, in order for countries to put down that particular policy lever, we are going to have to come to some sort of collective decision about how to normalise food trade in a context where it is not currently normalised under the WTO. I am hoping that some of our panellists could potentially talk about what could be the appropriate venue, either in Doha or the G20, for addressing these kinds of issues.

Vijay PHADKE, Advocate registered with the Supreme Court of India

I am a lawyer and a tax adviser, and certainly not an expert on agriculture and food, but I certainly have a passion for food, and at the same time I have a great interest in food and agribusiness issues, and I have been observing it a lot, especially in my country, which is India. We have seen a lot of policy issues, which you have put across very well, such as the statistics, the Doha rounds or some other rounds. I am not talking about that aspect, but about a very practical issue which I observed in India itself. Just, going by the statistics, and taking the cue from my friend who referred to the question of availability.

There is sufficient food in India in my view, and I am sure the Indian government will equally vouch for it; there is no doubt about it. Looking at the statistics on the amount of wastage in India, and I can give you the statistics on how many millions of tonnes are eaten by rats or destroyed by the monsoon, or meat, milk, or vegetables, it amounts to not less than EUR10 billion on an annual basis. That is the kind of food which is being wasted, and which could easily have fed a large number of people in India. I am not engaged in India-bashing here, and finding a solution to that is not going to be very easy, because we also have a policy issue in India, where we import as well as export. I do not know why. I am sure other countries have the same statistics of wastage, whether in the nearby neighbourhood of China, Bangladesh, Thailand or I do not know where.

I am sure some statistics would be available to show what is wasted. Why do we not tackle the practical issues of finding some kind of mechanism in the entire food chain, right from the time you grow it until you feed people, of preserving it, storing it, supplying it, and so on? Can there be some kind of policy or some kind of debate about it? That is my practical observation.

Bouthayna IRAQUI-HOUSSAÏNI, Entrepreneur, Member of the Moroccan Parliament

Can I ask two questions concerning our country, Morocco? They might be far away from global governance but concern regional matters. Since the Morocco Green Plan has been successful, and since we have a large area open to agricultural production, do you think Morocco could become the Brazil of the Maghreb? Secondly, do you think that to



increase agricultural production in Morocco we should allow ourselves to use GMOs, since there is no debate on that point in Morocco?

Louise FRESCO, Professor at the University of Amsterdam

This is a very inspiring and rich discussion and I cannot do justice to all the comments, but let me first tackle the issue that several of you have raised, production volume versus poverty. Obviously, malnourishment is an issue of poverty, it is an issue of access to food, and the whole question is how we can improve that. This is a complex issue; it is not just a matter of lifting export bans or imposing export bans. Looking at the results of the first Green Revolution in India, that has actually lowered food prices, and the people who most benefited from it were the urban poor. Currently, 70% on average of the world's poor live in rural areas, so we have a major problem of poverty in rural areas. The solution to that is not so much to lower food prices, because that is always a temporary thing, but to provide employment and income opportunities that allow people to actually buy their food.

We have two situations where people cannot get enough food. One is the chronic poverty situations in the seven countries mentioned. India and China in particular have been particularly successful at lifting people out of poverty. The big changes to the world's hunger statistics come from the fact that there was economic development in China and India. However, there is another set of countries where hunger is chronic because there is actually not a functioning government. The situations in the Sudan, in the Horn of Africa, in the Great Lakes region in Africa, are in fact de facto situations of absent markets, absent governments, no purchasing power, and where people have been displaced systematically. I think these situations cannot be solved by any economic measures alone. They are political issues where peacekeeping is the first solution before you can do anything else.

Having said that, the question is how we deal internationally with something like import bans, or to put it differently, how do we deal with protecting the poor and the most vulnerable from food price fluctuations. I think personally that the rising price of food is not a bad thing at all. It has put the subject back on the political agenda, it is, as I said before, an opportunity for investment in agriculture which is very badly needed, but what people, the urban and rural poor and farmers, cannot deal with is price fluctuations. Therefore, if we are going to intervene in anywhere, we have to ask ourselves what are the effects of interventions not on absolute prices but on price fluctuations.

This is where I have some evidence that things like export bans actually have negative effects rather than positive effects, because what an export ban does is provide an enormous disincentive for the local farmers, because if you cannot export your products, then next year you are not going to plant enough land, so while there may be a short term relief for the poor, there is no long term relief to the food production situation. Therefore, for all intents and purposes, it probably is better to help the poor directly through some local purchase increase with food bonds rather than intervening in export and import bans. However, there is no blueprint situation that will solve everything.

I think some of the speakers said, and I agree very much, that there is a major difference in how countries have been able to cope with these price fluctuations, and this has all been to do with the fact whether they are major food importers or not. Countries that are major food importers and do not have a very good national production and have a fluctuating currency are in a very difficult situation; this applies unfortunately to a lot of African countries.

Looking back at the history, beyond the example of Brazil, there is the example of my own country, the Netherlands. What has really worked is something I want to advocate, because this is going to be the next big issue in 2012. That is the good old fashioned cooperative; farmers who organise themselves, farmers who extend throughout the food production chain. This has worked very well in other places as well. We need to look at how we can reinvent the cooperative as a way to balance price fluctuations for farmers and for consumers. A quarter of the population in Canada, in fact, is a member of a food cooperative. There are cooperative banks that have continued to do well during the banking crisis. 2012 is UN Cooperative Year, and maybe this is a challenge for all of us.

There are a couple of things that we have also said about GMOs, and let me say one thing. I think one of the most interesting applications of GMOs will actually be to solve the problem of biofuels. There is no doubt in my mind, or I think in anyone's mind, that using food as an input for fuel is ridiculous, but at the same time, all kinds of things that humans cannot eat, particularly lignine and other materials, are the most common organic materials we have on earth. There is interesting research that shows we can make these long fibres useful for very efficient conversion into energy that is done through genetically modified types of fungi and other lower types of bacteria, and I think there is tremendous potential to use cellulosic materials in one way or another. Therefore, the problem of directly converting

corn into fuel is one that will be phased out in the next few years. The fact that we are still using some subsidies to do this, particularly in the US, shows that we have a very distorted US farm market and farm lobby.

Finally, there is the WTO and the G20. I think the current situation in the WTO is a kind of deadlock. The question is whether we should try to continue the talks or find ways around it. I am starting to think that we should probably work on parallel courses. The fact that the G20 is now serious about food issues is a chance to put it back on the agenda. The problem I have with the G20 is that they have a lot of declarations and little means, but perhaps the G20 channel is faster than the Doha channel right now. However, there are a couple of other things that need to be solved, and these other things all lie in the area of how we can best make food production sustainable. The Israeli minister and others are right that a lot of damage has been done through agriculture as well, and the question is not just to increase production or even purchasing power, but to do it in such a way that we best use our resources.

I am a firm believer in the principle of the polluter pays. This ought to be central in fiscal reforms, to make sure we have a differentiating tariff that promotes sustainable production and taxes unsustainable or damaging products, including food.

Yashwant THORAT, CEO of the Rajiv Gandhi Trust

India is now legislating on the Food Security Bill, and the idea of the Food Security Bill is to live in dignity, free of hunger and free of food insecurity. The chairman had raised an issue as to whether we could globalise our concerns, and I was just wondering, whether here next year or at Rabat, if there can be a minimal agreement on food security for small landholders. Somebody made an excellent point, saying that the issue is not food availability, that the aggregate stocks of food globally could perhaps feed people who are not being fed today. Could we at least agree to consider a framework, neutral to nations, where the most vulnerable could be protected by the world community in terms of food security? That is one thought I had.

The other is whether we can agree at a global level to share the knowledge of research on a country neutral basis. Instead of each country having its own research and development, can there not be global pooling of knowledge which again is neutral to countries of the world? I also wonder whether we can have a global agreement on extension. We now know that food security and the Green Revolution are heavily premised on extension, and many of the countries, particularly in Asia, where public extensions have failed are now relying on the private sector to provide extension services. Can there be an agreement on that?

Regarding the small landowner, whose concerns are above all the most vulnerable, Louise has suggested that a good method of aggregation is the cooperative. I tend to agree, but only where cooperatives have come up as a result of a bottom-up movement. The governments of most of the colonial countries imposed cooperatives as a top-down initiative, and for that reason it remained part of a top-down state policy and not a people's movement. However, the fact remains that in countries like India, where the average landholding is 1.6 hectares, unless some methods of aggregation are found, unless some methods of making cultivation of land worthwhile are found, the question of migration from the rural sector to the urban sector can only assume greater importance, and therefore we must think of some way of aggregation without exploitation. These are the general points we would make.

Jean-Yves CARFANTAN, Senior Consultant, AgroBrasConsult

Those radical environmentalists you mentioned are not only concentrated in the French parliament debate rooms. We also have them concentrated in Brazil, and you cannot have any debate in Brazil about farm policy or environmental policy without dealing with very radical movements, most of them coming from Europe or the US, and it is something which is complicating the debate during the last 20 years, and made it more difficult to get a well-balanced debate between environmental issues and food production challenges. Our main challenge in the case of Brazil is still to provide a very low income population with the cheapest food that we can, and those concerns you have mentioned are not as strong in Brazil as they are in Europe.



The second point I would like to stress is about the ethanol sector. I do believe that we have two dynamics in the coming years. We will still have an ethanol sector, growing but with a lower rate of investments. This is not a contradiction with the fact that we have discovered oil in different places, mainly offshore. Why is this? Sugarcane production in Brazil provides three different materials: it provides sugar, it provides ethanol, and it provides electricity. The sugarcane industry in the state of Sao Paulo provides a third of the total electricity used in that state. We have surpluses of electricity because we produce biogases, which are burned and which create significant quantities of electricity for the local network.

A second element that makes me believe the ethanol sector will not disappear or become a secondary priority is the fact that oil companies are investing hugely in the sector. The most important uncertainty that we have nowadays is the question of the tax policy; in the last decades, ethanol became a very important fuel in the local market because there were tax policies that provided exemptions to make ethanol competitive with gasoline, but ethanol is mainly used in Brazil as a mixed product with gasoline. Therefore, I do not believe that the fact we are becoming an average oil producer will change.

Let me tell you something about oil production in Brazil. The main challenge we are faced with, and it has been discussed for the last five years, is how to avoid a sort of Dutch fever, and the interesting fact is a decision which was taken two years ago, probably one of the most important decisions taken by the Lula administration, which was to create a national fund to be used only for long term investments.

For example, the most important university in Brazil is the University of the State of Sao Paulo, USP as it is known, with an annual budget of about EUR5 billion. This budget will double because this university will receive a contribution from the national fund. This university and Petrobras will create what will probably be the most important university in Latin America within five years, and this is an example of investment in long term priorities such as education.

Another point I would like to mention is that, as we are going to become an oil producer, we will provide new raw materials used by the farm sector. All oil production fields in Brazil are also gas production fields, and while it is now a net importer of gas, most of the gas we use coming from Bolivia, within probably five or six years we will become a net exporter of gas. That is to say, we will produce more and more nitrogen fertilisers, which is a great contribution to reducing production costs, for instance, in the sugar cane industry, which is a huge consumer of ammonia, urea and such fertilisers. Therefore, those two elements are not as contradictory as it would seem at a first glance.

QU Xing, President of the China Institute of International Studies (CIIS)

Just to respond on the Chinese position on GMOs, there is a gap between the general public and the government. There is not a general awareness of the controversial nature of GMO products. Some intellectuals pay attention to this, but the majority of the public think that if the Americans think that GMOs are safe, they are safe. However, the government adopts a very prudent position, so if on the one hand GMOs are proved safe, it will be very helpful in solving China's food problems in the long term, but on the other hand, the government knows that to prove if a product is safe or not, we should have decades or even generations to determine whether a product is harmful to the human body. Therefore, the production of GMOs in China is still in an experimental stage, but GMO products, especially vegetable oil and beans, are imported from the US. The policy is to require enterprises to label a product, and it is up to the consumer to decide whether to buy the GMO product or not.

Mostafa TERRAB, Chairman & CEO of OCP Group

I feel like a panellist also, because there was a question on Morocco's Green Plan, and I have to be careful because it came from a prominent member of parliament. I invite you to have a broader discussion offline, but I cannot help but tell you that the Green Plan was very successful. I think it pointed the way to some of the solutions Mr. Thorat pointed



to, like aggregation, but we have to think very hard about his words of wisdom and ensure it is aggregation without exploitation. We have to be careful, because aggregations are not all created equal.

I think I will also give you a couple of minutes to tell you about something which has not been much discussed, the role of fertilisers in the success of the Green Plan, but let me also by way of caution, as you mentioned Brazil, say that the Green Plan has coincided with four years of heavy rain in Morocco, and many of my fellow Moroccans here have also lived through four consecutive years of drought. Let us make sure not to draw policy conclusions from what has happened over the past four years.

Member of the OCP group 1

This conversation has been extremely rich, and we have looked at a fairly holistic approach to this problem. I think the role of fertiliser needs to be mentioned specifically, because I look at it as one of the anchors in coming up with a solution to the food security issue. A lot of what I am going to say has been mentioned, but I think I will say something about an experience we had in Morocco that points to how we can work towards a solution based on very specific programmes.

Something that has been mentioned was this issue of innovation, and I think one of the things we have to look at is product innovation, and certainly that is a very important thing, but there is also business model innovation. For example, one of the things we have done in Morocco is to introduce a public-private partnership in order to turn the distributors into developers of the agriculture; essentially we force the distributors to include extension services as part of their service, and in order to become distributors they also have to develop and teach the farmers the right way to apply the fertiliser and what kind of fertiliser.

This goes back to the gentleman who was saying that it is not enough to have innovation, but you have to be able to transfer that innovation, and this was a good example of not relying on the government to do that but to rely on the private sector to push that transfer through some fairly structured and contractual extension services linked to the availability of fertiliser to those distributors. Therefore, that is very important in order to be able to transfer that knowledge to the farmers, because there is a lot of innovation that unfortunately never makes it to the farmers, and we see that in Morocco, for example.

The other thing that we need to realise is again something that was mentioned. A lot of the fertiliser that is used never actually makes it to the plant. The inefficiency of fertilisers is something of a problem, and a lot of it comes from the nature of the fertiliser, but also how and when it is applied. It is very important to make sure that the right fertiliser is applied, because not only are we going to end up with lower yields, but we will also end up with something that was also mentioned, the destruction of the soil system, and once you destroy that soil system, it takes many, many years to get it back. I think this is something that, unfortunately, we do not stress enough: when we do not use the right fertiliser, it is not just that we do not get enough yield, we actually run into the issue of destroying the soil system, and once you have done that it probably takes over 10,000 years to get that soil system back.

Therefore, some of the innovation that has to happen is not just under production innovation, but the business models also have to bring the private sector into the fold and make the private sector part of the solution. Otherwise, if it is just a top-down approach of introducing regulations or other means of government regulation, we might not get to the solutions we might want. I just wanted to give a couple of examples of a system that was introduced in Morocco; it is recent, and we will see the result of that in a few years, but I think we are very excited that this is where fertiliser companies, for example, can actually play a role in changing the nature of how some of this innovation and some of the transfer is done towards the farmer, especially the smallholder farmer.



Theodore MORAN, Marcus Wallenberg Professor of International Business and Finance Georgetown University

Since Morocco has been introduced into the equation, let me ask a question about phosphates, fertilisers and food security. The most recent statistics show that the concentration of phosphates in the world has shifted dramatically in the direction of Morocco. My colleague from Washington and I are a little suspicious of these statistics, because there has been a lot of explanations in Morocco and other parts of the world that had not been explored. Therefore, I hate to disappoint you, but I think you will not remain so central to the fate of the universe.

However, this is a serious question. You have a very large expenditure programme in increasing rock production, you have a very ambitious slurry system, and you have a new chemical hub. How are you going to use these expenditures to help contribute to avoiding the problems of food security, avoiding the problems, as Louise pointed out, of fluctuations? Could you amplify a little what OCP's strategy is in relation to international food security?

Mostafa TERRAB, Chairman & CEO of OCP Group

How will we contribute to food security? Looking at the numbers that Louise mentioned earlier on, I saw an analysis that said, given the limited amount of arable land available and a growing population, and notwithstanding the idea of using arid zone agriculture, I think, in terms of numbers, we need 70% more production from the same piece of land. This is going to come from technology and fertiliser, GMOs, fertiliser and so on, and increased productivity can only come from that. Fertilisers have played a role and they will continue to play a role. I think the nervousness around phosphates comes from the fact that, of the three nutrients, nitrogen, potash and phosphate, this is the only non-renewable one. You can synthesize nitrogen and produce potash, but at this stage there is no known way to produce phosphate, so it is a finite resource, and we have issues around peak phosphate and very understandable worries about the amount of reserves.

Keep in mind that some of this is panic-driven; I have even seen figures that Morocco holds 85-90% of world reserves, and that is probably wrong, but Morocco probably has a significant amount of the world reserves of phosphate. You are also right to mention that speaking about reserves per se has no meaning, that one has to look at the costs and thereby the price of phosphate, and the price of phosphate having increased means that there are more candidates for reserves. There are reserves in Israel, we do not know how much, but it is useless to speak about reserves without speaking about prices. Basically, the parallel of food with agricultural prices can be made. The increased price of phosphate is an opportunity, because it has allowed companies like OCP to invest in more production of phosphate, and the phosphate we produce and the fertiliser we produce out of this phosphate can only go out of Morocco, because the Moroccan market is fairly limited. That is our contribution.

Such a heavy investment will contribute to stability in phosphate and fertiliser markets, and that is exported, that goes to help feed the planet.

Theodore MORAN, Marcus Wallenberg Professor of International Business and Finance Georgetown University

I want to follow up. An important connection to me is on the question of price volatility, because as I understand your 5-6 year investment programme, you are taking a lot of the risk on yourself. People will say that the prices of phosphates will fluctuate and might or might not invest, but you are going ahead with a very big programme despite this. Therefore, it would seem to me from a risk mitigation point of view that there is a case to be made here that if it does not turn out to be profitable you will be left with excess capacity, and they might say your decision was not such a smart one.



However, from the point of view of public goods and collective action in the world that my colleague was pointing out, you are actually doing a public service, it seems to me. Am I right there?

Mostafa TERRAB, Chairman & CEO of OCP Group

You are not. Do you want to address this particular question?

Louise FRESCO, Professor at the University of Amsterdam

I will make a few comments. Phosphate is a very interesting case in point when it comes to how we will deal with scarce resources in the future. The fact that we have higher prices will lead not only to investment but also to new technology in terms of better retrieval of phosphate. This might not be in the short term interest of OCP, but in terms of the world and therefore also in terms of global public resources, and hence also for OCP in the longer term, the fact that we will do better work with the same amount of phosphate by being able to retrieve some of that from our waste is going to be an enormous benefit for all of us.

There is a very similar case to be made for the use of fossil fuels. I think the whole technology will go into more efficiency, more output per unit of input. Having said that, the continent that most lacks phosphate is Africa, and Morocco is very well placed to talk with the African leaders to make sure that we have a long term plan to get the phosphate inputs in African agriculture up to standard. I remember that when I was still a student, we once jokingly calculated that if you just threw rock phosphate out of a plane over Africa, you would already do a lot to raise African production, even at the very low levels of retrieval you have with rock phosphate.

There is a major challenge, and we have discussed this, to make sure that we get responsible phosphate input into African agriculture. That means availability, but it also means an economic plan, and again it means that high food prices are an incentive for phosphate use also in African agriculture. Interestingly, coming back to your point about whether Morocco is going to be the new Brazil, you probably know that geologically, the north east of Brazil and Morocco have something in common, because hundreds of millions of years ago they were joined, so there are lessons to be learned from the development of Brazil and of Morocco, if only for the fact that both have soils that actually need a lot of care. I am very much in agreement that we need to remember that soil is also in the short term a non-replenishable resource, so caring for soil also means we feed the soil in such a way that we have the best possible output.

What Morocco also really needs to do, as Brazil has done, is to make sure enough young people not just remain farmers but also go into agricultural science. It is a tragedy that we do not speak about that fewer and fewer bright young people do not go into agricultural science. Thirty years ago that was still a career that people in many countries wanted; now parents want their kids to be medical doctors or whatever, and we are not recruiting the best scientists. It would be fantastic if Morocco could actually launch a programme with the help of OCP, and I know you are already working on the university, to get young people into the innovations that are needed, not only to feed Morocco, but to have the same kind of effect that Brazil, China or India now has on the rest of the world in terms of technology and innovation. That nascent Moroccan model could be of great use for the African continent.

Cullen HENDRIX, Research Associate at the Peterson Institute for International Economics

I do not want to rain on the high price parade, because the producer incentives are clearly there, and if you can get prices a little higher and volatility a little lower, we will see investment. However, it probably needs to be mentioned in 2007-2008 there was rioting in 48 different countries. The prime minister of Haiti lost office in the aftermath of food riots, and you could argue that the toppling of the government in Madagascar was related to that as well. Food prices



were implicated in the instability in the Middle East and North Africa; the Arab Spring, at least according to some, is in part a response to higher food prices.

The question is this. How do you adjudicate the producer incentives with the fact that you have urban populations that have grown relatively accustomed to low price, plentiful food, the cost of adjustments are being borne at the household level, and this is pushing people out into the streets?

Mostafa TERRAB, Chairman & CEO of OCP Group

I just wanted to mention that this is a global governance conference, and Ms. Fresco just reminded us that Brazil and Morocco were geologically tied together, so I suppose we could have a claim in the oil and gas reserves.

Philippe CHALMIN, Professor at the University of Paris-Dauphine

I think we are reaching a point where I would like say that agricultural policy can be paid for either by the consumer or the taxpayer. Recalling 1933 and the New Deal, prices had to be kept low through direct subsidies from the taxpayer. Europe saw 30 glorious years of growth from 1958, food prices were set high in order to incentivise the farmers to produce, and that was paid for by the consumer. I have not found a solution, but there are a lot of intelligent people here who probably will, about what you do in a developing country where the consumer needs to have low prices and there are no taxpayers. How do you finance an agricultural policy, if we all agree that the farmer needs stable and remunerative prices? Without being too European, the perfect model for a developing country is the Common Agricultural Policy as designed in 1958. That was probably a perfect policy if you wanted to raise production. The problem is that it was financed by consumers; we cannot put that in developing countries. Regarding the other reference to 1933, it is complicated. Do you have any solutions?

Meir SHEETRIT, Member of the Israeli Knesset for the Kadima Party

There are all kinds of techniques. I remember how they did it in Israel in the 1960s and 1970s, when there was the same problem with the small farmer producing chickens, milk etc. The government, in order to solve this problem and to ensure a certain price for produce to make it work, established different councils for different agricultural products, and the farmer could not simply sell his product to the market; he had to supply it to a certain big cooperative company, controlled by all the farmers in Israel, and they sold it to the final customer. The government in that way could control the prices, and even guarantee a price for certain products.

For example, because we had a problem with small farmers producing chickens, eggs etc., and during that time the land in the centre of Israel became very expensive, making it no longer worthwhile to use it for agriculture, they had to transfer the quota of eggs that had to be produced to other farmers in Galilee, in the rural areas. The government bought their quotas of eggs and chickens and gave it to the rural farmers, and they are now producing that and guaranteeing a certain price for eggs, chickens etc. That helped to give some economic certainty to the farmer. I do not know whether it is possible to do this in a large place like France, but in many places it could be done. The government could be involved in creating a kind of system which provides certain kinds of guarantees to the farmer.

Another thing is that sometimes there are natural disasters, such as cold weather, so the government developed a kind of insurance for agriculture, and every time there is some kind of disaster, farmers are insured, and the government pays compensation in the case of disaster. I remember that one of the ministers of finance, who was afterwards prime minister, said that he did not understand why compensation for heavy rain and for drought was being paid out in the same year. Therefore, there are systems to ensure that the small farmer is able to stay alive.

**Philippe CHALMIN, Professor at the University of Paris-Dauphine**

The Canadian parliament voted on the 28 November to abolish the monopoly of the Canadian Wheat Board. That means that the wind of liberalisation is still blowing.

Mostafa TERRAB, Chairman & CEO of OCP Group

You went back into history, but I think there is a third component. You asked whether this should be paid by the consumer or the taxpayer, but let us keep in mind that in the Western world it was paid by neither, but through debt instead. That is also a solution.

Member of the OCP group 2

We spoke about fertiliser, GMOs, and means of increasing productivity. I think we forgot one key element, the most basic element, which is water. My question will be a little bit extreme. Could we see, in the foreseeable future, a competition between the water which is used to irrigate land and grow food and the water which is being consumed? Is it foreseeable that water will become so scarce that there will be competition between drinking and eating?

Daniel NAHON, Geosciences Professor at the University Paul Cézanne in Aix-en-Provence

We use about 83% of water for agriculture, and just a little to drink.

Louise FRESCO, Professor at the University of Amsterdam

There are some loose ends, so let me take those up in order to get at the overall picture. We raised the issue of water. I think the main issue about water is that it is not globally scarce; water does not exhaust itself, it is in the hydrological system, and it is a local problem, never a global one. Having said that, you need to deal with it locally or at least regionally, because there are many problems where countries share a common watershed. The key issue in agriculture is that you have the water, the fertiliser and the plant all there at the same time, and that is the fine tuning we need and do not have.

Regarding irrigation, it is perhaps important to realise that in China 23% of the agricultural area is irrigated, a little bit more in India, but only 4% in sub-Saharan Africa, yet irrigated land produces about three times more than non-irrigated land. Therefore, there is enormous potential in Africa; if you look at Lake Victoria or Lake Malawi, there are huge bodies of water we are not using, and enormous investment is required, but irrigating without having the right type of fertiliser at the right time will lead to all kinds of salination problems that have destroyed entire civilisations. Think of the Sumerians, Mesopotamia and so on. This is where education, extension and fine tuning are important.

Regarding waste, it is indeed true that 30-40% of food actually does not reach the consumer, and that is for two reasons. Firstly, in poor countries it is eaten by rats and insects, and it deteriorates; this is indeed where GMOs can help, with technologies to extend the shelf life of fruit and vegetables for much longer, and ensuring the outside skin of vegetables is not damaged, so there is a lot of potential there. However, the other half of the waste comes from developed countries, because we are so scared of eating something that is one day past its preferred date that supermarkets and households throw away enormous amounts of food. The average British household throws away 300 kilos of food a year, and that is totally unnecessary, so that is something that has to do with our rules and regulations.



The main issue in richer countries and for the urban upper and middle classes in poor countries is that food is actually too cheap, and I will give you one statistic that I find staggering. The average household in Europe in the 1950s would spend half of its income on food, whereas today it is 10%, and this also applies to the urban educated classes in many so-called poor countries. Therefore, waste remains a real issue.

The other thing we have not mentioned that I feel quite strongly about is pest control: as you get more intensive agriculture, you get more disease and pest pressure, and in fact adding nitrogen or phosphate to a plant actually means that plant is more palatable and attractive to insects. The control of the whole ecosystem, including all these nasty beasts, goes together with increased intensification of agriculture; in fact it is all about increased fine tuning and education of farmers, and we lack the tools, the motivation and the political will to create a class of entrepreneurial, top-rate farmers.

Where we need global governance is in GMOs. I am not worried about the GMOs themselves; I think there is reasonably good evidence that the risks of GMOs as we know them now, and as we know now about genome construction, does not present any additional risk either to human health or to the environment. However, that is not a proof of the contrary, and what I would like to see is an international body that deals with some of the evidence as it comes out of different countries, that sets up international standards for reporting on GMO-related problems, so it gets out of the way some of the fears there are in some countries, but also some of the wild testing going on in other countries. I think there is still a long way that we need to go.

Finally, there is one positive statistic I want to share with you. We keep on saying that land is scarce; however, the latest reviews of land availability actually do show that we still have some margins. We still have about 500 million hectares, whether in arid or particularly in semi-arid areas, that are not being used and have good agricultural production potential. The question is how we best use them. A major part of that is in Africa, and some of that in Latin America and also in Central Asia. We have a little bit more land than we thought, but that does not take away from the burden to produce sustainably and equitably as far as possible.

Mostafa TERRAB, Chairman & CEO of OCP Group

I cannot help but point this out. Why could the international body you mentioned not be the FAO?

Louise FRESCO, Professor at the University of OCP Group

Give me an hour and I will talk about the FAO, but I cannot do it now.

Jean-Yves CARFANTAN, Senior Consultant, AgroBrasConsult

Just to mention a last point and to give an optimistic signal, part of the population in Brazil has African origins, but the fact is that Brazil has only recently discovered Africa. This means that nowadays Africa is seen not only by the government but by private companies as a new frontier, and this has some positive consequences. For instance, many private foundations have been created in the last ten years to create training programmes and support initiatives with research centres in Africa. The purpose is to try to transfer the core experience of Brazil during the last 40 years. We have developed a central area which is called the Cerrado, a savannah region, and in many aspects the Cerrado has common points with different African countries, so we tried to transfer the best of what we have achieved in the Cerrado to help create conditions in some African countries for agricultural production.

Just to give some examples, there is a very interesting programme in Angola and in Mozambique, where the Brazilian company Vale is producing iron ore. It also supports different farm programmes, and the same company and other



Brazilian companies are supporting farm initiatives in Mozambique, Malawi and Zambia, and one of the most important points for the coming years is that there will be deeper cooperation between Brazilian private initiatives, Brazilian government organisations such as Embrapa, which is the national agronomy institution, and African institutions. Brazil has discovered Africa, and this is probably something very positive in the scenario we are talking about here.