A COORDINATED AGENDA FOR MARINE, ENVIRONMENT AND RURAL AFFAIRS SCIENCE (CAMERAS) (2011-2016)

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Consultation Questions

Question 1: Do you agree that the two broad categories of 'Local Responses to Global Change' and 'Optimising the Potential of Scotland's Natural Assets' are helpful in providing an overlying structure to the Co-ordinated Agenda?	No, As the themes are set at such a high level they may be open to any interpretation. The current programmes of research could fit into any of the themes but focus and critical mass could be dissipated if this research was dispersed across the themes. The MRPs must be able to develop and sustain an international good quality science reputation which, in turn, will lead to funding opportunities beyond the Scottish science base. This also enhances the reputation and profile of Scottish science. Support for capability is very important. National capability is absolutely vital to Scotland. Institutes offer greater flexibility to respond to changing needs than the HEI sector. The consultation document does not explicitly recognise the role of the agricultural sector. The Government's own figures (http://www.scotland.gov.uk/Topics/Statistics/Browse/Agriculture-Fisheries/agritopics/LandUseAll/Q/EditMode/on/ForceUpdate/on) indicate that approx. 80% of Scotland's land area is represented by agricultural holdings with approx. 85% of that area used in livestock production.

Question 2: Are the descriptions of these set out in Section 3 (and Annex 3) comprehensive?	No, No and yes. The definitions are so loose they could encompass everything. These aim to reflect long term policy demands but policy can change dramatically with a change in government and this impacts on delivery. There is an expressed desire for flexibility within the evidence base and that science should "respond flexibly to sudden and unexpected changes". The changes in Theme 1 can originate both externally (Global) and internally (policy) but not from changes in science capability. The headline themes should reflect long term requirements which should not really change according to the election cycles of government. By and large, scientists are flexible and policy demands are met by shifting the emphasis of funding within the science base – the key here is to maintain a broad science base and to ensure that this breadth is not compromised by short term, expedient policy changes. Flexibility is a prerequisite when it comes to introducing technological and scientific advances arising from the global science and technology base. An example of this is the genomic revolution and its spin offs in e.g. proteomics. Science utilises, develops and analyses an evidence base relating to a specific question but policy is often driven by selective sampling from the same evidence bases. Given the changing nature of policy over a medium term period, the science base should also support curiosity driven research which may not necessarily be in line with current policy dictates but which may provide new insights which would aid policy decision making in the longer term. We note that the flow diagram in Annex 2 did not have any upward feeding arrows. It is disappointing that the areas of livestock health, crop protection and food security go almost unmentioned in the consultation. Scotland has a long history of high quality food products that contribute to Scotland's identity and worldwide reputation. Scottish meat brands such as Aberdeen Angus; the brewing and distillery industries; and the positive image of Scottish fresh produce are all based on having healthy and productive crops & livestock. Science to support these industries, rather than the development of government policy should be an underpinning theme in the consultation.

Question 3: Do these cover the major policy challenges where science can contribute as you see them?	No, No, not all of them. The themes are drawn up with a focus on challenges which may arise in the future as novel events but tend to ignore the fundamental and long standing challenges we have faced and will continue to face. The importance of diseases to health, welfare and productivity of agricultural species and hence impact upon societal and economic sustainability of the large number of communities in which agriculture is a significant component does not come through clearly in the document. The underpinning role played by the agricultural research sector in promotion of welfare and productivity is also underplayed – as well as providing an invaluable knowledge base, the innovative research conducted by such publicly-funded bodies can deliver direct economic benefits such as disease monitoring and intervention. Rather than directing increased effort solely to observational research, maintenance of an innovative research and development capability is crucial to the country's economic sustainability.
Question 4: Are they likely to remain broadly relevant over the longer time horizon (well beyond the 2016 focus of this Coordinated Agenda)?	No, Because the themes are so broad and loosely defined and they are not all inclusive
Question 5: Do you agree with the description of support for the National Capability Theme set out in Section 3 (and Annex 3)?	Yes, National capability is vital if science is to provide the correct information for current and future policy development. The key elements here are the intellectual capability backed by the appropriate facilities.

Question 6: What facilities, resources and data do you think are important for Scotland to maintain?	Those which are unique/essential for carrying out research. If animal health and welfare is important to the Scottish economy and future Policy (we think it is) then the minimum requirement is to maintain what we have. As noted above we must maintain the current intellectual and physical capabilities and this must be supported by constant opportunities for professional development to maintain the ability to exploit new technological and scientific advances. There is a need to look to the future and ensure that funding is available to train the next generation of scientists and technologists to allow adequate succession planning at all levels. On the issue of one-stop shops, we believe that it does not require the differing elements of the science to be housed at one site. Indeed, the latter leads to medium term inflexibility because the one-stop shop established today is likely to be inappropriate for tomorrow's needs. Properly coordinated Programmes involving different MRPs can be managed in such a way as to give a one-stop shop. We have been practising this in the existing Programmes. Existing Centres of Excellence are a good example – where the participating scientists have a shared research focus but are located in geographically distinct locations.
Question 7: Are there other resources that Scotland needs to acquire to support future policy developme nt?	Yes, More alignment of the Scottish Universities activities with Scottish Government objectives.
Question 8: Have we correctly identified the key policy issues and the associated scientific opportuniti es in Section 3?	No, The key policy issues are not clear here

Question 9: Are there additional issues that should be included?	Yes, The consultation focuses largely on the Strategic Objective “Greener” – while highly significant this underestimates the contribution that the scientific activities of publicly-funded bodies in the marine, environment & rural sectors can contribute to the other Strategic Objectives “Wealthier & Fairer”, “Healthier”, Safer & Stronger” and “Smarter”. “Science for Scotland”, the strategic framework for science published by the Scottish Government in November 2008 states a more extensive vision of science; “Science will underpin: • Our contribution to global issues which are relevant to us all, such as climate change and sustainable energy; • Improvements in public services and quality of life, including health and the environment; • Growth opportunities for existing businesses using science to solve their problems, develop new products, exceed their customers needs and • increase competitiveness; • New businesses and inward investment; • New jobs and careers – particularly for the highly skilled and qualified”
Question 10: What do you think will be the most important influences on Scotland’s future in the Marine, Environment, Rural Affairs and related areas?	Climate change is the obvious influence but science funding must be balanced in such a way as to allow an emphasis on solving existing problems whilst also allowing an element of forward looking. Climate change will, undoubtedly, influence the prevalence and seasonality of current endemic diseases, mainly parasitic, but also other microorganisms and vectors and will lead to the possibility of new diseases emerging. Food security and continuity of supply will be a priority rather than leisure based land use. Sustainable animal disease prevention and treatment regimes to reduce disease, improve animal welfare, maintain food supply and sustain rural communities. Related to this will be the expansion of biotech companies exploiting scientific intellectual property created by Scottish based scientists.
Question 11: Why do you think these are important?	Diseases have the potential to undermine economic growth for Scotland as they could remove an important sector of rural economy and therefore diminish sustainability. The creation of a world class biotechnology sector is a distinct possibility for Scotland and the CAMERAS MRPs make a significant contribution to this sector.
Question 12: Are there other scientific opportunities which should be highlighted?	Yes, Other major European economies including Germany, France and Denmark, are increasing investment in education and research sectors at present (http://bulletin.sciencebusiness.net/ebulletins/showissue.php3?page=/548/art/12951&print=1) and Scotland (which retains a high impact scientifically) risks relegation of its position unless funding remains focussed on innovative science.

Question 13: What existing areas of Scottish based scientific expertise should be maintained to contribute evidence to key policy issues?	The current structures have evolved over a long period of time and, in the case of the MRPs, provide centres of excellence in environment, plant and animals with modelling and statistical foci. This organisation allows the establishment of state of the art facilities to address specific generic issues which would be difficult to achieve in any other model. The current Programme has sought to bring down the barriers which have built up over the years by funding research in a cross cutting manner. This is beginning to work and should be encouraged. There are dangers in disaggregation. If we take Parasitology provision in the UK as an example we can see that virtually all research in the University sector is focused on disease where a laboratory model is available for reasons of ease of use but, importantly, cost. This has led to an erosion of the effort put into countering endemic parasite problems because the facilities to house livestock in control conditions are costly and have been given a lower priority in a cost conscious University sector.
Question 14: How clear is the relationship between the scientific areas and the key policy issues?	There needs to be more work done here. For the current programme now underway, the commissioning process involved the Scottish Government setting its framework of policy issues which it wanted research to inform. Then detail was added to identify the specific research questions to be addressed and then MRPs put forward their proposals within this framework. Then these proposals were reviewed by external peer review, by SG policy units, and finally agreed with the MRPs. So, in theory, the science and policy issues were closely aligned. For the new Programme it is not clear how all of the those different participants will be involved.
Question 15: In which areas of science can we continue to make use of expertise supported elsewhere e.g. at the UK, EU and international levels?	Science is a collaborative effort and involves global collaborations to address common issues. It is not a case of us continuing to make use of expertise supported elsewhere but more a case of continuing to make our contribution to the global effort. We cannot depend on the effort and good will of others but we must coordinate our efforts with international counterparts. This type of approach is often funded by the EU and Research councils. One proven way of accessing this expertise in the UK is to restore the Flexible Fund Initiative for RCUK funding or bring in something similar to allow joint research projects between the MRPs and the UK university sector.

Question 16: In the time frame for CAMERAS (2011-2016) what new emerging areas of science are likely to mature and become available for more general use or application ?	Exploiting the genome resources to provide solutions to problems. At the moment, we have an explosion in genome information but there is a lag in the tools available for really practical exploitation. More effort will be directed into a genotype to phenotype approach, especially in biological systems where the organism can be readily cultured or cultivated in the laboratory. And conversely where the ecosystems are not well defined meta-genomic approaches have great potential to provide new and exciting information on what is present especially when the organisms are viable but non culturable
Question 17: Do we have the expertise available to be able to use these new opportunities?	No, Not entirely. It is a question of investment in the required resource. We must support the next generation of scientists by providing high quality research training and then continuity to undertake their research.
Question 18: In which areas does Scotland need to be self reliant?	Various observers of science and the economy (see, for example http://www.businessweek.com/innovate/content/oct2008/id20081027_851140.htm or http://www.britishscienceassociation.org/web/News/ReportsandPublications/Magazine/MagazineArchive/SPAArchive/SPADec08/_DusicSPADec08.htm) highlight the importance of supporting innovative science in growing our economic capacity. In this, the important role of Government funding during an economic downturn in order to maintain or even grow the conduct of basic research .

Question 19: Knowledge Exchange is essential for scientific activity to achieve impact. Do you agree that KE should be an explicit and integral aspect of the delivery of this Coordinated Agenda?	Yes,
Question 20: How can we continue to improve the integration of evidence from a diverse range of sources into forms that are accessible to end users?	By coordinating the outputs in a joined up manner and using professionals to distil the essence from the various outputs. Knowledge Scotland provides a model for the future.

Question 21: How can we reconcile the requirement for science to be responsive and flexible to short term demands while at the same time ensuring that longer term strategic research continues to progress our knowledge and understanding?	By clearly defining the requirements in any funding initiative and close discussions with the MRPs, Policy Groups and Stakeholders. It also essential not to be to too directive in any call to allow for the bottom up flow of innovation. It is important to recognise that MRPs have a substantial amount of research funding not directly related to policy issues but having profound influence on the underpinning science. The outputs from this also have to made known to Policy Groups and Stakeholders.
Question 22: How can we ensure that the 2 way flow of knowledge from science to policy and from policy to the academic community is optimised?	By adopting best practice wherever it can be identified. This is a responsibility for everybody involved. Knowledge Scotland is one way. This puts an onus on MRPs and Policy makers to communicate effectively through a variety of media forms.

Question 23: Are there alternative structures/ systems or new approaches /organisations that could enhance these flows?	Yes, Knowledge Scotland is one way
Question 24: Are there science delivery models which could provide examples of good practice for Scotland to follow?	Yes, I am sure there must be out there but we are finding our own way in this and this is to be applauded.
Question 25: We would also welcome any other general comments you may have on any of the issues raised in this document.	The consultation needs to recognise that most outputs in the areas of science outside economics and social studies are not produced to be evidence for policy development but are aimed at innovation to directly improve the social, physical and environmental well-being of our society. Examples such as environmentally-friendly pesticides; the use of biological rather than chemical solutions to encroachment of new plants, animals or diseases; improved animal health products; improving the health or environmental impact of livestock or crop plants through better-informed breeding programmes, all demonstrate practical outputs that may support the execution of policy goals rather than the development of new policy. It is also incredible to think that science that does not inform policy development would be consigned to a ‘watching brief’. The strength of Scotland’s science base should not just be in its ability to provide evidence in support of policy development but in the production of new scientific data for the development of new technologies, medicines, vaccines and approaches to deal directly with the challenges of our changing world.