TITLE: Sustainable Intensification Briefing Note for Participants

DATE: 01/02/2016

NB: The same briefing note was used in advance of the telephone interviews, online survey and workshop to ensure all participants had been provided with the same basic information about the topic.

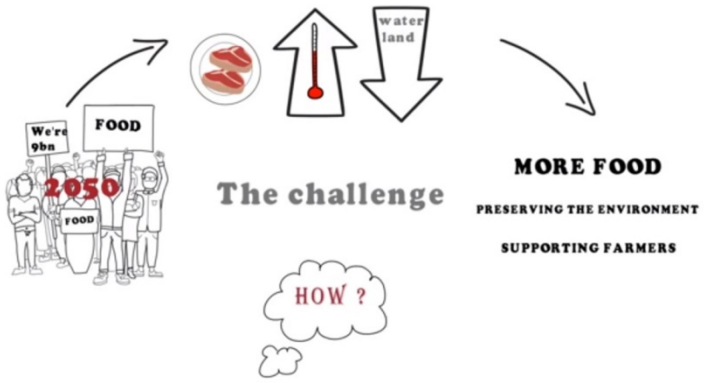

Figure 1 - screenshot from introductory video

Video:

As well as providing a text copy of the briefing note we produced a simple video which read out the same text, accompanied by animations. You can watch the video version via the following link:

https://www.youtube.com/watch?v=IsAIPJPtTZw

Text version:

The challenge

Food security is one of this century's most important global challenges. By 2050 – given current trends - the world will need to produce significantly more food in order to feed its predicted 9 billion people. At the same time diets are changing around the world, climate change is altering the environment in which food is produced, and land and water are becoming more scarce. The challenge is for the food system to produce more food whilst sustaining the environment, preserving natural resources and biodiversity and supporting the livelihoods of farmers and rural populations around the world.

Potential solutions

There are many potential solutions to the challenge of food security, and most food researchers agree that no one solution will be sufficient. We can think of the possible solutions in terms of three themes:

Managing demand

At the moment, the world produces enough food to feed the current population. But as many as a billion people are chronically hungry at the same time as a billion people are over nourished and millions are suffering health problems related to obesity. Managing demand means changing the type and amount of food that is required to feed the population.

- For example we know that producing a certain amount of calories from meat takes more resources than producing the same amount of calories from food crops. So reducing demand for animal products could lead to a more efficient food system in some ways.

Making better use of current food production

Not all of the food that is currently produced ends up being eaten, either because it is wasted before it can be eaten, or because it does not reach the people who need it.

- For example a large proportion of food is wasted in the food chain because poor storage means it is spoiled. Improving the way in which food is stored and distributed could reduce waste.

Increasing food production

If demand continues as it is we will need to produce more food in the future. But some methods of food production can have negative impacts on the environment, which in turn reduces the capacity of the planet to produce food. Increasing food production needs to take these impacts into account and be done in ways which are sustainable. Increasing food production could involve:

- Finding more space for food production, for example through converting forests to agriculture. However, this comes at significant environmental costs. Other ways of using "new space" such as urban agriculture, are unlikely to produce enough. Thus, as a first approximation, if we are to grow significantly more food it should be on the land we already use.
- Changing the way in which food is produced to increase the amount of food that can be produced with the same inputs (land, fertiliser, energy) without harming the environment. This is referred to as sustainable intensification and is the topic for this project.

What is sustainable intensification?

Sustainable intensification is a difficult approach to define and specialists are still debating exactly what it means. One definition used recently is : sustainably increasing the production of food, combined with improved resource use efficiency and better environmental outcomes.

There are different ways in which production can be increased:

- **Changing the crops we grow:** One way to increase food production is to choose crop varieties which are more efficient. For example a crop whose roots absorb water more efficiently could increase the amount of food produced in the same field without requiring more water.
- **Changing the way we farm:** Another approach is to change farming practices to use resources more efficiently. For example targeting fertiliser inputs in each small area of land rather than putting the same amount on across the field. This "precision agriculture" would reduce air and water pollution.
- **Changing land use:** Another way of sustainably intensifying food production is to change where it is grown. For example we could grow more intensively where the land is most suitable and leave land to nature so that it benefits biodiversity where it is less suited to crop growing. This

"smart land use" could apply within a farm or landscape (where should land be left for nature?) or at the country level.

What are the challenges for sustainable intensification?

Sustainable intensification might sound like a perfect solution to feeding the world and protecting the environment but in practice there are important decisions to make. While some people see sustainable intensification as a way to reduce hunger, others question whether it is just a label given to the same old intensive farming, or suggest that it will distract governments and others from problems like food waste and changing diets.

There are also questions about what impacts sustainable intensification might have around the world. The impact may be different in countries like the UK where much of our agriculture is already quite intensive, and in other countries where some of the approaches we use are not as common. For example:

- **Changing the crops we grow**: Sustainable intensification might mean changes to the type of food produced in an area to use crops that have lower impacts. In the UK we might not notice changes to what's sold in our supermarket because much of our food is imported from other countries. But in an area where people have less access to imported food it could affect their everyday diet.
- **Changing the way we farm (a):** A farmer could improve the yield of their crops by changing the way they manage water on an individual farm. This could affect the amount of water running through the public drainage system, or into rivers. If the farmer uses more water this could mean less water for use elsewhere, if they increase drainage it could increase the risk of flooding by speeding up river flow.
- **Changing the way we farm (b):** if a farmer is intensifying to grow more food on their farm, they might need to use more inputs, even if they are increasing efficiency. These inputs could be fertilisers – which can pollute rivers – or pesticides which can affect beneficial insects like bees or butterflies, as well as the birds that feed on them.
- **Changing land use:** If the UK took the approach of concentrating food production in the most suitable land areas this could have a significant effect on those areas of the countryside. Areas that are intensifying could have larger farms and fields, and larger herds of cows. This would have implications both for the appearance of the countryside, and the local economy.

Another challenge for sustainable intensification is to decide what counts as "sustainable". It's easy to think of sustainability as reducing environmental impacts like pollution but when researchers talk about sustainability they are often referring to a much broader picture. Sustainability can include social and economic impacts, like the farming economy, human health impacts, and how well an agricultural system can stand up to shocks like extreme weather or price hikes, as well as whether we are leaving the world in a good state for future generations. When sustainability encompasses all of these aspects it's difficult to find approaches to food production that works well for all of them. That's where we get trade-offs between the different aspects. Some examples of **trade-offs** are:

- Increasing productivity of livestock farming has often involved more animals in a smaller area. This may reduce the environmental impact (for example by using less land), but reduce animal welfare by housing animals in more cramped conditions. How do we balance the environmental impact with the ethical concern?
- A farmer may be able to grow a high value food crop which guarantees them a good income, and has nutritional benefits for consumers, but requires so much water to grow well that local water sources are depleted. How do we balance the social benefits (health and economy) with the environment?

Why are we asking the panel about sustainable intensification?

The Global Food Security programme, who fund this panel, help influence what public sector research is carried out in the UK, including what types of sustainable intensification should be the main areas of focus. They want to understand your views on this topic to help them set a long term strategy for this research, and that's what we'll be exploring in this project.

TITLE: Sustainable Intensification Depth Interview Discussion Guide

DATE: 01/02/2016 – 19/02/2016

All interviews used the same discussion guide, which followed the same approximate structure as the briefing note. Not all questions were covered in each 30 minute interview, and interviewers were instructed to be responsive to participants, following up on areas where participants were particularly responsive.

Research are	**Prompt questions**
n/a	Thanks for taking part. First we'd like to know whether you had heard of sustainable intensification before we invited you to take part in this interview? If yes, in what context did you come across it? , What did it make you think of? What did you understand it to mean? What associations did it bring to mind? If you first encountered sustainable intensification in the briefing note, what are your first impressions? What does it make you think of? Positive/negative? Associations?
Views on SI as an approach to agriculture	Thinking about the briefing note, what do you think of the food security challenge? Have your views about the importance of food security changed since joining the panel? What do you think of the three approaches to addressing the food security challenge that were described in the briefing note? (Reducing demand, making the most of what we have, producing more food). Which do you think should be the biggest priority? Why? In this country? Why is it particularly suited to the UK? Individually in other countries around the world? A global approach? Which of the approaches do you think is already being used? Here in the UK? Elsewhere in the world? Which, if any, of the approaches do you support in particular? Which, if any, of the approaches do you oppose in particular? If not discussed already prompt participants on cited challenges. How do you think farmers would respond in each situation? Which approach do you think is most important in addressing food security?
Trade-offs associated with SI	The briefing note set out some potential trade-offs or challenges for sustainable intensification. The first example was about animal welfare and productivity: what are your views on this trade-off? • *Increasing productivity of livestock farming has often involved more animals in a smaller area. This may reduce the environmental impact (for example by using less land), but reduce animal welfare by housing animals in more cramped conditions. How do we balance the environmental impact with the ethical concern? (Quote from briefing)* The second example was about the potential conflict between economic and environmental benefits. What are your views on this trade off? • *A farmer may be able to grow a high value food crop which guarantees them a good income, and has nutritional benefits for consumers, but requires so much water to grow well that local water sources are depleted. How do we balance the social benefits (health and economy) with the environment? (Quote from briefing)* How much do you think about the environmental, social and economic impacts of your food? Do you think people should consider these impacts?
Actors and influence on SI	One question asked about sustainable intensification is who is responsible for implementing it and who might benefit. Some organisations like Greenpeace think that it is a term mostly used by big business to describe their existing intensive farming

	practices and not about real changes that benefit farmers. But agricultural businesses like Monsanto argue that by introducing new technology they are enabling farmers to make a better living. This is just one example, and there are many approaches to SI. Who do you think has responsibility for making sure that food production is sustainable? What about ensuring that enough food is produced globally? Is it the role of the individual farmer to manage their own land in the right way to grow as much food as possible, or to reduce environmental impacts, or to make the best living possible? What about the companies who purchase their food or the companies that supply seeds and tools? What about governments?
Consumer choice and SI	Reflecting on some of the trade-offs we've discussed, how would you tell whether the food you choose is produced in a way that you are happy with? Are there any criteria which you would want to be sure were met? How do you know if food is produced, ethically, environmentally sustainable, economically? Are there specific examples you can think of where you know how something is produced? Do you think consumers have a role in changing the way food is produced through their choices? How much influence do you think you have? What could give you more influence? What would influence you to change your behaviour?

TITLE: Sustainable Intensification Face to Face Discussion Group – Process plan

DATE: 01/03/2016

This part of the project involves two 90 minutes discussions between specialists and panel members, one each our London offices (1st March) and an online session using the online chat function on the Food Futures platform (3rd March).

This document sets out each stage of the workshop and forms a discussion guide for facilitators. The questions included in the guide are not used verbatim by facilitators but provide a loose structure for them to follow, whilst also allowing them to respond to and incorporate participants' views as the discussion continues. Facilitators are briefed on the overall objective of the discussion and what each question is seeking to elicit, which enables them to tailor the questions they do ask appropriately. We will aim to be responsive to the points participants make, and to keep the discussion flowing as naturally as possible.

Process plan: face to face event

Timing	Activity / questions	Facilitator notes
18.00 – 18.30	Specialists and participants arrive.	Reminder to specialists about their role Sandwiches available Participants allocated to tables
18.30 – 18.45	**Introductions** • Lead facilitator introduces the format, aims, ground rules and participants • Reminder of concept of sustainable intensification (as per briefing note) and highlights from survey • Short table discussion session: what struck you from the survey? o Aim here is to encourage participants to reflect on the survey and build on it rather than to go over the same ground o Prompt questions: o What did you agree with? Is there anything that	Slides with intro Identify who's in the room Slides with definition and highlights from survey (handouts on tables for participants to refer to) TURN ON RECORDERS Specialists at tables at this point, facilitators to guide discussion

Timing	Activity / questions	Facilitator notes
	was new/surprising in the questions? Do you agree with the responses?	
18.45 – 19.00	**Specialist introductions**: **how can SI contribute to global food security?** • 3 minutes each to present the main opportunities and challenges they see for sustainable intensification	Back to plenary Encourage participants to make notes on post-its to discuss in next session
19.00 – 19.05	**Table discussions: how can SI contribute to global food security?** What questions do you have for specialists, what are your first impressions of sustainable intensification as an approach to global food security? In the UK? In other countries?	TURN ON RECORDERS Facilitators – collate questions from post-its, prompt participants for more questions
19.05 – 19.20	**Panel session: how can SI contribute to global food security?** Addressing questions from participants	Back in plenary, lead facilitator to chair LF will encourage debate between participants, not just back and forth with specialists

19.20 – 19.50	**Table discussions: how could SI be developed?**
	What would need to change for SI to happen in the UK? What would be the effects? How should the UK negotiate the trade-offs?
	• Two sets of stimulus/prompt materials
	  ○ Actors in the food system, what do they need to do? What is the role of consumers? Are you able to make choices as a consumer that can have an impact?
	  ○ Trade-off cards showing possible trade-offs (e.g. environmental vs ethical, landscape vs productivity as per survey)
	• Aim is to stay with the theme of trade-offs but move to a discussion of the possibilities for the UK, of implementing SI, the roles of different actors, how
		TURN ON RECORDERS
		Facilitators to guide, specialists at tables

Timing	Activity / questions	Facilitator notes
	benefits could accrue.	
19.50 – 20.00	**Thanks and close**: Lead facilitator to wrap up, evaluation forms and incentives	Evaluation forms for all

TITLE: Sustainable Intensification Online Discussion Group – Process plan

DATE: 03/03/2016

This part of the project involves two 90 minutes discussions between specialists and panel members, one each our London offices (1st March) and an online session using the online chat function on the Food Futures platform (3rd March).

This document sets out each stage of the workshop and forms a discussion guide for facilitators. The questions included in the guide are not used verbatim by facilitators but provide a loose structure for them to follow, whilst also allowing them to respond to and incorporate participants' views as the discussion continues. Facilitators are briefed on the overall objective of the discussion and what each question is seeking to elicit, which enables them to tailor the questions they do ask appropriately. We will aim to be responsive to the points participants make, and to keep the discussion flowing as naturally as possible.

Process plan: online event

Timing	Activity / questions	Facilitator notes
18.00 – 18.30	Specialists and participants login.	Calls with specialists in advance to ensure they can access chat Facilitators logged in to welcome participants
18.30 – 18.45	**Introductions** • Lead facilitator introduces the format, aims, ground rules and participants • Reminder of concept of sustainable intensification (as per briefing note) and highlights from survey • Short discussion session: what struck you from the survey? o Aim here is to encourage participants to reflect on the survey and build on it rather than to go over the same ground o Prompt questions: o What did you agree with? Is there anything that	Facilitator has pre-prepared intro Video clip with intro and survey highlights in side bar Specialists involved at this point, facilitators to guide discussion with prompt questions

Timing	Activity / questions	Facilitator notes
	was new/surprising in the questions? Do you agree with the responses?	
18.45 – 19.00	**Specialist introductions**: **how can SI contribute to global food security?** • 3 minutes each to present the main opportunities and challenges they see for sustainable intensification	Facilitator signals move to next part of discussion Each specialist has text prepared, present it one at a time Encourage participants to think about questions
19.00 – 19.05	**Question gathering: how can SI contribute to global food security?** What questions do you have for specialists, what are your first impressions of sustainable intensification as an approach to global food security? In the UK? In other countries?	Facilitators – ask participants to submit their questions within the ten-minute time limit. Facilitator will collate and put to specialists one at a time.
19.05 – 19.20	**Panel session: how can SI contribute to global food security?** Addressing questions from participants	Facilitator will present back questions one at a time and direct to particular specialists LF will encourage debate between participants, not just back and forth with specialists

19.20 – 19.50	**Table discussions: how could SI be developed?**
	What would need to change for SI to happen in the UK? What would be the effects? How should the UK negotiate the trade-offs?
	• Two sets of stimulus/prompt materials
	  ○ Actors in the food system, what do they need to do? What is the role of consumers? Are you able to make choices as a consumer that can have an impact?
	  ○ Trade-off cards showing possible trade-offs (e.g. environmental vs ethical, landscape vs productivity as per survey)
	• Aim is to stay with the theme of trade-offs but move to a discussion of the possibilities for
		Facilitator signals move to next part of discussion
		Facilitators to guide discussion which includes specialists
		Prompt materials in the side bar for participants to click on

Timing	Activity / questions	Facilitator notes
	the UK, of implementing SI, the roles of different actors, how benefits could accrue.	
19.50 – 20.00	**Thanks and close**: Lead facilitator to wrap up, evaluation forms and incentives	Lead facilitator to close and thank – evaluation by email and incentives as points.

TITLE: Sustainable Intensification Survey Questionnaire

DATE: 18/02/2016

The survey was hosted online and all quantitative questions were compulsory.

	Question	Response format
Q1	Had you heard of sustainable intensification before taking part in this questionnaire?	Y/N
Q2a	• If yes: can you tell us where you heard about sustainable intensification and what you understand it to mean?	Open text
Q2b	• If no: reflecting on the briefing, what are your first impressions of sustainable intensification?	Open text
Q3	Global Food Security occurs when everyone has access to safe, affordable and nutritious food, all of the time and in ways the planet can sustain into the future. How much of an issue do you think food security is in the world today?	A big issue, Quite a big issue, Not that much of an issue, Not an issue at all
Q4	How much of an issue do you think food security is in the UK today?	A big issue, Quite a big issue, Not that much of an issue, Not an issue at all
Q5	Sustainable intensification is one approach to address global food security, by increasing the amount of food produced. Which of these three approaches do you think should be the biggest priority **in the UK**? • **Changing diets**: some foods are more resource intensive, like meat, by consuming differently we could increase the food directly available for human consumption. • **Reducing waste**: among consumers and throughout the supply chain we could feed more people with the food we currently produce. • **Increasing production**: we could change the way we produce food to increase production.	Select ONE of three.
Q6	Why do you think this should be the biggest priority?	Open text
Q7	And which of the three do you think should be the biggest priority in the **world**? • **Changing diets**: some foods are more resource intensive, like meat, by consuming differently we could increase the food directly available for human consumption.	Select ONE of three.

	• **Reducing waste**: among consumers and through the supply chain we could feed more people with the food we currently produce. • **Increasing production**: we could change the way we produce food to increase production.	
Q8	Why do you think this should be the biggest priority?	Open text
Q9	Sustainable intensification aims to produce more while reducing environmental impacts. However, sometimes there will be a choice to make about whether or not to increase production depending on the impacts. The following questions give examples of some of these potential trade-offs. Which of these factors do you think is **most** important in food production?	Rank from one to four
Q9a	• Producing food more sustainably, in ways that protect the climate, biodiversity and other resources	
Q9b	• Producing food in ways that support the economy and farmers	
Q9c	• Producing and distributing food in ways that are equitable for all involved	
Q9d	• Plentiful and affordable food supply for the UK consumer	
Q10	**Changing the crops we grow part 1**. Consumers in the UK can buy most foods all year round. One way of reducing the resources used for the crops we grow and consume is to more closely fit supply and demand with the conditions i.e. growing the crops when the conditions are right. For example, this might mean growing summer fruits for only a few months a year. In some other countries this could mean choosing a crop that better suits the environment, for example switching from water intensive crops like rice to drought resistant crops like millet that are currently less popular. • What do you think of this approach to increasing production? Would you be prepared to change your diet to eat food that is more efficient to produce? Why?	
Q11	**Changing the crops we grow part 1**. One way of producing food with lower impact is to change the varieties of crops we grow for those that require less resources like water or fertiliser. In the UK this could be scientific development of new varieties and breeding techniques to improve genetic traits to increase productivity. • What do you think of this approach to increasing production? Should we use scientifically developed crop varieties to increase production without changing diets? Why?	Open text
Q12	**Changing the way we farm.** Producing livestock like cows and	Open text

	chickens for food can be less efficient in converting resources into calories than producing vegetables and crops, particularly when animals are fed on grain, which could be used to feed humans. If livestock are being produced for human consumption, it can be more efficient to farm large numbers of animals in a smaller area. However, this can result in lower animal welfare standards. • What do you think of this approach to increasing production? Should we accept lower animal welfare standards in order to reduce the environmental impacts? Why?	
Q14	**Changing land use.** One example of areas in the UK that do not produce much food are uplands – areas like the Lake District, Welsh mountains or Northern Irish hills. These areas are often valued for their appearance, and they often have low levels of sheep farming because they are not well suited to growing crops. If we wanted to increase the amount of food produced in the UK we may be able to farm these areas more intensively, but this would change their appearance, and could have negative environmental impacts. • What do you think of this approach to increasing production? Should we use more land, even if it has more impacts? Why?	Open text
Q15	**Changing land use.** In contrast to the example of uplands, we could focus production in areas that are most suited to agriculture. This could mean more intensive farms (perhaps much larger farms, with fewer hedgerows) in some areas, so that other areas can be left to nature. Another possible consequence would be for water: more water might be used for agriculture, and intensive crops could increase the risk of flooding nearby. Within the intensively farmed areas there could be more pesticide and fertiliser use, with fewer birds, bees and butterflies. • What do you think of this approach to increasing production? Should we use some land more intensively so other land can be preserved, even if it has negative impacts on the areas being farmed? Why?	Open text
Q13	**Changing the way we farm.** Precision agriculture is one way of increasing production while using less of inputs like fertilisers. Farmers use technology like satellite monitoring to identify exactly where fertilisers are needed. One of the barriers to this approach is the cost of new technology for farmers, and there can be big differences in efficiency between the most and least advanced farms. • What do you think of this approach to increasing production? Should farmers use new technology to increase efficiency? Why?	Open text
Q16	Thinking about all the examples you've read today, which of	Rank from one to four

	these factors do you think is **most** important in food production?	
Q16a	• Producing food more sustainably, in ways that protect the climate, biodiversity and other resources	
Q16b	• Producing food in ways that support the economy and farmers	
Q16c	• Producing and distributing food in ways that are equitable for all involved	
Q16d	• Plentiful and affordable food supply for the UK consumer	
Q17	Has your view changed, and if so why?	Open text