

Wheat crisis hits humans and animals

004

FP7 themes	health	agro	ict	nano	energy	environment	transport	ssh	space	security
ERA goals	mobility	infrastructures	rtd institutions	knowledge sharing	joint programming	cooperation				

Blue Sky Policy Brief 004
02.2010

Author(s)	Yanuar NUGROHO (University of Manchester), David CAIN (Regional Technology Centre North), Rafael POPPER, Joe RAVETZ, Thordis SVEINSDOTTIR (University of Manchester)																			
Contributor(s)	Peter ELLWOOD (Health and Safety Laboratory), Fiona LICKORISH (DEFRA), John REYNOLDS (SAMI consulting), John TURNPENNY (University of East Anglia) and Martin FATUN (Technology Centre)																			
UK workshop participants in the ENVIRO-SSH group																				
Manifestation	Gradual development	<table border="1"> <thead> <tr> <th colspan="2">Potential impacts in Europe</th> </tr> </thead> <tbody> <tr> <td>infrastructures</td> <td>★☆☆☆☆</td> </tr> <tr> <td>people's lives</td> <td>★★★★★</td> </tr> <tr> <td>legislation & regulation</td> <td>★★★☆☆</td> </tr> <tr> <td>economy & business</td> <td>★★★★★</td> </tr> <tr> <td>defence & security</td> <td>★★★★★</td> </tr> <tr> <td>government & politics</td> <td>★★★☆☆</td> </tr> <tr> <td>environment & ecosystems</td> <td>★★★☆☆</td> </tr> <tr> <td>science & technology</td> <td>★★★★★</td> </tr> </tbody> </table>	Potential impacts in Europe		infrastructures	★☆☆☆☆	people's lives	★★★★★	legislation & regulation	★★★☆☆	economy & business	★★★★★	defence & security	★★★★★	government & politics	★★★☆☆	environment & ecosystems	★★★☆☆	science & technology	★★★★★
Potential impacts in Europe																				
infrastructures	★☆☆☆☆																			
people's lives	★★★★★																			
legislation & regulation	★★★☆☆																			
economy & business	★★★★★																			
defence & security	★★★★★																			
government & politics	★★★☆☆																			
environment & ecosystems	★★★☆☆																			
science & technology	★★★★★																			
Importance for EU	★★★★★																			
Strategic attention	by 2030★★★★★ by 2050★★★★★																			
Type of impact	Very negative																			
Inspired by	Brainstorming session and group discussions in the iKNOW Workshop in Manchester (February 2010)																			
Key words	Food, crops, disease, wheat, mono-culture, consumption, humans, animals																			
<p>Negligible ★ Minor ★★ Moderate ★★★ Major ★★★★ Critical ★★★★★</p>																				

Wild card

This wild card (also called “wheat comes a cropper”) concerns the emergence of a new pest or disease which specifically targets wheat and wipes out the whole wheat crop. This leads to a severe worldwide shortage of a staple food for humans and animals. Because of the genetic mutation, emerges a new pest or disease that targets and destroys all wheat crop and this spreads quickly across the globe. The impact is severe as the worldwide food supply for humans and animals are in serious shortage. This happens as human (and animals alike) becomes overly dependent on one particular source of main food. Large farms with mono-culture crops dominate massive farming areas, which are, while producing lots of food, also creating alarming risks to humanity and the environment. This situation is created by market push which always seeks for cheapest sources of food but unintentionally creates a highly vulnerable system easy to break down. In addition standardisation in food and farming industry makes the whole system vulnerable.

Surprises (‘wild’ scenario features)

What make this a wild card? In general, over-reliance of human and animals alike on only a few species makes human life much more vulnerable. Any disruption that affects these species would create massive impact to humans and animals. While we have bigger farms around, actually what we also have is fewer suppliers in terms of variety/variance. This increases the risk as we rely more on less variance of foods. Another feature that makes this wild card feral is that with genetic engineering, advanced new pest/disease easily develops whose progress might escape our observation. As we only have mono-culture, we have no crop resistance when the disease spreads: the impact will be devastating. This situation will become worse when we only have smaller gene pool to breed new crops as we will not be ready if the wild card manifests.



Blue Sky Policy Brief 004 – Wheat crisis hits humans and animals

Possible interpretations

There are a number of possible conditions under which this event becomes wild. Firstly, that we now are living in a time-and-space in which we cannot completely eliminate risk. In other words, inherently, we live in a 'risk society' (as once coined by Ulrich Beck). In such society what constitute risk are not only natural risks (like natural disaster: flood, earthquakes, tsunami, etc.) but also what Giddens terms as 'manufactured' risks (i.e. human-made or human-induced catastrophe like computer virus attack, nuclear reactor leakage, etc.). Secondly, in light of that, we now actually rely on too few food sources to feed the population. These sources are human-made/genetically modified/enhanced mono-culture crops. Disruptions to these sources will consequently have massive impact on the survival of human beings. In addition, we do not really have monitoring programmes for disease development.



Key actors

Key actors related to this wild card, include:

- **Scanners** or "early warners" such as researchers who monitors the spreading of crop diseases; scientists who should start thinking of diversifying food resources rather than attempting to create mono-culture, high-yield crops for the sake of food industrial efficiency and productivity.
- **Shapers** (i.e. enablers/inhibitors): governments who should provide not only with regulatory framework on crops production but also encouragement through incentives for farmers and food industry for more diversification.
- **Stakeholders** positively or negatively impacted: farmers will be impacted since they are the central actor in the food supply-chain and play a critical part in providing food for humans and animals; consumers and the general public will suffer from the lack of food supply and from the massive social unrest if this wild card manifests. In this situation, the police are to deal with the societal impact, especially when food supplies run out and public restlessness (and probably riot) take place.

Potential impacts

What could possibly be the impacts of this wild card? It is envisaged that the impact would be massively affecting the society, for example: (1) massive civil unrest because of massive disruption of markets for food/feedstuffs; (2) high food prices due to this wild card, which will create trade barriers to protect individual countries' interest; (3) starvation, especially in the west thus forcing western countries to rely on others for food; and (4) massive needs to move to other staple crops – whose prices rise. These impacts will force people to rethink about genetically-modified (GM) crops, from GM as the cause of this massive disaster, to GM as possible solution for survival. It is also worth-noting that, at many fronts, it is the developing countries that have to bear the brunt.

Potential actions

What actions need to be taken before and after the wild card? This very much lies on the very idea of having a more reliable system which does not have to rely too much on mono-culture food crops. One possible potential action is building public awareness to grow their own foods. At a more massive level, policy should encourage farms to diversify crops they produce. Another

Recommended research

Thematic area(s)

Agriculture, environment, social sciences and humanities, and security.

Research topic

From farmer to consumer: Diversifying crop production and consumption.

Overreliance on a few core crops (e.g. wheat) makes food production and consumption vulnerable to any type of disruption. Were a new wheat disease to develop it could have severe implications for food markets worldwide, which could have unforeseen consequences such as starvation, civil unrest and high food prices. There is a need to prepare for diversifying food production and consumption in order to avoid such consequences. Farmers need to be assisted in order to better diversify their crops and consumers should be made aware of a greater variety of food products.

Objective

Research could focus on examining both food production and consumption patterns and current methods that are being used to influence both sides. Research could focus on ways to reach consumers and influence them to diversify their food consumption in order to move away from overreliance on a few core products (e.g. wheat). Research which focuses on food production could examine current food production trends in order to inform successful ways of diversifying crops. Research could also focus on food regulation, legislation and policy in order to identify what can be done to ease the transition to diversifying crops.

Expected impact

Research should aim to a) examine current food production and consumption patterns; b) inform practices that aim to diversify crop production and consumption; c) inform any policy response, regulatory and legislative initiatives that could encourage crop diversification.

Importance for Europe

Food security is an important grand challenge for Europe and threat to core crops could potentially have serious implications. It is vital that research underpins any policy preparation from the EU. Joint regulation is also necessary and the EU needs to take initiatives to formulate a response in the event of threats to food security. EU policy could then provide blueprints for any policy response from the governments of member states.



iKNOW is a Blue Sky foresight and horizon scanning research and technology development (RTD) initiative aimed to advance knowledge and tools for the early identification and analysis of events and developments potentially shaping and shaking the future of science, technology and innovation (STI). **iKNOW** is run by an international consortium lead by the University of Manchester and sponsored by the European Commission Directorate General for Research. By supporting Blue Sky RTD the EC aims to create more proactive European research policies that will be capable of anticipating challenges and opportunities associated to emerging issues, wild cards and weak signals (WI-WE). **Wild Cards** are situations/events with perceived low probability of occurrence but potentially high impact if they were to occur. **Weak Signals** are unclear observables warning us about the probability of future events (including Wild Cards). They implore us to consider alternative interpretations of an issue's evolution to gauge its potential impact.