



## TRANSCRIPT SPEECH VANDANA SHIVA

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I want to thank the organisers because I had started to give up hope on the Netherlands. The 80s used to be so vibrant. My first ever soil conference that I attended was in Amsterdam. It was inspiring and exciting. José Lutzenberg, who became the environmental minister of Brazil, was there and the earlier organisation out of which Etcetera was born. It used to be called RAFI, the Rural Advancement Fund International. And then the ecological movement went into hibernation, a little bit, at least for us who live far away. So I want to thank all of you. I want to thank the organisers. It's wonderful to see the number of people and organisations which have come together for this.

So why do we need another food system and another agriculture system? Because this one was never meant to be. Every tool of the current system was designed for war. It should have never entered our food system. Pesticides were designed for the concentration camps, the early generation, and then they were designed for biological and chemical warfare. It is only when the industry that should have wrapped up after the war, decided oh, let's just make nice ads: 'DDT is good for me'. If you look at the ads of the period when the war was ending, they show how an industry that had gotten used to war profits, was now transforming itself into an agro-chemical industry. The synthetic fertilisers were made in the explosive factories. And that's why the next time you read about a terrorist attack, whether in Afghanistan, India, or Oklahoma, there will be a little line that says 'fertiliser bomb'. Remember the Oslo boy who was buying fertiliser and then blew it all up at the offices and then shot people on the island? These are weapons of war and they are also toxic and poisonous. So the first reason why we need another food system is: we need a food system without poisons.

This morning Pablo showed the ads on DDT and how the same scientist who promoted DDT then had to admit the harms. Except now they are unleashing 6,000 untested chemicals every year. And at that time they did not control governments, they did not control research in the universities, they did not control the media. So we can't afford the continuation of these toxics.

Another reason why we need another food system is because an agricultural system that was designed for inputs that came from war can only function as a monoculture. If all I am thinking about is the nitrogen, phosphorous and potassium, what's called the NPK mentality, then I can only grow crops that can deal with those fixed doses. Whereas if am growing corn and a bean (as was shown in the earlier slides), then the bean fixes nitrogen for me and the two can grow together. As soon as you

apply synthetic fertilisers, plants start to compete. We have this wonderful mixture of the pigeon pea, the Toor Dal which grows quite tall, and Ragi, which is a millet. These two have been growing as companions for millennia. The Ragi gives you the calcium, the iron and the fibre and the Toor Dal gives the soil the nitrogen but it gives you the protein.

When I was doing seed collections I went to every campus that I could visit. The campus of Karnataka Agriculture University was having such a difficult time getting a companionship between these two crops. They showed me about 60 plots where either one or the other became dominant. And I asked them, "Are you fertilising organically or synthetically?" They responded, "No, no. We use synthetic nitrogen". Of course one crop would do well and the other would not do well. They could not get it right, because they weren't allowing the cooperation in the soil and the cooperation between the plants and the intelligence in each of these living systems to play its role.

Every living system is a self-organised system, that's what makes living systems living. And when anything is self-organised, it is based on cooperation. Any system that is externally organised must become competitive and that applies to external inputs in agriculture and external inputs in systems in society.

When we stop defining ourselves as who we are, what we want, what we love to do, and what gives us joy...

University degrees are churning out students with a BT (Biotechnology) degree, and IT and MBA degrees. Biology has been shrunk to biotechnology, knowledge has been shrunk to information technology and organising has been shrunk to business management. I don't think the world needs only those three skills. It needs much more. It definitely needs skills on how to take care of this planet. A skill that is not provided by industrial agriculture. All that industrial agriculture has done is destroy nature's gifts of soil, biodiversity, water, even the air, and the climate.

I grew up in India, where the water in the desert was at 10 feet. The Green Revolution requires not just the external inputs, but monoculture is also very water intensive. In Punjab 90% of the water is used for irrigation, globally it's 75%. And what comes out is polluted water full of nitrates that create dead zones in rivers, water bodies and oceans. Those monocultures based on toxics are destroying biodiversity both by displacing crops and the varieties and species. We used to eat about 8,500 species of plants, as human beings. In India before the green revolution there were 200,000 varieties of rice, 1500 varieties of mangoes, beans. I remember how I did a collection of wheat and took 1500 varieties of wheat to what became the Cambridge seed bank, which was then privatised to Unilever and then to Monsanto. That's where they picked up the gluten free wheat and then patented it and we had to fight that patent case, because it came from the Indian collection.

In 1995, the FAO organised a plant genetic resources conference in Leipzig. An assessment then was that 75% biodiversity had disappeared in agriculture, because of chemical monocultures and the introduction of varieties designed just for chemical response. My guess is it is now about 90%, because at that time Argentina had not been destroyed, the Brazilian Amazon had not been chopped down large scale for soy cultivation, and the Midwest of the US wasn't a monoculture of GM soy and GM corn. So my guess is about 90% of crop biodiversity is gone.

Those chemical sprays destroy more. The 75% disappearance of bees and the colony collapse disorder. But not just of the bees. We did a study of the BT cotton planting areas and in four years of planting, 22% of beneficial soil organisms had been killed by the release of the toxins. There's new work that shows that the spraying of Round Up for crops was killing milkweed which was supporting the monarch butterfly. And there were Cornell studies that show that pollen of BT corn kills monarch butterfly larvae. So it is not a surprise that 75% of the monarch butterflies are gone. Their migration to Mexico and the area where they used to come which used to be one field of colour, but it has shrunk dramatically. With animals it's the same.

Trees don't exist in industrial agriculture. In Punjab you don't see trees, because with chemicals and large-scale monocultures comes mechanisation. And every perennial and hedgerow which we need as field banks is seen as interference for the tractor.

Any large-scale mechanised industrial system is a desert in every meaningful way. Living soils have millions and billions of soil organisms that are creating our soil fertility. Darwin's real book is the one he wrote on earthworms. He says by the time that the history of evolution is written, we will realise that no other species has done so much for this planet as the earthworm. It creates soil fertility and turns our soils into dams where water can be stored. It's doing the work of a tractor, a dam and a fertiliser factory all at the same time. All we are doing is dumping urea and killing it. Do a little experiment and sprinkle urea salt on an earthworm, it would die of course, I've done it, but I never let it die completely. When we were young and we trekked in the mountains, we would get bitten by leeches; we always carried salt, because that was the only way you could get the leech off you. Well, all of these synthetic fertilisers are salts.

We do these tests in our lab where chemical soils and organic soils are compared. Our farmers bring these soils and then they come back 2-3 years in a row to see how the health of the soil is improving. My assessment is that 75% of the soils of the world have been deprived of their organic matter, their living humus, their soil organisms. They have been compacted and, because they are not being able to aggregate. It has led to soil erosion, which is why we have a treaty on land degradation and desertification, because it is a serious problem.

I did a book called *Soil, not Oil*, because in the lead up to the Copenhagen summit, agriculture was not even on the horizon of in a serious way in the climate discussions. I did all the calculations on the basis of the IPCC assessments. If you add all the figures, the overall contribution of industrial agriculture and globalised trade in industrial agriculture is contributing to 40% of greenhouse gasses. That includes CO<sub>2</sub> emissions from mechanisations and food miles, but it also includes nitrogen oxides from synthetic fertilisers. Nitrogen oxide is 300 times more destabilising for the climate. And there is the methane from all the factory farms. So, industrial agriculture is causing 75% of the ecological devastation on the planet.

In spite of destroying 75% of the living systems and the eco systems, the myth is spread that without industrial agriculture the world can't be fed. The figures are now being repeated daily: that 70% of the food in the world is being produced today, in 2014, not a century ago, not fifty years ago, but today, 2014, on small farms. The reason the UN had to declare this year as the year of the family farm is because of this figure. The main stay for food security is small farms and gardens, urban gardens. 30% comes from industrial agriculture and yet this 30% is destroying 75% of the planet. To just extrapolate: if that system was allowed to spread, to destroy the remaining 25%, will we get

more food, or zero food? A destroyed planet will give no food at all. Dead soils, disappearing waters, a totally chaotic climate, no seeds – it is a recipe for an absolute, not just disaster, but a recipe for human extinction.

And how long has it been? The Green Revolution was brought to India in 1965. We're talking about 50 years. In 50 years, 75% of the planet has been destroyed. It will take them just 10 years to wipe out the rest and a lot of other species will go, but the human species would surely get wrapped up. So the reason we need another system, is because I think we should try and survive into the future as a species. No species has deliberately designed its extinction, but through industrial agriculture we are. It is in the design of the agricultural system. It is in the design, because it is destroying the basis of farming: ecological systems. It is in the design, because it is actually not a very productive and efficient use of natural resources.

Let's run through a few figures. Suppose we are more productive, but it uses 10 units of energy to produce 1 unit of food, whereas ecological systems use 1 unit of energy to produce 2 units of food. Or take a fact... how did I get into this? I got into this because in 1984, we had had two mega disasters in India: One was the disaster of Bhopal where a pesticide plant – owned then by Union Carbide, now by Dow chemical – leaked. It leaked in the middle of the night on December 2nd. A cold night with a very low inversion layer, so the gas just moved through colonies and settlements, killing people. 3000 were killed immediately, 30,000 have been killed since then and hundreds of thousands are being born crippled. I was in Bhopal last year and it was a hall full of the children who have been born crippled. So the disaster isn't over. It's also not over because just last week Dow, which should be compensating for the damages, has sued the survivors for continuing their struggle. In that same year, we had the rise of extremism in Punjab, which is the land of the Green Revolution. The Green Revolution had been given a Nobel Peace Prize, but in Punjab 30,000 people had been killed.

I was busy with quantum theory for my doctoral work, so I had no idea what was going on with the Green Revolution. But I decided in '84 to study it and I was doing a major consultancy for the UN university on peace and global transformation and natural resource conflicts. So I just said I think there's something here. Because there were conflicts over rivers. Farmers were protesting but the government sent the military. The military was sent to the most sacred shrine of the Sikhs, the Golden Temple. As a result of which Indira Gandhi, Prime Minister at that time, was assassinated by her security, who were Sikhs, and the next day 3000 Sikhs were killed in a program designed for violence.

The issue has not died, this issue of injustice to the Sikhs hasn't died, so I decided to go to Punjab to read every little text, every book on plant breeding, every book on irrigation, every book on pest controls, and every book on soils. Within ten years, I found out that half the soils of Punjab were diseased and dying. Ten per cent were dead, salinated, water logged deserts. I wrote a book called *The Violence of the Green Revolution* and decided then to commit my life to non-violent agriculture.

But then I realised, in the process, that actually we have been told that the Green revolution took India from a famine condition to a surplus. But we didn't have a famine in 1965! I was old enough to know, I was in school. We had a rise in price, because we had a drought and the US would not send us wheat. They said we had to change our agriculture and introduce the chemicals. I won't go into the details of what went on that time, those of you who want to know can read *The Violence of the*

*Green Revolution*. But I would look at the fields of Punjab and I know farming from my region and other parts of the country. I could see with my eyes that these are impoverished fields.

Then I started to do scientific studies. Every time you look at a monoculture, no matter how intensive, it will always produce less than a mixed cultivation on a biodiverse farm, in what I call a biodiversity and ecological intensification. And the figures are very, very dramatic. We've always been told that 'food' increased, but what is never talked about is that the production of other crops went down. Millets are as good as zero, pulses have disappeared, all seeds are gone, basic foods that are vital to a balanced nutrition aren't produced anymore. So we have those mountains and the 21 million tons that are rotting, because food has stopped being food.

I became a volunteer with Chipko, a movement where women came out to protect the Himalayan forest, and the women would say, "You would have to kill us before you kill the tree" and they would hug the tree. I would take them to Chandigarh for some reason and they would see these giant storehouses and they would ask me, "What is that?" and my reply was, "Wheat", and they would ask "Why are they insulting food like this?" This is because food can only be cared for on a small scale. Food can only be cared for in decentralised systems.

The centralisation of production and with that the centralisation of distribution by its very necessity means waste. There is no waste in living systems. There is no waste in ecological farming systems. There is no waste in local food systems. I grew many crops, all of them are used: some for the soil, some for the cow. I say, in India nothing gets wasted; the cows are always waiting.

Or the earthworms are waiting. It only becomes waste when either it is sent long distance and stored in centralised food systems as in Punjab or taken by Walmart and first Walmart says, "Throw away half, because the apples are not exactly the right size". A South-African farmer told me that overnight they had to change the trees of the variety of the apple, because Walmart changed the size of the truck. And of course you know the famous tomato that never made it to the market, the 'flavour saver' was designed for transport, not for eating, as so much food is now. Breeding today is for trucks, not human beings – how long can it sit on a truck? And then it has to be the identical size. That's why they didn't like the round tomatoes. Berkley had a whole research project about square tomatoes, again for packaging and transport!

I read in an Indian newspaper that Wageningen is working on soils and the food problem. They are actually planning to grow food on Mars. They have got a research project going on in this university. Our research systems are doing brilliant at doing what doesn't need to be done and not doing what needs to be done! Because the movement of Navdanya that was started to conserve biodiversity and seeds, we intensify biodiversity. We ask farmers to grow as much variety as they can on the farm and then eat as much as they can on the farm. So when people tell me organic is too costly, I say, "Not for the farmer who grew it". And they have the first right to organic foods. Having done the biodiversity conservation and non-biodiversity intensification, we decided not to measure the monoculture output, which is a yield per acre, which is repeatedly talked about. This yield is for a single commodity and what leaves the farm. So the grain of wheat is measured as a yield but not the straw that should stay on the farm. Corn is measured as a yield, but not the straw of corn. So what should be recycled on the farm is treated as waste and is not allowed to return to the soil. In Punjab this package has meant that the monoculture has been harvested by combine harvesters and, as you

know, combine harvesters leave a huge stock which they then have to burn. If any of you try to come to Delhi in winter and you cannot land because of the smog, that's part of the contribution.

So when we did the biodiversity and productivity analyses, hands down, a biodiverse farm produces more. Pablo also showed a figure with the maize and the pigeon pea combination. What we found was that the more the biodiversity, the more the productivity and, for the farmer, the more the profits. First of all, because the farmer is not in distress, and second of all, because the farmer has resilience. We had droughts in 2009 and flooding like you wouldn't believe last year. We lost 20,000 people in our region because of the climate disaster last year, something that never made it to the international news.

If you have a diverse crop, one thing or the other will thrive and it doesn't get wiped out. One crop with one external input and a perfect requirement of water is less resilient: too little rain or too much rain and you get zero output.

Then we said that what matters is not the kilograms of what you are eating, but what's in it, the nutrition. And our food has been systematically de-nutriented because of the application of just nitrogen, phosphorus, and potassium. No other micronutrients and trace elements are going into the soil. Our plants are deprived, our food is deprived and therefore we are deprived. US and UK data in the last sixty years show the decline in calcium content is 29% in US, 19% in Britain. Magnesium 21% and 35%, potassium 6% and 14%. Phosphorus 11% and 6%, iron 32% and 22%. Zinc they were not even looking at, at that time. I meet more and more doctors who tell me zinc deficiency has become the single biggest problem for mental problems. I met a doctor who said 50% of the young people in Australia are depressed. When they do the brain chemistry they are finding zinc deficiency. We didn't even imagine but soils need zinc, plants need zinc and we need zinc.

So we started to measure health per acre, which is nutrition per acre. I won't run through the figures of different farms because it would take me all night. But the system has been designed to wipe out nutrition, first by wiping out biodiversity, then by depleting the soil of their nutrients, the plants of their nutrients and our food of its nutrients. And the focus is yield of single commodities. So of course there have to be deficiencies when there are no greens in the field, because fields are now sprayed by Round-Up which kills everything green it comes in contact with. Children will have vitamin A deficiencies. The solution is to grow the greens again! 20,000 units compared to the 350 in the Golden Rice.

I know there's a fellow who pretends to have been working at Greenpeace in Canada. I got a letter from Greenpeace Canada that he was kicked out because he was a lobbyist for the nuclear energy industry, for the GMO industry, and for the tar sands – everything negative, he always was standing in defence of it. He was pretending he's an ecologist who has to come and wake up the Europeans, because you are involved in a crime against humanity by not wanting GMOs. It was the golden rice tour. I had done an essay long ago about it; it was 2000 when they first started talking about it, because we know the different foods that can provide a hundred times more vitamin A. And not just vitamin A, the zinc, the magnesium, the iron, and everything else we need.

Just last year, it was all about the poor child who is going blind and that woman in India who is dying because of iron deficiency. Now they come up with a GMO banana and then you wonder if a banana has iron? It's got very good potassium, it's very good for when you have renal disease, but it's not the

best source for iron: it only has 0.44 mg. The turmeric we use in our Indian food has 67 mg. The neem has 25 mg, buckwheat has 15 mg, the beautiful tree Moringa which is rich in vitamin A and rich in iron has 28.26 mg. Rice bran has 35 mg. There is no dearth of iron if we allow diversity to flourish on our farms and in our kitchens.

The monoculture of the mind, as I have called it, can only think in terms of the 4 or 5 commodities on which they can make profits. The reason we are seeing such an expansion of GMO corn and GMO soya is because with it are connected royalties. It's not that farmers in Argentina said 'give us GM soya'. In fact the farmers of Brazil have sued Monsanto, 2.2 billion dollars for unjustified royalty collection. Monsanto was collecting royalties on farm-saved seed.

So another reason why we need another food system is because we can't afford this blindness to the gift of abundance that nature gives us, the gift of biodiversity. It has already cost us too much. We now need to work with biodiversity to produce more food and nutrition while using up less of the earth's resources. A smaller footprint and a higher output. The current system has a huge footprint with a negative output.

There is another big reason why we need to move to another food system and that has to do with science and knowledge. For me as a scientist to look at an agricultural system, the first thing I want to study is how the soil and the plants and the animals and the human community relate to each other. What are the connections? That knowledge of connectedness is ecology, a science of relationship, and that's why agroecology – without anyone being paid to say agroecology, everyone is talking agroecology – it is a movement that has grown without a lobbyist.

Two areas of how the industrial system deals with soil fertility, is that it has no idea what's in the soil and it has no idea what the soil organisms do. All that it knows is that I could make synthetic fertilisers and synthetic nitrogen in explosive factories, let me now use them somehow or another, without knowing what it does to the living system which gives you the real fertility. I call it a science of ignorance. Industrial fertilisation is a science of ignorance. In relationship to the living soil, it has zero knowledge. Its science is a chemical knowledge about how to create a chemical, initially for the war and now for the farms.

Similarly, if I want to understand how pests are controlled, I would do what Albert Howard did. Albert Howard was sent to India as the imperial economic botanist in 1905 by the British Empire. He arrives and sees there were no pests in the fields. "I threw away my spray guns and turned the pests and the peasants into my professors. And having studied from them, I then understood that the emergence of a pest is already a sign of a failed agricultural system. Because a healthy system should have no pests. It'll have insects, but because of the balance, no one insect will become a pest, just as no one organism will become a disease." But what is pest control in the industrial system? You made some chemicals for the war, said now let's find a way to spray them on bugs, but you don't know what it does to other species, you've got no idea what it's doing to human beings. Again it is ignorance of the relationships between pests and predators. The science is a chemistry of producing poisons, it's not the science of the ecology of pest control. So they have got very violent tools from another science, applied to the wrong domain, with ignorance about how the food system works.

The biotech industry gets mad when I say that the reason genetic engineering is not such a good idea is because it is just a stupid way to do things. It is a stupid way to get iron in your food, to do it

through GMO bananas, it is a stupid way to get vitamin A through golden rice, it is stupid to control food pests by putting toxic genes in the plants through BT toxins – it is even more stupid to try and control weeds through herbicide resistance. Already just in 15 years half the farms in the US have been taken over by super weeds, half, 17 million. So what are they doing now? They are breeding, no engineering, genes into corn with resistance to an ingredient of Agent Orange, 2,4-D. And Dow is the big player again! The lobbyists have worked with the European Commission to push through the Pioneer 1507, just recently. Pioneer 1507 has been jointly developed by DuPont and Dow. Dow, if you remember, is the same company responsible for the continuing injustice in Bhopal.

The movement in Hawaii is so strong in terms of trying to become GMO free even though Monsanto has all its seed production on the island of Hawaii. We managed to get to some laws passed, labelling laws, laws to be informed of what is in the sprays that are put on the seeds. Dow is suing the local government that passed the bill for the right to know. “We’re gonna kill you and you won’t know how we killed you.” So the genocidal aspects of the system are a very strong reason – ecocides and genocides jointly. We have witnessed the genocide through pushing farmers into debt. I was very privileged to have been invited to a meeting in 1987 when the industry laid out very clearly that, first, the reason why they were doing genetic engineering was to take patents. They were not interested in genetic engineering, they were interested in the patents. That they could, by saying, “I’ve added a new gene”, call it a novel crop, and then claim they were the creators and makers and owners and should therefore they collect royalties.

Monsanto is on record for saying that they wrote the intellectual property rights agreement of the free trade treaty, GATT, which became WTO article 27.3b. Monsanto said they were the patient, the diagnostician and physician all in one. “We defined the problem.” The problem they defined was ‘farmers save seeds’ and the solution they offered was that it should now be a crime. When I heard these industries talk about five companies controlling our food and health system through patents, that was the day I decided that I would save seeds and not recognise patents. Because life is not created by Monsanto. Life is created by life. And the evolution of biodiversity is a gift we have received from nature and our ancestors. It was not invented the day a toxic gene was put into it, in fact, that should be counted as pollution in terms of the biological integrity of that particular species. I took a pledge: no matter how long it takes me, I will not accept GMOs and I will not accept patents on seed. GMOs in fact translate into “God, Move Over, we are the creators now onwards”.

One side is the control, the other side is the harm. In terms of biotechnology a lot of discussion has been around safety. We are repeatedly told every research says it’s safe. Some neutral research, independent research found harm. Árpád Pusztai was the first commissioned by the UK government to study GMO potatoes in ’98. He didn’t expect to find what he did. Reduced brains, expanded pancreas, compromised immunity system, total damage to the endocrine system. So the director held a press conference. They said, “If this happens in three months of feeding, what’s going to happen to human beings eating this all their lives?” For two hours, BBC covered this issue and then came silence. Blair made sure Árpád’s lab was shut. Árpád had moved to England after the war in his search to find freedom. He’s gone back to Hungary to find freedom.

More recently, Seralini – one of the top scientists in France – decided to do a two-year study, because he was a regulator. He found the studies that the industry was doing were very, very sloppy. He thought, “I should find out what is happening”. He did this very famous study in the Food and

Chemical Toxicology Journal. It was screened, there was attempt to have it withdrawn. The journal claimed it was peer-reviewed and they can't withdraw it. It's gone through every scientific assessment, so Monsanto just changes an editor, Goodman. So he said, "Now I retract the study". I call this knowledge terrorism. It is a serious threat to independent science and independent research. A very serious threat.

In terms of the cost of monopoly, we witness what it does in India. Globalisation allowed companies like Monsanto into India in '95. In no time they had started to lock Indian companies into joint ventures and licensing arrangements. Very fast, 95% of the cottonseed was a GMO cottonseed. I won't give you the story on how I sued Monsanto for illegal entry and they couldn't introduce it right away, but the main thing is that they started to take over the seed market. There was an 8000% jump in the seed price. Something that was available on the farm now has to be bought at 8000%. It doesn't really work to control pests, and we have a whole report that is available on our website. I couldn't find a better title for it than *The GMO emperor has no clothes*. Because their three claims, that it produces more, reduces chemical use, and is efficient at controlling pests and weed – none of it is true. Globally, that is showing up.

Very rapidly, our farmers started to get into debt, but it's a different kind of debt. The earlier debt was to the public banks where they could stand and protest that they won't give back the debt. Now it was with the agents of the seed company. Normally, the agents would make them sign and say that the farmers will be millionaires if they would just sign the paper, and mortgage their land. And the farmer couldn't even imagine that for cotton he would lose, because cotton is a cash crop. Then farmers started to commit suicide. The figure from '95 to today is 284,000. More than a quarter million Indian farmers, most of them in the cotton belt, and most cotton is now GMO.

In India we stopped the next crop, the bt-eggplant, and most parts of the world, people haven't accepted GMOs. Therefore, this dream of collecting a trillion dollars royalty annually from seed sales hasn't worked, but that dream is still there. That is why Europe got the seed law. Because if you can't put GMOs straight, then make local seeds illegal so that people are forced to buy seeds. First, will be hybrids, and then it will be GMO.

It's about royalty collection. I have worked very closely with parliamentarians and the movements worked very closely with each other and the environment committee and the agriculture committee sent back the draft [of the EU seed law]. It should never return, because seed is good only when it's diverse, when it evolves and is resilient, when it has quality and taste and nutrition. Uniformity is a wrong measure for biodiversity. Centralisation is a wrong management system for seeds which can only grow according to the soil and the climate. How can Norway and an island in Greece be imposed with the same standard by one agency in Brussels? Monopolies, centralisation, and monocultures go hand in hand and they are the instruments of power. We have to create instruments of democracy, diversity, and resilience.

The final reasons why we have to replace the old system, is because this old system really can't last more than another five to ten years, but in those five to ten years it can only survive by establishing a totalitarian rule. Totalitarianism on our farmers, where farmers cannot grow what they want and the way they want it. They are locked into a seed slavery. Pablo had those slides on slavery and someone asked, "Are you suggesting a parallel?" – I suggest a parallel. When starting to fight for seed freedom, it's because I saw a parallel. That time, it was blacks who were captured in Africa and taken to work

on the cotton and sugarcane fields of America. Today it is all of life being enslaved. All of life. All species. We've never had imperialism across the planet. Never. And of course, the farmers committing suicide are feeling enslaved and trapped and find suicide as the only way out. It is a totalitarian system because of the way knowledge is being managed. Science has been replaced by propaganda. How much newspaper space you can buy is what will decide what we will be called science. Not how much knowledge you generated.

And it is a totalitarian structure even at the level of safety. I find it very strange that a cucumber with its own personality is seen as a threat to health and phytosanitary measures mean straight cucumbers, a tomato of that size, an apple of that size. The sanitary and phytosanitary measures are actually pseudo-hygiene measures to destroy local food systems. I call them pseudo-hygiene. And I actually led a fight for truth when they tried to ban our mustard oils. They said mustard oil is dangerous, because it's made on a virgin oil mill, but GMO soy oil is wonderful for you. They tried to change India's laws. The women of the slums are the ones who called me and said, "Bring our mustard back". I said, "I'll bring your mustard back". We did a non-cooperation [campaign] against the laws that were banning our mustard and all edible oils made in artisanal ways.

Today we still have mustard and that law is still on paper. Just as the seed law that was attempted in India in 2004. A law like your European seed law was being brought for compulsory registration. That's how they do it. If you have a car you have to register it, it makes sense. But I have a seed from my great grandmother and I have to go to Brussels to ask, "May I please grow this?" That compulsory registration is a totalitarian instrument. If a family has been making cheese forever and suddenly "no, your stainless steel is not right". I just saw the most amazing oak caskets in a winery in Florence being thrown into disuse, because, "You can't use oak anymore, you have to use stainless steel". These are industrial mechanisms to impose industrial production. Whether it is at the farm in terms of food production or in processing.

What we are seeing is a very deep vertical integration of the food system. Five companies controlling seed, five companies controlling grain trade, five processors, five retailers. That's what we're talking about: twenty companies. All integrated, one to the other. And if you notice in California where they wanted to have labelling laws, it wasn't just Monsanto who resisted. Coca-Cola and Pepsi-Cola poured money into it, because they use the high fructose corn syrup from the GM-corn. So they won, and they won in terms of force feeding bad food to the people.

We know the harms that junk food has created, the obesity issue that was mentioned earlier. And from the analyses I've done over the years, this vertical integration system with the combination of Pepsi, Walmart, Cargill, and Monsanto brings 1% to the farmer. One per cent of the consumer euro, dollar, or rupee. Because it brings only 1%, it throws people off the land. It makes agriculture unviable, because of injustice. And then only 1% of the people are on the land, 1% return is coming and the rest is going in terms of corporate agri-business profits. No wonder they want to get into food. What we need is a 50% model. Fifty per cent should go back to the farmer and the local economy, 50%. And we do it in Navdanya, it's not that impossible. And if 50% return comes to the farmer, 50% people will be on the land. In any case, 50% are in the food system, except they are in the necro-economy part of it. The necro-economy is the economy of death. So they are making the pesticides, they are spraying the pesticides, they are driving the trucks, they are emitting carbon dioxide, all the jobs that are killing the planet. You add it up, it's still 50%.

We could have 50% in creative work. Creative work with the soil, creative work with the food. I know how excited young people are when they relate directly to food. Yesterday I was served the most amazing dinner before coming here by a young woman who gave up a marketing-managing job and she does raw foods. Delicious! If we would only unleash the energies of the young people. To take care of the soil and the seed, to take care of the jobs of our food and create work out of that.

In any case we are seeing an end to work. 50% of Southern Europe's youth are unemployed today, in Greece, in Rome, in Spain. I work with them and I work with the governments. In Rome, the government is handing over land to create employment and raw food. I have seen people thrown out of software companies moving abroad, now growing organic tomatoes. And they are happy! They say, "We don't make that kind of money, but at least we are happy".

And that's why at Navdanya I have started the Earth University, to basically have a place where the whole food system can be learned about through the mind, but also [through] nature as teacher, farmers as teachers – your own learning as teacher. And now we have every September, because of the demand of young people from around the world, we have started offering a course on the A-Z about agro-ecology and organic food systems. I hope some of you will come. But whether you come or not, food is the place, seed is the place where we have to reclaim our democracy and rescue the totalitarianism that is being put in place. It will happen bit by bit. And before we know it, we won't be able to make changes. We have a short window of time to reclaim both our bread and our freedom, otherwise we will have neither bread nor freedom.