

Educating the Climate Advisors for Agricultural and Natural Resource Managers

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Appropriate use of climate information in decision-making for land-based industries is vitally important in order to cope with the natural variability of current climates and with the future challenges of human-induced climate change. Information provided by meteorologists and climate modellers is complex and potentially difficult for natural scientists and those advising agribusiness to understand and use. Nevertheless, highly skilled professionals – let's call them climate advisors – with a particular combination of skills across different disciplines are needed. In this presentation I explore the education needs of future generations of climate advisors to make the experts that are comfortable handling climate information and advising stakeholders in agricultural and natural resource management.

A student's progression through traditional undergraduate and postgraduate education involves progressively increasing expertise and single discipline specialisation. Most of our institutions of higher education are structured to facilitate this pathway. Cross-disciplinary study runs counter to most institutional structures, with specific difficulties around project supervision, which department awards degrees, and where an individual 'sits' or 'belongs'. However, our future climate advisors need to combine specialised knowledge of agricultural and natural resource science with an appreciation of climate science and the social and economic sciences that influence business decisions. How can we provide the education opportunities that provide these unique individuals?

There are two key attributes that our climate advisors of the future require. The first is a thorough grounding in the subject matter required: the natural sciences; a reasonable level of quantitative skills; and an overview of climate science. They need to understand, for example, sources of uncertainty in climate projections on seasonal and decadal timescales, spatial and temporal scales of climate model output and how to communicate probabilistic information to decision-makers. Topics this diverse are not usually offered at a single institution. Access to short courses nearby (through credit transfer) or at remote sites (through e-learning modules) could be used to expand educational opportunities. Gaining such education is tough, and a strong willingness on the part of individual students and instructors is clearly needed.

Despite the need for climate advisors with multi-disciplinary skills, we should recognise that any single individual cannot be an expert in too many subjects. Following a graduate course in crop science with one in meteorology and then, perhaps, economics will simply produce perpetual students. The second key attribute that our future climate advisors require is a high level of non-subject specific skills, for example in team-working, communication and inter-personal skills. This will enable them to be part of expert teams of advisors drawing on a range of disciplines. In the UK training in such generic skills has become an integrated part of doctoral training. However, education does not end at graduation. A well-rounded expert may only emerge after a period of training within industry. Indeed, we are now seeing moves to incorporate industrial placements within doctoral programmes, a change that can only improve the relevance of future graduates to the needs of stakeholders.

In conclusion, the education needs of our future climate advisors are quite specific and special. We need strong specialists with an appreciation of knowledge outside their discipline, but also with the inter-personal skills to work as part of effective teams of climate scientists, natural scientists, and social scientists in order to better meet the expectations of stakeholders in agricultural and natural resource management.

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