

Transcript

Duration: 1:32:10

Forum Members

Martin Rees (MR)
 Rosamunde Almond (RA)
 Paul Linden (PL)
 Jenny Leivadarou (JL)
 Jake Reynolds (JR)
 Søren Laursen (SL)
 Miles Parker (MP)
 Lydia Smith (LS)
 Jonathan Green (JG)
 Bojana Bajzelj (BB)

Dai Morgan (DM)
 Gunel Huseynova (GH)
 Bryony Worthington (BW)
 Chris Brown (CB)
 Helen Crowley (HC)
 Howard Griffiths (HG)
 Therese Rudebeck (TR)
 Susan Owens (SO)
 Bhaskar Vira (BV)
 Kristen MacAskill (KM)

Helen Curry (HC2)
 Paul Dupree (PD)
 Ian Hodge (IH)
 Gemma Cranston (GC)
 Steve Evans (SE)
 Elena Kazamia (EK)
 Alison Smith (AS)
 Moira Faul (MF)

Main Meeting

MR:	Can I welcome everyone, especially Chris and Helen who are our two witnesses today to this meeting of the forum. Since we have some new people here I think we should probably start by going round the table with just a one sentence introduction from everyone. I'm Martin Rees, I'm a space scientist and I bring only unspecific wisdom to this subject but I've been the Chairman of the forum since it started.
RA:	Hi, my name is Roz Almond, I'm a conservation biologist by background and within the forum I'm the Executive Secretary that helps to bring together the groups like this and the topics and communicate what we're talking about.
MR:	And does all the work!
PL:	Absolutely. I'm Paul Linden, I'm in the Applied Mathematics Department and I'm the Director of the forum and my research interests are in fluid mechanics applied to the environment and sustainability.
JL:	I'm Jenny Leivadarou, I'm a PhD student in the same lab and I'm a civil engineer initially. My experience in problem is I've worked in irrigation systems a little bit.
JR:	I'm Jake Reynolds, responsible for our business platforms at CISL, so that's our policy on our business engagement and just to say thank you very much to the forum in allowing us to work with you to set this meeting up and to involve two people within our network of companies who we work with on something called the Natural Capital Leaders' Platform which we are going to hear probably a little bit more about later on. Just to mention we have a publication which has come out called <i>Doing Business with Nature</i> which draws on a lot of the kind of thinking and work which we'll undoubtedly be hearing from the companies this evening.
SL:	I'm Søren Laursen, I work in the Engineering Department working on sustainability in the fashion and clothing textile sector. I've been working with that subject for about 20 years, going right back to my thesis about recycling of water from dyeing of cotton and then I worked as a consultant and also in a fashion company and now I'm back doing work on the UK demand to meet textile and clothing demand.
MP:	Miles Parker. I'm formerly Deputy Chief Scientific Adviser at DEFRA, the UK Environment Department, and I'm now working with the Centre for Science and Policy here in Cambridge.
LS:	I'm Lydia Smith, I'm at the National Institute of Agricultural Botany just on the north side of Cambridge and I'm also Head of the NIAB Innovation Farm which deals a lot with interacting between researchers and business and farmers.



JG:	I'm Jonathan Green, I'm a postdoc in the Geography Department but I also work closely with CISL and get to be involved in projects about cotton and things like that.
BB:	I'm Bojana Bajzelj and I am a PhD student at Engineering and I work a lot on global sustainability environments.
DM:	My name is Dai Morgan, I'm a postdoc at the Institute for Manufacturing. I love factories and the stuff and the people that pass through them [inaudible 0:03:39].
GH:	I'm [inaudible 0:03:41], I'm Gunel, I'm doing a PhD at Genetics Department and at the moment I'm doing a short internship at Centre for Science Policy and [inaudible 0:03:52] the forum.
BW:	I'm Bryony Worthington, an environmentalist [inaudible 0:03:56] and I'm a colleague of Martin's in the House of Lords. I'm a Cambridge resident and I'm the Shadow Minister for the Labour Party on the climate and energy and I'm a visiting researcher at CSaP, the Centre for Science and Policy in Cambridge for this year.
CB:	I'm Chris Brown, I'm one of your witnesses for today. Do you want me to introduce myself more fully Chair?
MR:	Slightly more fully than that.
CB:	I'm Senior Director for Sustainable Business at ASDA which is a small regional retailer based in the North of England with a lamppost in Cambridge at the Beehive which I hope you are all very, very familiar with.
HC:	Good evening everyone. My name is Helen Crowley and I'm the Head of Sustainable Sourcing Innovation at Kering which is a luxury and sports and lifestyle fashion company, owns 23 brands and I'm in the Sustainability Department and I support all the brands as we move towards more sustainable business which I'll explain a little bit more about later. But my background is actually conservation biology and I've got a PhD in eco-physiology from the Australian National University.
HG:	That's an interesting lead-in because I'm a plant eco-physiologist and I worked at the Australian National University but I'm also Co-Chair of the Strategic Initiative in Global Food Security.
TR:	Hi, my name is Therese Rudebeck and I'm a current PhD student at the Department of Geography looking at global water governance.
SO:	I'm Susan Owens in the Department of Geography also, I work on environmental governance and politics.
BV:	I'm Bhaskar Vira and I work at the Department of Geography. I'm a political economist. I'm also associated with the Conservation Research Institute which I direct, food security issues which are a part of and [inaudible 0:05:49].
KM:	Kristen MacAskill, I'm in the Engineering Department but in the Centre for Sustainable Development within the Department. I'm a civil engineer by training and currently my focus is on post-disaster recovery and resilience.
HC2 :	I'm Helen Curry and I'm a lecturer in the history and philosophy of science and my work is in the area of 20 th century agriculture and also the history of genetics.
PD:	I'm Paul Dupree, I'm a plant biologist working in the Biochemistry Department here in Cambridge. I work on plant sugars and how they are made into materials by the plant and how we can use this in food or for fuel, biofuels, or for other material uses such as cotton and wood.
IH:	I'm Ian Hodge, I'm from the Department of Land Economy, I have a background in I guess applied economics and I'm interested in land, environment, agriculture, rural policy and land and institutions.



GC:	I'm Gemma Cranston, I'm Senior Programme Manager in the Natural Capital Leaders' Platform which is a part of CISL and just really pleased that Chris and Helen are able to join us today.
SE:	I'm Steve Evans, I work in the Department of Engineering, I'm also a Fellow at CISL and I lead the National Laboratory in Industrial Sustainability.
EK:	Hello, I'm Elena Kazamia and I'm a postdoc with Professor Alison Smith. I work with algae, one of the things that I look at when it comes to algae is biofuels and I have a broad interest in bioenergy and sustainability.
AS:	And I've already been introduced. I'm Alison Smith from the Department of Plant Sciences, I'm a plant biochemist, I'm interested in how plants and algae make things and currently we are exploring the potential for algae to do biotechnological approaches, but also for remediation, for example for water and for nutrients from waste foods.
MR:	Thank you very much to everyone. Before we actually start Paul wants to say something about next month's meeting.
PL:	I do. So as the regular members of the forum will know, and this really applies to regular members of the forum, we pick a topic each year starting in October and so we need to start to think about what we're going to talk about in October and particularly as we'll stop in June, that's not quite so far away as it might seem and we need to plan over the summer the meetings at the beginning of the next academic year. So what I'd like to propose is that the regular members of the forum come at 4.30pm next month rather than at five o'clock and we will have a pre-forum meeting to talk about some suggestions about what we might discuss next year and a few other housekeeping items and I hope we will also hear a bit from the parallel forum during that period. For those of you who don't know this is a forum which consists of postdocs and PhD students which addresses essentially the same questions as we do but in parallel and so we need an opportunity to cross link that and so I would like to ask for those of you who are regular members that we start at 4.30pm next month. I hope that's agreeable to everybody and we will send round the usual e-mail stuff and please start to think about what we might talk about next year, any suggestions from anybody would be very welcome.
HC:	Well first of all thank you again for inviting me. I feel very privileged to be here and it's always just lovely to come to Cambridge and I remember years ago where [inaudible 0:10:18] in the Zoology Department said to me as I was embarking on my PhD 'Yes, they occasionally do good research [inaudible 0:10:25].' Oh okay! But I've had very lovely experiences here ever since so it's very nice to be here.
	Let me give you a little background. I'm going to quote some cotton but I'd like to just sort of set up where we are, what we're doing at Kering just to give you a bit of context. So it owns 23 brands, I'm not sure how many of you have already looked into my bio and on the website, but our biggest brands are Gucci and Puma and then we have a whole range...we have 18 luxury brands ranging from sort of small like Stella McCartney, Alexander McQueen, through to Bottega Veneta and Gucci and then we have Puma, the largest of our sport and lifestyle brands and we also have smaller brands like Volcom and Tretorn and so on.
	I joined Kering about four years ago when they started a new sustainability initiative building on their corporate CSR initiative focusing very much on two main sort of pillars, one of them was the public targets that were announced about how Kering wanted to be a more sustainable business and how we would measure that, and also on the environment profit and loss which was how we were actually going to measure our footprint as a company. Now Puma as you're probably aware pioneered the environment profit and loss accounting based on the 2010 results but we have since then, over the last three years, expanded across the entire...across Kering, across now I think around 90% of the business by revenue. We've looked at...we've expanded the [inaudible 0:12:06] not only across Kering



but also its methodology itself has been expanded. I'm happy to go into more details about the methodology but basically it does two big things: it measures our environmental footprint across our entire supply chain looking at six KPIs, looking at water pollution, water use, air pollution, greenhouse gas emissions, solid waste and land use change across the entire supply chain and then it monetises that. So there are two big pieces of work: there's the measuring the footprint and then the monetising and we can go into lots of discussions about how whether the monetising is a good thing or not but it does...let me say this, after three years of working with this in the company it is an amazing internal change management tool. It is an amazing tool internally to show people and to talk with people about what sustainability means in a company like ours and to create a baseline sort of understanding about what...and context about what we're talking about so then we can have real discussions about what this means to good business, so that we can sort of define what sustainability is [inaudible 0:13:18] the company. Then my role then becomes a little easier because my role was originally Conservation and Ecosystem Services Specialist in the Kering Sustainability Department which was basically looking at raw material, it was basically looking at raw material sourcing because that's where we have our biggest input across our entire supply chain. So if we are interested in reducing our footprint we've got to look at sustainable sourcing of raw material. So most of my work is working with the brands, with their sustainability people looking at how we reduce our footprint and how we identify, support and source from more sustainable production systems.

Interestingly for me I was involved in cotton prior to being in Kering. I was a conservation biologist working for the Wildlife Conservation Society in Madagascar and we were looking at organic cotton production and working with local farmers around areas of high biodiversity as an alternative livelihood to obviously hunting or cutting down the forest or whatever. So we were looking at could organic cotton be part of an alternative livelihood option in Uganda, Zambia and Madagascar and we called it at that time Conservation Cotton. It was interesting because from a conservation biology perspective, a conservation practitioner perspective it seemed like a good idea but we hit very significant supply chain issues with that and so [inaudible 0:14:56] I started learning about the business perspective. So I have a little bit of knowledge about growing cotton in Africa at least anyway. So in the context of Kering why is cotton important? Well obviously because we're an apparel company, it's an important raw material for us. It is also incredibly significant in the environment profit and loss and if you saw Puma's environment profit and loss account one of the biggest impacts is water use for cotton production, but also climate change greenhouse gas impacts through the fertilisers that are being used in cotton production. So it's very important for us as a raw material and it's very important in the EP&L context and that's an important way that we...it's a significant way we view the supply chain.

So if you just said sort of...to answer this first question what are the risks? If you just said as an apparel company the risks in the cotton supply chain are probably the same as many other apparel companies experienced: a volatility in pricing, the social issues around everything from child labour to farmer suicides, the issues of integrity and quality and maintaining those issues of understanding traceability and where our cotton comes from and therefore linking it back or not to some of these social challenges that we face. So as an apparel company we have those as business risks if you like, but I think across all apparel companies it's the same. But as a company that is focused on natural capital accounting, which is basically what the environment profit and loss account is, we have different challenges because we want to find production systems and we want cotton that is going to have less of an impact environmentally and also because a part of our philosophy on sustainability as a group. Many companies is to try and find places where we can create positive outcomes as well. Where are those production systems for cotton that reduce our environmental footprint and also give us an opportunity to create social well-being and social value and for us that's organic cotton, it is very clearly organic cotton. The latest life-cycle analysis on organic cotton shows very clearly that in terms of nutrification, in terms of



	<p>contribution to global warming and greenhouse gases in terms of water, in terms of everything organic production systems are better. So in our EP&L that shows up very clearly.</p>
	<p>So given that we care about organic cotton what are the risks? The risks are a little more challenging in that organic cotton production is declining and there is not enough support of organic cotton at the farmer level. It's a real problem with seed, there is a real problem with pricing, the premium pricing that you get charged, when I go to an Italian supplier I can get a metre of organic cotton, it's significant, the premium, but that premium doesn't get to the farmer and so there isn't an incentive for farmers to keep producing organic cotton at the risk of oversimplifying obviously a very complex issue.</p>
	<p>So as a business risk for us if we care about organic cotton is there going to be enough organic cotton? Then is can we trace that and can we make sure there's integrity along the supply chain so we can be sure that in fact we are getting the organic cotton we want and it is delivering the benefits that we want along the supply chain.</p>
	<p>So on the first question that's the risk depending on how you frame them as a company that cares about environment profit and loss and natural capital accounting and as an apparel sector company.</p>
	<p>I guess I should stop there.</p>
PL:	<p>You were in a good flow!</p>
HC:	<p>Was I in flow? I don't know how you want to do this. Will we go through all the questions because I've really just focused on the introduction and the first question.</p>
MR:	<p>Why don't Chris speak now and then you can come back again and then we'll have a general ding-dong and discussion.</p>
CB:	<p>There were various challenges thrown out, I'd like to thank you very much for those. I'm just not sure how many people are aware of the cotton industry. We've been wearing cotton or using cotton for 7,000 years, so it's an enormous crop, it's a third of the size of the maize crop and as a retailer with a reasonable or one hopes a reasonable understanding of our food supply chains it would be pretty...it's self-evident to me and probably to you as well that we know absolutely nothing about our plant supply chains.</p>
	<p>The last time we talked about cotton was in relation to the social dimension and could we take Uzbekistan cotton out of our supply chain because of the issues with child labour and when we tried to do that we were told it was impossible, supply chain traceability, etc, etc, etc, we sort of retreated from that. But I'm very conscious that this isn't something which is coming from customers - no customer has written me a letter about cotton sourcing, I've never had an e-mail about cotton sourcing, it's not one of those topics which is top of the mind. This is one of those areas which as a retailer you invest time and resources into because you believe it may well become...and there's lots of things that we do around that and other areas of the business. [inaudible 0:20:29] listening to you all talking about sustainability, it's one of the terms I try to avoid using at the moment. I spent a decade trying to get people to use it in my business and now I'm trying to get them to talk about stewardship, because the dictionary definition of stewardship is when you have to do something on behalf of somebody else and I think that's what we're looking to do here. In our tentative steps into trying to understand cotton it's about recognising a massively important agricultural crop which has had very little attention drawn to it but one which we have huge influence over, we are the largest volume retailer of clothing in the UK through the George brand. Not based in Paris, based in Leicester - it's not quite as exciting!</p>
	<p>So global production is 20 million tonnes in 90 countries. Interesting one for me, that's 2.5% of global arable land is producing that fibre, in India funnily enough it's 5% of arable land. So we very often have debates around these types of forum, around food versus fuel, it's not, it's fibre, food, fuel. It's an enormous...well again it's a hidden area.</p>



	<p>Cotton then is an interesting crop. It needs a long frost free period, it needs some sunshine, it needs moderate rainfall. It's quite tolerant of salinity and drought but it also comes with, due to where it's been grown, lots of interest around that. So if you go and Google you'll see lots of people terming it as a toxic, thirsty crop and that relates to the very high proportion of agrichemicals which are used in cotton. But it's also an interesting crop because it's got a very high level of acceptance of genetic modified crops, the Indian subcontinent is generally 95% GM. Again I've never had an e-mail question about 'Do your T-shirts contain GM cotton?' My honest answer to that would be yes they do because that's the type of market that we are operating within.</p>
	<p>Whilst I talked about although how it's a hidden crop and a hidden topic and when I went and researched this, funnily enough in 1903 next to restrictions coming out of the Americas the British Cotton Growers' Association was established, not as you might suspect in Manchester but in Nigeria because the British classes who grow cotton throughout West Africa to try and open up and I suspect that nobody ever thought about what we were doing to water quality, soil issues and the like. So I think we have a bit of a duty of care for those resources which we rely upon, be they water resources or soil resources or social resources.</p>
	<p>So there is some good news in terms of increasing productivity in the world in which we live in with increasing demand. The one stat I always like to use in these types of debates is for the first time in mankind's history there are more people living in cities than there are in the rural environment - we are massively switching across. But that doesn't stop the fact that we have 100 million smallhold farms producing cotton and 90% of whom are across the developing world. So that social agenda has to be linked through into what I would say was a cautious [inaudible 0:23:45] productivity agenda because people are still going to want to use cotton because it's a very good crop and I hope it's a good example, not only for the discussion this evening but also for the way that we manage resources going forward.</p>
MR:	<p>Helen, would you like to come back on that with the other questions?</p>
HC:	<p>[inaudible 0:24:08]. So where do I start Gemma? I'll start with the second question, what does the cotton industry or business need to know just to cure its supply? So if I focus on...okay, just one big picture thing before I talk about that second part is that I think there is a...what worries me about organic cotton for example is there is a sort of fundamental lack of awareness about what an organic production system really is and that it's actually a diversified production system and you're not just talking about cotton when you talk about organic cotton, you're talking about food crops, you're talking about inter-cropping, you're talking about rotation. So when you talk about yield on cotton, sure, the yield of cotton in certain areas might be less in organic systems, not everywhere. But you're also getting cotton seed, oil, you're getting whatever [inaudible 0:25:10] cotton, beans, sunflowers, whatever the food crop. So it's a diversified system so it's very hard to...it's apples and oranges or...when you're talking about a sort of monoculture production of cotton versus a more integrated diversified smallholder of cotton and I think that's important to keep in mind because there's a lot of figures that are thrown around about yield, about how we're going to clothe the world, how we're going to feed the world and so on and the yield issue and the water use issue and everything is tied up into what sort of production system and are you talking about rain fed or irrigated in what part of the world. So there are subtleties to the discussion that we need to keep in mind, I think that's important.</p>
	<p>So when I talk about the lifecycle analysis that was done it was trying to take an average looking across the world at different production systems and look at is organic...how does it turn out versus other production systems, mostly conventional cotton. So I think that's an important thing and I think the social...I think the issue I've given that you raised, genetic modification, is there is an issue around do we need genetic modification given the volatile world that we are going into with climate change and so on. That's one piece of a discussion but then there's the way that has been turned into a business and the fact that farmers can't own seed and I think that's a separate discussion and that's a social...that is a</p>

	<p>deeper and powerful and alarming issue that needs to be discussed and that sort of needs to be taken apart from its genetic modification, is transgenic genetic modification good or not, or should we do it in the world we're facing or should we go back to more conventional, traditional genetic modification which is breeding varieties which they did in SIRA or in Australia and so on. So that's a different discussion - the technology versus the social consequences of genetic modification and the businesses that are created around that. So I just wanted to put that out there on the table because I want to hear from you about all that because I don't have all the answers. So for us if we just focus on organic, that all being said, and we are far from being 100% organic in the Kering brands but it is certainly something we are looking at moving towards, is to how can we get organic that's the quality that we want. And that for us, if I look at this second question, what is it that I need to know? What are the gaps and the burning issues? I think there are a couple of key issues. I think the issue around seed, access to seed for farmers so that they can continue growing and good quality seed is an issue and I think that's something that more research needs to be done. I think traditional but looking at tradition...</p>
GC:	<p>Sorry, I didn't mean to interrupt, I just wanted...on your previous point about organic cotton is there a uniform definition of what would constitute an organic...?</p>
HC:	<p>Yes.</p>
GC:	<p>And is that...? What is that set...?</p>
HC:	<p>Non-genetically modified for a start and then it's not using synthetic chemical pesticides or fertilisers. You could use biologically created pesticides and fertilisers like from the Neem tree or whatever the oil, you can use that [inaudible 0:28:43], fossil fuel...</p>
GC:	<p>So is that standard...is that internationally set by...?</p>
CB:	<p>If you go on the website IFOAM it gives you a whole series of international organic standards.</p>
HC:	<p>There is a European one, there's a North American, there's a Japanese, there's the Australian but they are all, as Chris said, under IFOAM and there are very clear guidelines as to what organic cotton... The big difference is no sort of synthetic fertilisers or pesticides and no genetic modification. So seed is an issue. I think also looking at, given that we are facing volatility and climate change issues what are the best varieties in these different areas if we want cotton to continue in India, we want it to continue with these smallholder producers, how can we, what is the best varieties for them to do this and how can those varieties match with the best rotational crops and food crops? I think there's a lot that could be done in those and it would have to be very specific and that would help us because it would mean organic cotton is continuously produced.</p>
	<p>The other issues are more supply chain issues like integrity and traceability. How do we ensure that the organic cotton we're buying from Madagascar really is going through the supply chain and the spinners and the ginners...I don't know if you know, you clean the cotton from the cotton seed and you get the gin lint cotton and it's spun. The spinners are real bottlenecks in the supply chain and that's where there's a lot of loss of traceability, so you need to work with those actors in the supply chain and get them engaged in wanting to have integrity, wanting to be certified and so on, so that we can guarantee a nice clean supply chain. And by opening that up you can then also look at cost issues, because let's face it one of the reasons that people don't buy organic cotton in companies, including mine and including many of my brands, is because it's expensive or it's more expensive than commercial cotton. So how do we deal with that premium pricing issue? What do the farmers need to be rewarded with to keep them producing and have a reasonable livelihood and how does that translate to cost in the supply chain? So I think there are some real issues there on opening up that supply chain and questioning the pricing structures and innovative financing for primary producers.</p>



	So I think on question two those are some really key issues. It is less about like my business as our business is making clothes and accessories and more about making sure that raw material is really good and well-priced and what do we need to do in the supply chain and that we can guarantee the integrity and the potential.
MR:	Chris, any comments before we open up?
CB:	Lots, but which ones do you want me to pick up?
	I agree, there are... We have commodity supply chains which are incredibly efficient logistically and they have been developed because of the [inaudible 0:32:13] and what we're now seeing businesses taking responsibility for their supply chains are unpicking aggregated supply logistics and it's a real, real challenge. If we need to trace back to Indonesia to make sure that the palm oil I'm taking in hasn't come from high conservation value or peatlands is something that we've not looked at for 100 years and the supply chains are designed not to let me do that because that's the best way to shift large amounts of products through [inaudible 0:32:42], exactly the same on cotton. So we're going to build a new business function which is this one about how do we deliver traceability and we're trying to look at different models for doing that. Things like mass balance and certification, green certificates are operating in palm oil and soy, not as yet in cotton but there are approaches that could be looked at.
	I think the question over which production system is going to be right, I suspect that we'll be here for a long time trying to actually prove what the ultimate answer is on that. But I'm pretty sure that what we need to think about are the outcomes the production system is delivering, you can choose whichever way you want to get there but ultimately we need to know for a given crop and given geography what is it that we are going to turn around and say 'Okay, that's justifiable, we think that's the right approach.' Incredibly difficult because you end up with landscape and cultural aspects to it as well but I think in the first instance just concentrating on the natural capital and trying to solve those series of equations strikes me as being a way to just try and elucidate some of this.
MR:	Thank you. We can offer up to questions. Who would like to start?
	Can I just start? I mean you talk about organic, now is organic actually better ecologically or is it just what your wealthy customers demand?
HC:	I wish my wealthy customers demanded organic cotton, but they don't actually [inaudible 0:34:17] part of the issue.
MR:	But organic is actually ecologically better?
HC:	Yes. I would say it is absolutely clearly ecologically better and more sustainable than any other cotton production system. Now whether it is the right cotton production system given a whole lot of other factors, that's a different debate, but ecologically when you look at impact on climate change, impact on soil biodiversity, impact on water quality, nitrification potential, every indicator that you could use which you would want to if you were doing a natural capital account, organic is better. So yes, from an ecological perspective I don't think...we could argue about it but then it would be a question well in this certain situation, under these climatic conditions, better cotton is better. But it would be hard because every other production system uses synthetic, uses fossil fuel-based fertilisers and uses pesticides, so it's pretty hard to balance those out ecologically and say... And if you're talking about sustainability and say 'Well can you keep doing this for seven generations?' I would argue that organic production you can, you can't argue that with other production systems, but [inaudible 0:35:37].
GC:	How much of that is an issue of scale? So how...presumably producers of organic cotton operate at a much smaller scale than GM or sort of fertilised cotton, so is it scalable to the same amount and would it still be sustainable? Do you have a sense of that at all?



CB:	Well absolutely right, cotton is in within rotation so you need to take the hit on productivity from the rest of the organic crop so we'll all starve. I'm a bit hesitant about [inaudible 0:36:13] global food system based on the musing of Edwardian aristocrats.
GC:	What do you mean?
CB:	The origins of organic. Do you know the origins of organic? It's not coming from some mountains with tablets of stone [inaudible 0:36:33] one or two ideas. But people can say well the production system is fine, it's what the outcomes of production systems are, so if we know what the targets are and we agree for a given area of land this is what it's got to deliver then there are a myriad of ways of doing that, and I think that's where the debate sometimes struggles. It becomes very polarised into...and I can understand why because it needs to be clear and it's not.
HC:	Just musings of Edwardians, I don't know, but traditional farmers in Africa have been doing organic agriculture since they've been farmers. I mean it's their natural...it's a default system when you can't afford chemical inputs. I mean whether it's the most efficient system, that's a different issue and I agree, if your end goal is yield under any circumstance, I just want to maximise yield, perhaps in certain areas conventional cotton production is the way to go, like Australia, like the US on large-scale monocultures. But if your issue is about sustainability in terms of ecological impacts and I would argue social impacts, then I think you have to question that model in different parts of the world and the majority of cotton is produced by smallholder producers.
SO:	It's going to be a rambling question because I haven't quite formulated it tightly in my mind, but thank you both for your thoughts. I mean one troubling thing that I'd like to open up is possibly a tension between sustainable consumption and reducing consumption because clearly we...I mean in some ways sustainability is a kind of grounding which arguably might even encourage more consumption. So that seems to me to be slightly an elephant in the room in this debate. Perhaps to introduce a note of scepticism, if I'm shopping wherever and I pick something up that claims to be sustainably sourced I'm immediately profoundly sceptical. It seems to me that we're looking at incredibly complex natural and agricultural, financial, trade, economic systems interacting with each other to get a product from its source to the point where someone consumes it and when indicators are used they are extremely reductionist, they are in danger of always of focusing on particular issue in that very complex chain. So whatever it is you're looking to buy to reduce food miles or to be organic or to reduce child labour or all the other good things then it's extremely difficult to know what effects focusing on one thing is going to have on other aspects of that very, very complicated system. It's almost as if the environmentally or socially conscious consumer is faced with an impossible calculation to do at the point of purchase. You know am I about to buy something that is quite good for the environment but socially rather bad or vice versa or does it achieve both? I'm not sure the simple sort of indicators that we see on labels can actually help us there. So I wonder if we could open it out a little bit to...I don't know whether...it's partly a question of how do we know when something is actually sustainable in any rounded meaningful sense and it won't be captured by monetary indicators, we know that for sure. And how do we know that if we pursue some particular fad of ours, I mean one of my fads is that I quite like fruits in season and I don't...except for bananas, they're okay, but...
CB:	Which is the biggest selling fruit in the country.
SO:	Lots of people have those sorts of preferences and how do we know when we are pursuing those that we're not causing other problems along the line?
DM:	I was rather taken by the comment on the organic cotton premium doesn't reach the farmer, I'd like to know where it stops and who is taking the penny.
HC:	Oh, so would I.



DM:	And can we get people in the room please and you also...as I understand the cotton system and in particular water delivery, drip feed versus throwing water eight hours on a sunny day over a large area through the systems that we tend to see in pictures, but we know drip feed is much more efficient but is difficult to finance and you talked about innovative financing for primary businesses. I'm interested in what you think the trick is that allows small businesses to use the most efficient methods because at the moment they are really rather inefficient.
IH:	I wanted to just make an observation. When you look at organic production in the UK and I suspect most of Europe too the yield per unit area is lower, so that when you look at the environmental impact per unit of production actually the difference between organic and conventional is much less clear and often actually conventional is better on that basis and the question is well if you can concentrate your production into a smaller area of land then you've got a bit of land to do something else. What would you do with that and you can do something, produce energy or biodiversity or something. So taking yield into account makes the comparison more complicated.
	The question I wanted to ask was about, right at the beginning when Helen you were talking about monetisation, and I guess I wanted to know what is the criteria for determining how you monetise environmental impacts and it seems to me I can imagine how you could do it against a sort of profit and loss account from a private perspective. An economist would say what is the social value of or the social harm done by and be interested in a sense in everybody's preferences and we try and meet, they would try to aggregate up to work out the social cost. It seems to me that you are somewhere I suspect between those and I don't know where you are I guess is the question.
HC:	I'll respond backwards because that one is relatively easy. In the environment profit and loss account the valuation is done in a relatively complex way by PricewaterhouseCoopers and this is where they make their money because they've got this blackbox.
IH:	Yeah, so you don't know [inaudible 0:44:22].
HC:	But I'm actually convinced that it will become open sourced, I think eventually this monetisation, these coefficients that they use. So basically what you do is for every cubic metre of water, for every tonne of CO2 or greenhouse gases, for every kilogram of solid waste or whatever there's a coefficient that's applied to that to turn that into a euro measurement and that coefficient is affected by where in the world you're sourcing this. Because obviously the value of water in an arid area is going to be higher than the cost and value of water than in Italy.
IH:	Doesn't every opportunity cost?
HC:	So it's cost to society. So they do this calculation of the cost to society, the health by emitting this tonne of CO2, it's like the Stern Report used for greenhouse gas.
IH:	I don't know where he got his values from either.
HC:	So there's a whole science behind that of how you value the cost to society of arsenic poisoning from gold mining, how do you value that cost to global society or local and there's adjustments they make for impacts on local communities as well as sort of global society. So that's where the cost...so when we talk about cost it's not a replacement cost, it's not a market cost, it's basically like the Stern Report used. So they said basically a tonne of carbon is around \$76, it's not \$7.50 when you're buying a tonne of carbon in REDD-plus offset, it's the cost to society of omitting that in air pollution.
IH:	So the principle is society...
HC:	The principle is, yes, social cost. So that's relatively easy. And there will be a lot of debate about that and bring it on as far as I'm concerned, like let's have that debate, let's bring it right...it's Deloitte, Ernst & Young, PwC and a lot of them put it out there and let's have that debate right? And let's see what comes out of that and whether we can come to some



	consensus about how do you...
IH:	Wouldn't they lose their business if we did that?
HC:	Yeah. Well...Chris will generalise more about the natural capital protocol work and the work that is going on there about... I think it's not going to happen soon but I think at some point we have to have the discussion to begin with. But you still have the real impact measures as well, so you don't have to just go to the [inaudible 0:46:58].
GC:	Just the appropriateness of the type of valuation technique is really where a lot of the discussion is going, it's not necessarily getting agreement on those coefficients, those conversion factors that Helen's referring to, it's more what's the most appropriate methodology that should be followed that I think is where the big four are going to be able to keep some of their sort of juicy secrets but have a common framework that others are able to follow.
HC:	Right, right. Because it still requires a lot of work to [inaudible 0:47:30] those.
GC:	Absolutely.
IH:	My sense is that economists are moving away from it, that economists less and less believe these sorts of numbers.
HC:	True but...Yeah, I've had these discussions before but let me say in the context of the business it is powerful to be able to have an equivalency factor, because if I go to the supply chain people and I talk about a tonne of carbon dioxide or a cubic metre of water from... 'Oh your cotton is more expensive because it uses that much cubic metres of water', they are not...it's meaningless, but if I talk about the euro per kilogram impact they are all there, they just sort of get it, for better or worse they get it.
IH:	Well essentially it says the same sort of thing doesn't it? [inaudible 0:48:09].
HC:	And it helps compare across impact.
MR:	Chris, do you want to take the other questions?
CB:	I agree, but that's just the nature of us understanding and getting better knowledge. I was just recounting to Jon, we were talking...it used to be talked about food [inaudible 0:48:27] and now nobody realises there were conflicts associated with that, so then we went to carbon footprinting and we went through the daft stage of Range Rovers being carbon offset, which that market disappeared fairly quickly, we realised that was [inaudible 0:48:40] and we move on. So no, I don't think there is a final answer to what is sustainable because we all understand why the circumstances will change. The question about SME funding, absolutely, the problem is the disconnect between the very large funders who talk in hundreds and millions of pounds and dollars and the fact that for me to do a little project I'd probably need about 10 grand, because that's as much as my business will risk. Any more than that it starts having to go to American lawyers and by which time [inaudible 0:49:07].
	So there we are saying there's all this money available in World Bank, in IFC and it's all there...
DM:	How do you help your suppliers buy drip feed systems?
CB:	We can't, we can't access it, we just can't. There is a translation issue, they start talking about boutiques and things like that and it just leaves me cold. So at the moment there is a massive translational issue. The problem about irrigation and don't forget there's only 27% of cotton is rain fed, 70% plus is irrigated, and you then have to have the appropriate technology. So you can't do drip because the capital cost won't go for it one jot. If you go drip feeding then you'll go on to horticultural crops and then people will complain about the seasonality of it. That's what's happened in Morocco. So they have effectively said you can have access to the water as long as you drip feed, so they'll stop from using rain gun on maize and makes them go over to horticulture which is why when you look on the



	shelves you'll see much more production removed from Morocco. Now whether that's a good thing or a bad thing we can have a conversation about. And it's appropriate technology because I had a go at a guy in South Africa and he said 'That's great Chris but I've got old Joe who knows how to run the diesel engine, who knows how to do the rain gun, if I start to put filter irrigation in I've got little electric pumps and it's run by a computer, I need a graduate to run those, I can't find one.' So there are some social dimensions to those types of conversations. It seems dead easy here but when you're in the wellies on the ground those are the other issues.
HC:	I think the issue about the financing is a really important one because as a company as we want more sustainable commodities, say we do, so you [inaudible 0:50:42] does a natural capital account, so you do a natural [inaudible 0:50:44] and say 'Okay I'm going to move to more sustainable', where are they? Where is more sus...keeping cotton aside for the moment because I would say organic is, but even then are you getting...is it in the area that you need it to be, is it the right quality that you need? So who is investing in sustainable commodities, really investing, especially at the small-scale? Now the cocoa buyers are doing a good job I think, the hot chocolate guys. Coffee, I mean you might have different thoughts on that, but they seem to be starting to look at how to do it. But a company can't...we can't pay for the drip irrigation of smallhold farmers, but it would be great if IFC or World Bank or someone did and I think, as Chris said, there is a real challenge in identifying that that is something that needs to get done. One of the big issues for cotton farmers particularly in India is there is a gap between when they are paid and when they do the harvest. So they have to outlay money, they have to get...they're in debt, they have to pay people to pick or they have to...or they don't get paid straightaway and the spinners... So there is a flow of financing issue that could be fuelled by innovative finance mechanisms like micro-loans or you could work with spinners to make sure that they pay the farmers on time and so on. So there are ways to do it, it's not rocket science, it's just directing the development guys and talking to them and saying 'Can you fund this?' And it may not be as sort of sexy of other things they want to fund so I think that's an issue.
	I think the issue of where does the premium go is a really important one obviously. Keep in mind that you do need...I mean obviously there is an extra cost to segregating organic cotton because you've got to clean your gin out of all the conventional and you've got to keep it separate and your gin you're organic, you can't have contamination and then you've got to have your spinning machine set up so you just spin the organic. So there's an extra effort along the supply chain so it makes sense that there is an extra cost, but the problem is that the farmers aren't getting paid anything extra in general. So there's got to be more transparency so people are capturing it, which happens in other supply chains, people will capture it where they can. So until we demand transparency and push through certifications and things and say we want it and work with our supply chain, I think there's a lot of work still to get done there.
JL:	I wanted just a little bit to step back and think as a society...well we talk a lot about how to secure the supply chain but as a society is our demand to cotton healthy or is it too much or is it normal? I don't have answer to that. I would like to hear a little bit more about that and if it is too high what other alternatives we are considering to cotton. Are there other materials or kind of innovation they are doing to produce other materials? And also what do we do for recycling, is it possible to recycle it so that we actually can also reduce the demand?
SL:	You mentioned that you have decided to go for organic, have you considered other schemes like the Better Cotton Initiative, if there is something for your company? The one that [inaudible 0:54:21] are now running is another way of doing it.
HC:	It's a good question. I just put back to you why is better cotton better than organic?
SL:	It's not better, I'm just asking you have you considered going that direction because you also have raised the issue about how can you as a consumer be sure and the one thing



	that organic cotton offers is there is a certification scheme and you track it all the way, so it is organic cotton, but better cotton is another way of saying that there is not enough organic cotton out there and then some companies have started working in that direction. And also I would like to hear if you have any views on is genetically modified cotton better than conventional cotton?
JL:	I just want to add something in the conversation. I tried to understand how much does it cost one hectare to have cotton. So in one hectare you have 350 kg of cotton produced, conventional cotton, and that cost to the farmer from €160 to €310 and I can analyse that: it's the land rent, the fertilisers, the employees, irrigation, everything. So he goes to a cotton gin and he sells this 350 kg for €200, plus €70 that it's usually subsidised, especially in Europe, so he gets €270 for 350 kg, that's the producer. Now I don't know where the chain...where you lose it in the [inaudible 0:56:14] but that's...
CB:	It's quite a high yield, if you look at the average yield it's closer to a tonne.
JL:	Yeah, the average is...I think it goes from 200 in Africa to 500 in Australia, something like that, the range of cotton production per hectare.
CB:	A tonne to the hectare is more usual.
MR:	Any comments on cutting consumption?
HC:	Well it's...I mean originally my idea for this presentation [inaudible 0:56:38] this comes up, sustainable consumption which is a valid issue. Of course we're not consuming sustainably, we're using how many more planets than we actually have in resources and you could argue nothing that we do at the moment is sustainable. But within that we still have to make decisions about what is better and what is the better system that we can do, given the fact that the world is the way it is, and how can we start leveraging change and where do we leverage change to make it better. I think just on the sustainable consumption from what...and every...individually we all set our own threshold, some people don't eat meat, some people do, some people only eat local, some people only wear organic, some people don't. I don't only wear organic, we all find our own personal thresholds of what we deal with. I think globally the issue about...what we're trying to do is say let's try and make our products better and the way that we judge that is through looking at our environment impact and our social impact. So at least we can say 'Okay, we're trying to make better products' and the way we assess that is through the EP&L. That doesn't mean everything we make is perfect and we're driven by profit margins as much as the next company but within that it's like about making better product. I think the certification schemes as you mention are good in that now there is...I mean you can't label something organic without going through...and I know this because our brands are doing it. You must have this too? You have incredible regulation to label something. So if something is labelled you can be as pretty confident as you can be about anything that you buy that it does, there is some integrity there in those labels. So I do think while it's confusing, I'm not saying which is a better label or whatever, and I have stood in front of honey in wholefoods for ages trying to think...I mean so do I buy locally produced honey from Zimbabwe that's been shipped or do I buy fair trade for more honey and thinking, okay, what...and we all figure [inaudible 0:58:58], it's confusing, but at least we have choices out there and we can do that. I think on the issue of can we maintain our current consumption, no, are there technologies in place to recycle cotton, yes and they are getting better all the time and there's a lot of discussion about closedloop economies and closedloop recycling and how we can take viscose, cellulose and polyester-based fabrics and fibres and recycle them and I think that will be a breakthrough. Then I think you'd actually probably have fast fashion at cheap...if you can do closedloop recycling. I think currently there's cheap fashion and I have brands that sell cheap fashion too, you're not internalising all the externalities at all, you're not including all the real costs, you're just not, but consumers are demanding that cheap...those prices.
	So I think that closedloop recycling will open up a new way of having very affordable



	clothes that don't have a big impact on the environment.
CB:	I think recycling is coming into all of the thinking about...again, it's slightly fuzzy but it's one of the things we are all trying to work our way through. Yes there are other fibres. The UK used to produce quite a lot of wool at one stage, you wouldn't necessarily want to wear it I have to say, it's traditionally more carpet or... But even that, so viscose which is fine but where is the wood pulp coming for the viscose which is one of the things we're starting to look at and that's again another supply chain to unpick and try and work out are they actually coming from well-managed forests [inaudible 1:00:36].
MR:	Thank you very much. We'll take a break now and after the break Roz has fingered three other participants to make short five minute or so presentations or less and then that will lead into general discussion for the time until seven o'clock.
MF:	There's just one question from over here which I think it would be really interesting to hear your views which is how do you decide between, was it called better cotton versus...and also the GM issue.
HC:	Well I can say from our perspective and this gets very...this is where the environment profit and loss and natural capital accounting helps. In terms of that it is clear that organic is better. So in our world, in my world if you want to say what is the gold standard for ecologically sustainable production it's organic and socially arguably there's a lot of value in organic production systems because farmers can own their seed and so on and so forth. So I think for us...so in that way, so better cotton...our brands use better cotton, better cotton is better, it's not the best, what can I say? It depends what you're after. If you're after cotton that is not as bad as conventional at the same price as conventional then you go with better cotton and let's be honest, that's why better cotton is succeeding because it is cost effective. It wasn't initially but they have a very clever business model where you pay the extra costs of it in a different way, it's not through premium pricing in the supply chain, you give a contribution. And I mean that in all honesty, it's a clever way of doing it because if you add premiums in your supply chain that's a really tough sell, but you might be able through CSR funding or whatever you might be able to pay... So better cotton scaled fast because you could get cotton that was less bad than conventional, quantities and they had a whole system that could help make sure you get that quantity and it costs you about the same. So that was great if that's...and it's better, it's not the best.
After Coffee	
MR:	Okay folks, we've just got half an hour before we break and we've got three speakers and let's have first Bryony Worthington.
BW:	I'll keep it brief as we don't have much time, but thank you both for your presentations.
	I'm going to say a few words and I'm going to ask what I hope are questions that will provoke some debate afterwards.
	It seems to me that we've embarked on this discussion with a kind of preset condition that we will be using cotton and that cotton is going to stay roughly at the same volume of production as it is today and that's kind of what we're working out. So I'm really interested in what is the big trend in cotton use and production, is it declining or staying the same, growing? Has the arrival of synthetic fabrics reduced the volume of cotton that we're using or not? What other synthetic fabrics could we be moving to and I suppose the question that was asked in the last session which I don't think we perhaps looked at enough is how can we close the loop in recycling so that we get the absolute maximum out...if we're going to devote a hectare of land to this product which is quite an intensive, socially difficult, water intensive product we need to make complete sure that we get the most out of that hectare by closing the loop, recycling. Related to that I think was also a question about durability. So I'm fascinated because here we've got high end Gucci and George is great but...and one of the selling points of a Gucci product is it may be damn eye wateringly expensive but it will last a long time and you can wear it for decades probably because it will have that



	<p>kind of durability, whereas sadly some of the things that are produced more on a short-term fast fashion basis, they literally are throw them out after three weeks because they've fallen apart. So how do we price...? I mean it is priced in actually that because obviously you get what you pay for, but how can we look at the entire sort of business model that is based on cotton and turn it around so that if we're saying this is a valuable commodity and it is because of all the externalities that are associated with it, what is it going to be used for in the future and what are the alternatives that will mean that it's over time reducing our overall footprint on our planetary resources? Because this particular commodity, let's face it, isn't keeping people alive by feeding them and isn't producing energy which are the two basic commodities that we need to focus on. You're producing apparel which is great but there are loads of ways of keeping ourselves clothed and warm. So that's my contribution then and I'd be very, very interested in your responses.</p>
MR:	<p>I think we'll have two other contributions and then general discussion and responses. So Lydia was next I think.</p>
LS:	<p>So I wanted to address quality of production which came up quite a bit in the early discussion and quality of the final cotton. So first of all the quality of the production. I find it saddening that these discussions that look at sustainability of production and in particular pick up on organic and conventional agriculture sort of are so very polarised into if you're doing a...if you're going down a GM approach then you are necessarily high input conventional agriculture as opposed to the organic approach which by people's expectations, but not necessarily in reality, is much more sustainable in terms of maintaining diversity. So what is it that is actually out there in terms of GM cotton, let's remind ourselves, there's two transformations that are mainly used by the Australians who are pretty much 100% GM these days: one is Bt which means that the cotton contains a small amount of a chemical if you like that comes from a bacillus and therefore when the caterpillar comes along and eats it then that's the end of it. So that's very much about preventing insect predation. The second one is Roundup Ready which is to enable utilisation of herbicides earlier on in the cycle. So the first of those is all about significant reduction in inputs, particularly insecticides and I'll come back to that. The second is to do with reduction in theory, utilisation of herbicides. So if you're saying let's go for an organic approach because we want to reduce inputs, we want to reduce toxins in the environment and we want to make it perhaps cheaper to farm if you're a farmer, I'm not sure that we're actually going down the logical route here. So if you say okay, let's go for Bt only, and I agree that most of the Australian varieties have got both those transformations, then in theory you can have very significant inputs, either putting aside the whole herbicide which means you've got a reduction in biodiversity from the point of view of plant life.</p>
	<p>So again, if you go and have a look at what's going in Australia they have reduced their inputs by 80% and that's really significant and if you go and talk to any Australian cotton farmer, and I have done, they are really impressed by the way that biodiversity is coming back to their fields. You know they have organisms there of many different fila [0:06:03 sounds like] that haven't been seen for years in their apparent experience. This is a conversation that I constantly have about crops that have been transformed. Now I'm pleased to say that the Soil Association is also now engaging in this so I'm sure you all know that the Soil Association is involved with certification of organic in the UK. But the Soil Association now in the UK is looking at low input and I think that low input is such a brilliant way to go, regardless of whether you have a particular wish to be organic, because you can gain the input reductions and efficiency and reduction in cost and you can also gain biodiversity by a reduction in potentially toxic inputs into the environment. So I really wish that we would now have a discussion about organic versus low input and with the potential utilisation of GM, which for goodness sake could enable organic in such a brilliant way. So if we just look at a completely different crop, if we have a look at take-up of Phytophthora resistant potatoes which is ready and waiting the amount of toxic chemical input into the UK environment to protect potatoes against potato blight would be enormous and would have a very profound effect on aspects of sustainability.</p>

	<p>So when we talk about sustainable intensification we should look at sustainable use of resources right across and not get hung up on any one of them. Just a little thing, and I do come from bio so I have to bring in varieties here, but when we talk about quality of cotton don't let's forget that the genetics of the cotton variety is much more important than the way in which you drive the agronomy. So if you look at research that is ongoing at the University of Durham which we've shown at Innovation Farm in the last couple of years you will see that the plant genetics should be where you're going for looking at quality and serious, interesting work that is being undertaken there, not just in the beautiful softness of the fibre if that's what you're looking for, but also the quality of the oils coming out of cotton seed.</p>
MR:	Howard was the third I think.
HG:	I don't need to say very much for the last few minutes because the speakers have shot most of my foxes as it were.
	<p>I think there is a question is there a conflict really? We've heard as if there seemingly could be a conflict between two contrasting suppliers, some...and I ask them really we still...I think I've asked this community before to really consider where the market...who's buying this stuff and what your target audience is in terms of that? And in terms of the wide range as one could argue for any other debate between GM and organic it may well just come down to one of cost at the end and actually how much you're able to charge for your product, if indeed you can maintain that intensive scale of production.</p>
	<p>And I think no, in the long run we'll probably end up in 20 years or so you can go into a supermarket and you can buy organic bread, you can buy conventionally farmed bread and you can have wheat that has GM...bread produced with GM and there will be a differential price. So really sometimes I think a lot of the arguments we've been hearing about often [inaudible 0:09:47] ideology rather than on practicality. Leading onto practicality I do think other than Bryony's take which is to sort of say well...to really ask the big question well can we go on...will we be growing cotton in 20 or 50 years' time, is the other question which I think has been touched on which is the extent that we can afford...we need to improve the agronomy of cotton or fibre production in terms of water use and salinisation which I think is a real problem and I think those more practical issues are likely to alter both the cost of your production, whether it be organic or GM, for the future because of the increasing loss of land area in which it can be grown. I'll stop there.</p>
MR:	Thank you very much. Do the panellists want to comment?
CB:	<p>I think it would be a shame to polarise the conversation around organic and conventional. It's actually a step back from that because the impact of growing cotton in the environment and the stewardship and the resources which are required to grow cotton. I think that's what I would like people to take away and think...because there are other ideas about farming systems, integrated farm management and the like which could also be looked at. It is slightly true though because of course Bt whilst it's integrated into the plant it's not [inaudible 0:11:00] organic, but you can spray the bacteria among plants in organic systems, in fact they are required to in some instances. And just...and I'm closest to the door, but whenever I have the privilege to come to an Oxbridge college it always [inaudible 0:11:12] have a great conversation about biodiversity and how awful farming is on biodiversity when I'm surrounded by acres and acres of mown lawns, and just hold the mirror up a little, there's usually someone going put-put-put on a lawnmower burning up fossil fuels while I'm in a room being castigated about my impacts on biodiversity. There are other uses of land which make their contribution to that.</p>
BW:	You haven't addressed the question about the trends though.
CB:	Oh cotton production is rising.

BW:	Rising?
CB:	Yeah. In the past 40 years we've gone from, I'm trying off the top of my head...we've gone from 400, sorry my numbers will be wrong, but it's basically doubled.
BW:	Because there is a geopolitical aspect to this as well, you mentioned Uzbekistan, Tajikistan and the Stans in general are now not able to feed themselves and reliant on Russian grain because they're producing cotton for the world and there's a sociopolitical dimension to this crop which... I think it's a miracle that cotton hasn't been at the next big foreign oil scandal and it will at some point happen I think.
CB:	Yeah, but you then would say what are people going to wear?
BW:	They don't need to wear cotton.
HC:	Well let's go back to basic principles because if we go back to basic principles what is it...? Can you...? A renewable resource is better than a non-renewable resource, that's a basic principle.
BW:	Really? A recyclable resource is better.
HC:	Okay. Well if you don't accept that basic principle then yes, then the argument is up for grabs. If you're saying that a non-renewable resource could be as good as a renewable resource then that's changing the principle, but if you go back...that's a different discussion. If you go back to cotton is a renewable resource, it's grown by smallholder producers that get a livelihood out of it, we could say let's improve that so they get a better livelihood and we get a better product or let's try and find some alternative. I would challenge you to find an alternative based on a non-renewable resource. I'm not talking recycling, I agree completely that we need to do closedloop recycling and there's great technologies coming down the road where we will be able to do closedloop recycling, but then that's also...for that to work there is an issue about collection and there's a sort of logistical issue that needs to be in place as well about collecting and recycling [inaudible 0:13:42].
BW:	Charity shops are doing it for you right now.
HC:	Yeah, but they're not. We're supporting eight million tonnes alone in the UK going to the landfill every year, so there's still an issue, but that's okay, we can solve that, that's logistics, that's fine, once we have the technology we'll solve that. So I think that by saying that maybe we shouldn't be wearing cotton maybe because that...maybe, but I would argue that if we want to keep...it's still a renewable resource that has a lot of value as a resource and it's more about the way we grow it and the way that we support the farmers to grow it. Now if the land becomes more valuable to produce something else that is more valuable to society then that might happen. And I agree, in Central Asia one could argue, like in Australia one could argue that the environment is probably not built for the production of that crop forever and a day, so maybe they should be going back to millet or something else, but that's a bigger issue. Meanwhile you have small-scale producers that need a livelihood.
MR:	Bhaskar, you're an economist.
BV:	I wanted to actually...this is a good point to step in, I wanted to bring the farmer, the producer back into the discussion. We've not talked a lot about the farmer and I was interested in one of your earlier responses, the premium doesn't actually roll back at the moment to the farmer, so you might be growing organic but the farmer is not necessarily getting rewarded in terms of the per hectare production. And a farmer is only growing cotton at the moment in the Stans or wherever else they are because they think that's the best use financially of their land, the farmer is rationally trying to choose between more alternative crop mixes and this kind of ties us into the larger agricultural commodity pricing system that we live within. There are subsidies elsewhere in the system which are reducing prices of certain commodities and other commodities are actually being treated on a more open market system. So the farmer is not necessarily confronting the true cost of the



	<p>production or making rational choices about what's the most optimal use of their land because the entire agricultural production system, of which cotton is only one small part, is hugely complicated by the ways in which trade flows in agriculture are distorted by subsidy policy. So we're not looking at anything that looks like a normal market and when the farmer is making a choice they are making a choice based on income instead being provided by a set of actors who are interacting with the farmer. We know the reaction that happened in the subcontinent case when a spate of farmer suicides were incorrectly associated with cotton production but people thought that that was the trigger and the cotton farmers were, you know... If you looked at the newspapers during those couple of years it was as though cotton farmers were killing themselves every day and it wasn't the truth but the moment that starts to propagate itself the farmer's choice about cotton becomes a toxic product, in the way that Bryony was talking about, that it's associated with death and one of the things that people will worry about, that production system compared to alternatives which might not require quite as much upfront cost and quite such a distance between the sort of actual harvest and the deferred payment that you might be getting from the spinners and ginners further down the line.</p>
	<p>So it's sort of trying to understand why there is an increase in cotton production over the last 40 years I'd say. Within the industry is there a sense that farmers want to continue to grow cotton or is there a real problem there and is that something that you're thinking about addressing? What are your alternatives to growing cotton and what might the farmer move...? Because for you as an industry that's your biggest risk, but we don't control the fields on which cotton is being grown, we have to continue to have farmers who are willing to plant cotton on their fields. So it's the biggest risk in that sense.</p>
CB:	<p>So to take that thought, the way I de-risk that within other areas is actually I do know the farmers' fields and there is a dimension to that which is at the moment whether it's an imperfect system but there is a level of aggregation and distribution of the monies, what will actually happen is people will take and look after their own supply chains and all of a sudden you will find that the supply chains which are most responsible and that are financially rewarding amongst its supply are the evil retailers that [inaudible 0:18:11] the problem. Actually there's a whole pile of other folks who are riding on our coattails and people will find actually you don't know the market you are supplying into and there will be a further separation and that I can easily see. It's already happening in palm oil [inaudible 0:18:28], the people who have got proper supply chains and relationships and are being looked after, those in the rest of it will go onto a diminished global market because the sub high-value markets are now no longer available to them.</p>
BV:	<p>But I mean just given the complications of traceability Helen that you talked about, actually knowing your farmers seems quite complex in this current supply chain. Once that product is getting mixed up it sounded like traceability is quite problematic, therefore you don't really know your farmer that well.</p>
HC:	<p>Yeah, but I think that's logistics and solvable. I absolutely agree with Chris, I think there...and I think that's what the EP&L has done has helped us to understand our supply chain and open it up and now we're working on...not just on cotton, cotton is actually relatively easy compared to other commodities that I'm working on because there is a certification system that goes through the whole supply chain [inaudible 0:19:20] that you can actually use to help trace. So I think getting to know your farmer, where it's coming from and build that traceability in the supply chain is actually doable and I think that's happening and I think there are a lot...C&A's a great example, there are a lot of great companies out there in the cotton supply chains that know exactly where their cotton is coming from and building that traceability into this supply chain.</p>
	<p>Just one point on the farmer suicides, it's interesting because I just read Bloomberg and they were talking about the suicide...now the cotton price has dropped the suicide rate has gone up again and they linked it back to cotton and the whole system in Northern India. I was generalising when I said...it's not that every organic farmer doesn't get some...there</p>

	<p>are some really nice supply chains that are working, particularly in India, where there is reward for organic production and Turkey also actually, there's some good systems. But it's not happening enough across the production, so it's not incentivising conversion to organic and it's not helping keep in certain areas some organic farmers in organic and it's a question of timing of payment as well as loans and debt.</p>
	<p>I just wanted to refer to the genetic modification issue. When I started one of the things I said is that...there's a whole discussion to have around whether transgenic genetic modification is appropriate in certain areas. That is a different and like you bet a very clear case that in Australia it is. Because I don't want to polarise the debate, I just wanted to say that if you are looking at natural capital and what is the best opportunity for natural capital, the best production system, I say as it stands at the moment organic production is the best for natural capital. If you're looking for other things, like how do you grow cotton in Australia where it shouldn't probably have been grown and how do you make that work given the climatic and conditions, then that issue about genetic modification, that's a whole different discussion. To me that's a different discussion and so I agree, we shouldn't polarise it. I think the way genetic modification is the way those seeds are owned by seed companies and the way that is translated into reality in areas like in India particularly, it is challenging. But that's more of a business model issue too. So I agree that we shouldn't polarise it and there's lots of [inaudible 0:22:01], all I'm saying is that if you care about natural capital then organic is a really great system, but I acknowledge that the world is way more complex than to say...</p>
MR:	Briefly and then Sue.
IH:	<p>Well the first thing is the argument about seed and so on is...you know, there is a problem there and there has been with some of the multinationals but it really isn't any different from growing F2 hybrids, whereby you create a natural hybrid which has hybrid vigour, therefore you have to have the seed from the manufacturing every year. So that's the first one. The second one is have you really asked your farmers about this natural capital because actually often it was the case with maize in Mexico, the reason that the farmers of maize transgenics were found in the uplands of Mexico wasn't because the pollen had spread there artificially, the farmers wanted those new varieties with higher production, so perhaps... You know, they want to maximise their income and so on, so sometimes you have to consider that.</p>
HC:	For sure, absolutely.
SO:	<p>Well I just have three quick points really. We haven't really talked about what you might call the secret life of a cotton T-shirt, how does it go through the system and why do people get rid of a cotton T-shirt? Is it because it falls apart or is it because it's not cool to wear that kind of T-shirt anymore? I think that would be quite interesting to look at. Secondly I would be sorry if we went away with the idea that talking about the natural capital and pricing and so on was a methodological issue, it's not, at a fundamental level it's an ethical question and it's a question of which basic ethical theory you want to use in relation to measuring natural capital. There are big methodological issues but we can also be much more accurately wrong and I think it's not just that question. Thirdly, I mean I'm always...because this interests me academically, but it's absolutely fascinating to hear people saying that we should be more technical or practical about issues like GM or organic versus other kinds of things, but then speaking with such passion that clearly it's ideological, it's obviously ideological. The nature of the disagreement is ideological to do with different worldviews and it's not resolved by recourse to the science or practicalities or any of those things, it has to be tackled at the root level of those disagreements.</p>
KM:	<p>It was just a really tiny comment to both of you actually. If you define that you want an organic crop and many people do want it and I've nothing against organic production, but you're then saying to your farmer you have to take on a lot of risk because you've reduced his options, so if you won't have GM you don't have, let's say, bacterial tolerance or</p>



	whatever, or if you go for conventional then you can use chemicals. So if you're saying to a farmer I want organic which means you've got a reduced number of options and then the potential is that you're going to have a catastrophic crop failure now and again. So are you as buyers prepared to enter into a relationship with farmers taking on that risk to help them out through the bad times?
MR:	Could I ask any final further questions and then we give the last word to the panellists.
BV:	I had a thought after that question which is also if you're making the transition from conventional to organic there's all sorts of upfront conversion time, so you can't convert overnight. So there's a sort of...if you're asking farmers who are in commercial farming systems to stick on an organic [inaudible 0:26:12] there is a sort of transition period when they're not going to be able to produce either the commercial or the organic.
HC:	Can I just say, I'm not really asking farmers to do anything, I'm trying to support them in the choices that they make. So if that farmer wants to make...you made the good point that a farmer will make a decision based on his environment and his knowledge and so if a farmer decides, because he has the availability of the training and the support and whatever that he would like to go to organic then he gets...theoretically he gets rewarded, even during the conversion time with the price premium, and that's what he decides. That's how the theory of...
BW:	Price premium is not going to work if you've got a catastrophic failure.
HC:	Exactly. So there's a lot of discussion in the organic cotton world about how do you de-risk things for producers because they might make the choice here and now, 'I want to do, because I want to have my seed, I want to grow it like this, I want to do the rotational crops, I want to get the price premium, I would like to do this and so I would like to do that.' So how do you support a farmer that makes that choice and we can support it as a company by saying 'We'll buy it and we'll buy it at the premium.' But there's also roles of other players in the supply chain that come in and help support to de-risk that, whether that's through some sort of insurance schemes or some sort of extension services or something else. There is certainly...it's not just like it's going to happen, organic, and they're going to live happily ever after, I agree completely. So there needs to be a system in place that helps those farmers like with any other production system and I think there's a lot of discussion as we were talking about, like obviously [inaudible 0:28:01] how can you get those investors and those sustainable development donors to get involved in de-risking this, if we decide that's something important for the world, organic cotton production.
MR:	Chris, this is last word or benediction from you.
CB:	Just say that if you look organic milk in the UK it's actually run by a cooperative and you apply to convert because until they have a market for it they won't let you, or they won't market it on your behalf, but I think these are just supply and demand mechanics.
END OF AUDIO	

