CONSULTATION QUESTIONS

Question 1: Do the 2011-2016 strategic priorities remain robust and relevant for the period 2016-2021?

1. Nourish Scotland's view is that the strategic priorities and 'enabling principles' are defined so broadly that they are not suitable to guide the development of a sustainable research portfolio and programme. We miss a clear link of how the research strategy links to other Scottish Government, UK and EU policies aimed at building sustainable, resilient communities. For example, there is no connection to the goal of Scotland becoming a 'sustainable food nation' or to the EU communication on sustainable food.

2. A radical transformation of how we define and use science is needed.
   In agriculture we need to shift away from research-led intensification of agricultural systems and food-supply chains which have resulted in severe physical, but also economic, disconnection between production and consumption, or need.

   At the moment we underexploit science's potential versatility, especially neglecting the social sciences.
   We need a strategic reorientation of rural and agricultural research and development towards varied local conditions and needs, and towards farmers' and rural communities' knowledge — a science for the public good. Successful sustainable development requires tapping into the full potential of grassroots innovation to respond to locally-defined needs and priorities.

3. In order to find the right answers we need to ask the right questions. Regarding food and food security the question is more than a short-term production issue. Instead of asking almost exclusively how to maximise yields, we should ask why even existing production is denied to many needy people, while generating mass obesity and enormous amounts of food waste.

4. A new research strategy needs to support a transformation towards self-reliant, empowered communities looking to increase employment and reduce dependence on non-renewable energy. The drive for efficiency of the last decades has reduced employment and increased the use of energy.

Question 2: Do these 'enabling principles' set the right context or should additional principles be adopted?

5. A core enabling principle should be that all research should be systemic (ie looking at the whole system, not simply one component in isolation), properly multidisciplinary, developed and undertaken in partnership with stakeholders (farmers, communities); and should have a clear 'flow through' to extension services for dissemination.

6. We would see considerable value in research and development projects, where practitioners are working as co-producers of research. Our priorities here would include:

   Agroforestry: developing silvopastoral and silvoarable systems with farmers and farmer groups on a range of land types using a range of spatial arrangements and species, and monitoring productivity, biodiversity, financial returns, water management, soil quality etc. over time

   Urban and peri-urban agriculture: linking producers and citizens through low carbon, short supply chains and nutrient recycling

   Public food: horizontal integration of procurement at city-region level to develop sustainable short supply chains for fresh local produce; as well as culture change in the public kitchen to develop low carbon menus, improve quality and reduce waste

Question 3: Are the high level outcomes sufficiently clear, if not, what changes would you propose?

7. The Rural Affairs and Environment research spend is intended to support these national outcomes:
   - We value and enjoy our built and natural environment and protect it and enhance it for future generations;
   - We reduce the local and global environmental impact of our consumption and production;
   - We are better educated, more skilled and more successful, renowned for our research and innovation.

   Nourish's view is that the challenges in achieving these outcomes are as much cultural, social and political as they are technical and scientific; and that an effective research strategy should recognise and address this.

   The consultation paper recommends a 'systems thinking' approach: Nourish recommends the 'soft systems methodology' developed by Checkland and Scholes as a useful starting point for considering complex sociotechnical systems such as 'sustainable food'.

Question 4: Are the three broad themes identified an appropriate way of structuring our work? If not, what alternatives should be considered?

8. While the three broad themes proposed (health and wellbeing / productive and viable land use / ecosystem services) are all relevant and important, this way of separating the issues will surely lead to research partners doing what they do best – ecologists for the ecosystems, nutritionists for health, agronomists for production.

9. We will add to the sum of knowledge in each area, but we will be no nearer developing a shared map of the whole or being able to advise policymakers how to achieve our high level goal of being a 'sustainable food nation'.

10. In our view, the core of the research portfolio should be constructed as a small set of specific questions to be answered, most of which will require a truly cross-disciplinary response.

    These questions could be refined through iteration, but our initial suggestions are:

- What are the main negative externalities generated by the farming and food system in Scotland, and how can these be (a) reduced and (b) reflected in the cost of food?

- What would be the optimal (resource use efficient, waste reducing, natural capital enhancing, employment creating) pattern of land use, food production, processing and distribution to provide a healthy low carbon diet for the Scottish population? What would we sensibly grow and eat here, and what would we import?

- Can we develop and use a robust 'sustainable food index' which allows us reliably to compare our food system at national and regional level with those of other countries?

Question 5: How can the SG maximise the benefits of on-going investment in the MRPs to build and benefit from connectivity with the wider science base?

There are two points we would like to make here.

11. Firstly, there is great need for the MRPs to shift their research focus from a merely reductionist to a more holistic understanding of the problems they are addressing.

    12. Most of our agricultural sciences occupy the lower levels of organization such as molecular biology, cellular metabolism and how viruses and microorganisms cause disease. This reductionist approach has its justification if employed as a method within a

holistically defined research agenda. However, at the moment the reductionist approach is the paradigm in agricultural research and it fails to recognise agriculture as an ecological process. To give an analogy: One cannot solve traffic problems through the engineering of automobiles alone. One needs to use traffic engineering, even if traffic engineering is not as highly developed as automobile engineering. Automobile engineering may play a role in solving traffic problems, but only in relation to the higher levels of organization. For example, the number of automobiles on the road is not primarily a function of the design of automobiles themselves.

13. Most scientific problems in agriculture are concerned with populations, communities and ecosystems, and these are the domains of ecology not of other biological sciences. The crop is a population, while pest and diseases are populations of organisms with which the crop population interacts. This ecological community includes not only the crop and its pests, but also the natural enemies of these pests, plus many other species with which the crop interacts directly or indirectly, such as N-fixing bacteria and mycorrhizal symbionts, and decomposers in the soil. The agricultural field can be thought of as an ecosystem, embedded within a landscape.

14. Agroecology is the term used for applying ecological principles to agriculture. Agroecology as an alternative vision for agriculture and food supply has been called for by many scientists and organisations. Local expertise and knowledge integrated with leading scientific research have demonstrated a capacity to increase yields sustainably, decrease polluting inputs, promote food security and improve livelihoods.
    One analysis compared 293 farms globally and concluded that agroecological farms can produce 96 per cent of a conventional yield while improving soil fertility [1]. A separate study reported that, under severe climate conditions, two different agroecological systems of maize and soybean yielded 137 per cent and 196 per cent more than conventional systems, respectively [2].

15. Secondly, extension has been seriously neglected in the last decades. In the future as much effort needs to be put into extension as into research, with the leadership and staff of research and extension organisations appreciating the important roles that farmers and farmer organizations can play, both in disseminating research findings and, through effective feedback mechanisms, in helping set priorities and improving programme relevance. Each research project should be accompanied by a clear plan on how the findings will be put into practice.

16. For example, the Organic Research Centre has developed participatory, decentralised plant breeding approaches to create novel wheat varieties adapted to site specific conditions such as soil type, climate and management practices.

[1] *Renewable Agriculture and Food Systems* doi: 10.1017/S1742170507001640 (2007)
[2] *American Journal of Alternative Agriculture* doi: 10.1079/AJAA200345 (2003)

Question 6: What are your views of the performance and operation of the CoEs to date, are there any additional areas that would benefit from such support?

17. Following our recommendations would naturally imply changes in the delivery mechanisms covered by questions 6 to 16 in your proposal.

18. Generally speaking, Nourish would argue for a broader range of interests and perspectives to be engaged in overseeing the research programme. For example, there could be representation from public health and from the natural capital forum; and there could also be representation from rural communities and businesses who are also customers of this work.

19. The required changes in the way in which research is conducted and structured in government bureaucracy will also involve a shift in training agency personnel from an emphasis on technical solutions to including issues of communication, learning and change. It also involves a broader process of reorienting institutional policies, procedures, financial management practices, reporting systems, reward systems and norms so that it also reflects the views and priorities of citizens affected by the research.

Question 7: Do you agree with the SG's proposal to end support for SPs and to explore alternative mechanisms to strengthen engagement between its investment in research and the business sectors it aims to support?

Comments

Question 8: Do you have any proposals for how the research portfolio can better link to the business community to deliver the desired outcome?

Comments

Question 9: Is the purpose and value of underpinning capacity sufficiently clear, if not how can it be improved?

Comments

Question 10: Do you have any views regarding the performance and use of the Contract Research Fund including how it could be improved?

Comments

Question 11: Could the overall delivery model be further simplified in a way which still enables SG to meet its strategic priorities for the portfolio, if so how?

Comments

Question 12: Do you have specific suggestions as to how the RESAS research strategy can contribute to the delivery of the objectives of the CAMERAS partnership?

Comments

Question 13: Do you have any suggestions for developing the partnership with other research funders?

Comments

Question 14: Do you have any particular suggestions as to how greater engagement with the HEI sector might be achieved?

Comments

Question 15: Are the research outputs from the RESAS portfolio of research readily accessible or can this be further improved, if so how?

Comments

Question 16: Is the current performance management approach fit for purpose or can it be improved, if so how?

Comments