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## Nourish Scotland's response to the Scottish Government's consultation on the **Scottish Climate Change Adaptation Programme**

Nourish Scotland welcomes the opportunity to respond to the Scottish Government's consultation on the Climate Change Adaptation Programme.

Nourish Scotland's particular focus is on improving the sustainability, equity and resilience of the food system in Scotland.

**The current adaptation plan fails to consider food - the issue which is likely to impact most severely on most people in Scotland as a result of climate change (and this impact will be felt most by the poorest in society). Creating a resilient food system must be at the centre of our adaptation plan.**

### **Food and climate change**

The global food system accounts for 20-30% of greenhouse gas emissions (through agricultural production, fertilizer manufacture, refrigeration, transport, deforestation, land use change, etc.). Climate change in turn is already making food production more challenging in many parts of the world as a result of extreme weather events (floods, droughts, heat waves) on top of a background of rising temperature and less predictable seasons.

It is impossible to predict with any certainty how climate change over the next 20-30 years will affect production. Locally in Scotland, while we may on average see longer growing seasons as a result of climate change, we have experienced several weather extremes just in the last four years. These have had a significant impact on yields, soil erosion, soil compaction, and farm business viability.

However, given the combination of pressures on the global food system it is highly probable that the increased **volatility** in food prices of recent years will continue and worsen.

The EU Standing Committee on Agricultural Research recently concluded:

***Many of today's food production systems compromise the capacity of Earth to produce food in the future. Globally, and in many regions including Europe, food production is exceeding environmental limits or is***

*close to doing so. Nitrogen synthesis exceeds the planetary boundary by factor of four and phosphorus use has reached the planetary boundary. Land use change and land degradation, and the dependence on fossil energy contribute about one- fourth of Greenhouse Gas emissions. Agriculture, including fisheries, is the single largest driver of biodiversity loss. Regionally, water extracted by irrigation exceeds the replenishment of the resource.*

*Price volatility, access restrictions and the interconnectedness of global commodity markets, as well as the increasing vulnerability of food production systems to climate change and loss of agro-biodiversity, will make food even more inaccessible for the poor in the future.* Link: [SCAR Report](#) page 132.

## **Impact in Scotland**

Scotland's economy is highly integrated in the world economy and thus shocks in the international arena impact strongly on the domestic market. This became evident in 2007-8 when food prices increased more in Scotland than in the Eurozone. Expenditure on food for the lowest income deciles increased to 22% of income.

As a result, low income households in Scotland have reduced their consumption of fruit and vegetables. Future shocks in price and availability may be far more severe and will have an even greater impact on access to nutritious food. In the case of harvest failures countries will put export bans in place and give preference to their domestic market before exporting (this was the case in Russia in 2008).

Some features of the Scottish food system make us particularly vulnerable to global shocks:

***Scotland's food production system*** is still heavily dependent on imported animal feed and on external inputs such as phosphate and reactive nitrogen as well as fossil fuel energy.

***Scotland's food consumption system*** relies not just on imports from tropical countries of foods we could not grow here but on significant imports of temperate fruit and vegetables as well as some meat, dairy and eggs. We also tend to export commodities (such as potatoes and grains) and import processed foods (such as crisps and breakfast cereals).

***Just in time supply:*** Scotland as part of the UK has the most industrialised 'lean' supply chain in the world. It works on a just in time basis, where hardly any stock is held in the system. Scotland maintains no stockpiles of critical foodstuffs that could provide contingencies to cope with interruptions in the food supply chain.

**Long distance transport:** Within Scotland livestock, foodstuffs and processed foods are transported long distances by road. 25% of road transport is linked to the food chain. In the last years blocked transport routes resulting from severe weather events caused disruptions in food and energy supply.

## **What could we do to prepare with our food system to prepare for climate change?**

Adapting Scotland's food system to climate change requires a shift towards 1) ecological farming and horticulture practices and 2) shortening and decentralising the food supply chain. Successful adaptation depends on 3) real community engagement.

### **1) Ecological farming practices**

Scotland's predominant conventional farming system depends heavily on fossil fuels: as a basis for producing chemical fertilizers and pesticides; and for running the machinery.

Soil fertility is lost through soil erosion (pronounced through heavy rain falls) and the failure to incorporate organic matter in the soil. Low soil fertility also results in poor carbon storage capacity. If just 1% of the carbon contained in (Scottish) soil was lost in a year it would be enough to triple Scotland's annual greenhouse gas emissions.

Globally, we may have lost as much as 40% of our topsoil in the last 100 years, and are continuing to lose soil many times faster than it is being made.

Furthermore, monoculture farming and the use of chemicals contribute significantly to biodiversity loss, habitat destruction, water and air pollution.

### ***Agroecology - Maintaining and increasing food production capacity***

In order to secure the food production capacity of our land we need to adopt agroecological farming practices such as organic farming and agroforestry.

**Organic agriculture** - through using organic fertilizer rather than chemical fertilizer - improves soil structure and soil fertility. Because of their high humus contents fertile soils:

- Store carbon
  - Organic farming produces 28% higher soil carbon levels than non-organic farming
  - the widespread adoption of organic farming in the UK would offset at least 23% of UK agriculture's GHG emissions.
- Retain nutrients
  - Healthy soils produce healthy, nutrient rich crops which can better withstand shocks and provide healthy food.
- Have high water retention capacity
  - This improves climate adaptation by reducing the impacts of flooding and droughts.

To create resilient agro-ecosystems we need to adopt a wide range of farming practices that reduce the dependencies on external inputs and close nutrient cycles such as crop rotation, mixed farming or agroforestry.

**Agroforestry** integrates trees on pastures, farms and in the agricultural landscapes. It can protect soils because it improves soil filtration and the root network of the trees stabilises soils. This is important in light of increasing soil erosion and downstream flooding caused by heavy rain falls.

Apart from the soil improvement trees on farms provide shelter and shade for livestock, predator habitats (which reduce the risk of pests taking over a crop), nutrient cycling and timber products that can diversify farming income.

### **What measures do we need to do that?**

- Making agroecology a priority in agricultural research and training
- A holistic farm advisory system which considers natural capital, carbon accounting and ecosystem services not just financial inputs and outputs
- Using the rural development funding for agroforestry in an ambitious and proactive way
- Setting national targets for organic farming, and supporting demand for organic food through use of public procurement
- Promote farming as a career and support small scale farming through community land banking and 'intraprisers' on larger holdings

## **2) Short supply chains**

With short food supply chains we escape food price volatility and cut dependency on fragile international markets and create wealth in Scottish communities.

Several studies, including the report from CPRE ([From field to fork](#), 2012) which measures the value of England's local food webs, give evidence on the benefits of short supply chains for the local economy. Local outlets support three times the jobs of national supermarket chains and every £1 spent on local food in a local outlet generates £2.50 for the local economy as compared to only £1.4 if spent in a supermarket.

Shortening the supply chains means that farmers sell their produce in the region where they farm. Contacts are established between the farmers and consumers.

How would that work?

- Linking farmers with farmers to form cooperatives
- Communities and cities contracting directly with Scottish producers
- Alternative retail outlets: food hubs, independent food shops, weekly markets, cooperatives
- Grow your own - in cities and rural areas, in gardens, allotments, community gardens, etc.
- Setting up storage facilities as decentralised as possible
- Setting up local food networks and linking networks with each other

- Aiming to become self-sufficient in temperate crops and building exclusively fair-trade relationships with other countries

### **What measures do we need to do that?**

- Commitment to support community scale infrastructure via structural funds
- Food brokers that mediate cooperation between farmers as well as making the links between farmers and communities/cities
- Empowering citizens through action learning networks to actively contribute to shaping their local food networks
- Access to land for food growing
- Training in horticulture for grow your own and commercial production
- Making loans and grants available for new farmer entrants and start up food businesses
- Business advisory system
- Planning system taking up food system planning which includes protecting fertile soil from development; regulating retail development; planning for reducing travel needs for grocery shopping and provision of basic needs; and recycling food waste and bringing it back on the land
- Green networks, as set out in the National Planning Framework, should include small scale food growing as a measure near settlements.
- Introduce a land value tax to discourage speculative land banking near cities and towns
- Set targets for organic food in public procurement
- Establish a house of food as a centre for training in sustainable cooking
- Promote a 'new Scottish diet' which is healthier and more sustainable
- Set up an economic institute (along the lines of the New Economics Foundation) which provides evidence on low carbon and community scale economics
- Extension of the Climate Challenge Fund which recognises the importance of food system change for mitigation of and adaptation to climate change

### **3) Engagement**

The first step is community engagement. The Scottish Government needs to enable citizens, civil society organisations and communities to fully engage in creating a vision for a resilient Scotland and their respective communities and develop place specific action plans to adapt to climate change.

Adaptation cannot be done by government agencies TO people but only together WITH people, since adaptation to climate change requires foremost a change in attitudes and behaviour.

### **No regrets**

Choosing where to invest in adaptation to climate change is difficult. One useful guide proposed at the recent Adaptation Scotland conference was to start with 'no regrets' actions – ones which would bring benefits even if the worst case scenarios do not materialise within the time frame.

All of the measures proposed are 'no regret' measures, meaning that even if we were not at risk from climate change they would help us to build a fairer, greener, smarter and wealthier Scotland.

They build natural capital (soils, carbon, biodiversity, water quality); public health; local economies; human capital (knowledge about growing, choosing and cooking food) and social capital.

### **Conclusion**

Climate change will impact unpredictably on food production systems both in Scotland and the rest of the world. Our national climate change adaptation plan has to help us prepare for the worst, while we continue to work with other countries to reduce greenhouse gas emissions and hope for the best.