Written evidence submitted by the Chartered Institute of Ecology and Environmental Management (GAP0031)

EXECUTIVE SUMMARY

- Surveys by CIEEM and The Wakeman Review show there is a gap in skills between what is taught in environmental STEM subjects.in HE and what the environmental profession requires
- There is a lack of knowledge surrounding the range of environmental careers and their characteristics/requirements. This has been cited due to a separation of ecology and industry in schools.
- The lack of members of staff within education with environmental practioner experience is an issue. The focus on REF and research in HE promulgates this
- Higher education generally does not prepare graduates well enough for industry demands.
- Skills lacking include converting theory into practice and 'soft skills', such as communication, amount and type of practical and field experience.
- CIEEM has an accreditation scheme designed to guide students towards skills that meet industry demands and has already accredited 18 programmes
- HEIs and employers should integrate more. This would include influencing syllabuses, practioner input to taught modules, as well as providing placement, internship and work experience opportunities.
- Guidelines for apprenticeships are currently being explored by CIEEM. The added financial burden would be compensated by a more reliable, better trained workforce.
- Identification and survey skills were especially valued at the entrant level, with management and communication also required.
- Managerial and communication skills were the most important competences to be developed in experienced professionals.
- CIEEM has implemented a competency framework for the profession and has mapped the required competencies for graduate entries and providing a trainee-funded programme for skills gaps.
- Training at the advanced level is under-resourced.

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INTRODUCTION

ABOUT CIEEM

CIEEM is the leading professional membership body representing and supporting ecologists and environmental managers in the UK, Ireland and abroad. Our Vision is of a society which values the natural environment and recognises the contribution of professional ecologists and environmental managers to its conservation.

Established in 1991 and receiving our Royal Charter in 2013, we have members drawn from across the employment sectors including local authorities, government agencies, NGOs, environmental consultancy, academia and industry. The diversity of our membership is our greatest strength, enabling us to take an integrated and holistic approach to furthering the management and enhancement of biodiversity and the ecological processes essential to a fully functional biosphere.

CIEEM has from its inception worked with academics and practitioners to strengthen the links between these, since 2013 CIEEM has accredited HE programmes which develop graduates with the skills, knowledge and understanding to go on to work in the profession.

SKILL SETS REQUIRED

The environmental profession, and within the professions of ecologists and environmental managers are key to the long term sustainable development of UK PLC. Tackling modern day local and national/international problems such as poverty, climate change, flood management wellbeing and pollution control require practitioners with understanding of environmental systems and how these link into economic and social development. The skillset of an ecologist or environmental manager is large and complex. Practitioners tend to be drawn in either as an extension of a leisure interest (e.g. bird-watching) or for the ethical appeal. However, industry demands technical expertise (often, but not solely, in species identification), business acumen, statistical skills, computer-literacy and an ability to communicate with non-environmentally-minded people and organisations. Often this means graduates have undertaken courses with little regard to the industry demands of a future career. CIEEM has produced a competency framework for environmental practitioners which covers all the skills required to work within the profession, see http://www.cieem.net/competency-framework

REVIEW OF EVIDENCE

STEM SUBJECTS SKILLS SHORTAGE

A survey by YouGov/Mathworks (2013) found that 59% of businesses and 79% of universities state a shortage of skilled candidates leaving education to meet industry's employment requirements. Over 80% of employers state this will have an adverse impact to the economy of the UK. This is backed by the CBI (2014) affirming that over 40% of employers have difficulty recruiting workers with STEM skillsets.

ENVIRONMENTAL STEM SKILLS SHORTAGES

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The Wakeham Review of STEM degree provision and graduate employability (2016) suggests STEM skills are valued by employers, leading to increased earnings and productivity, when evaluated at the graduate level. However, >35% of graduates stated that they did not agree that their studies in Environmental Science tallied with the needs of employers. This is also reflected in relatively poor employment prospects for graduates of Earth, Marine and Environmental Sciences.

The Ecological Skills Report (2011), commissioned by CIEEM determined that there were specialist skills gaps and skill shortages in species identification, surveying and assessment, especially of invertebrates, fish and lower plants.

Additional skills shortages were found in both Ecological Impact Assessment (EcIA) and Strategic Environmental Assessment (SEA), as well as habitat creation, restoration and management in marine, coastal and upland environments; plus a limited understanding of dealing with invasive species and wildlife diseases. In addition, there are clear knowledge gaps regarding the application of environmental economics and techniques for the valuation of ecosystem services, spatial planning and mitigation.

CIEEM undertook a further review of the skills gap in their area in 2016 (to be published in 2017). The methodology of this survey was altered as it was found that, although there were skills gaps in areas such as taxonomy of invertebrates and lower plants, these were not skills with a high industry demand. The survey therefore focussed upon skills that respondents had to develop in recent practice and those that they needed to develop in the next 3-5 years.

The 2016 CIEEM survey determined that, in the recent past, respondents had to develop their survey and identification skills. This is particularly true of more recent entrants to the profession. Management and communication skills were also highlighted.

Priority skills to be developed in the next 3-5 years contained the same message. However, management skills were particularly emphasised. Of these, project and business management was highlighted, with leadership and managing people also stressed. Of the communication skills required, 'soft skills' including communication with clients and negotiation were highlighted.

The importance of 'soft skills' is in agreement with the Wakeham Review (2016) which suggests employers found work-readiness skills are strongly lacking in graduates. Employers also found graduates did not have appropriate quantitative skills and mathematics.

RESPONSES

CONTINUING PROFESSIONAL DEVELOPMENT

In response to the Ecological Skills Report (2011), CIEEM devised a framework to support members in identifying their current and required levels of competence and to plan their continuing professional development to achieve these new levels. The Competency Framework recognises 25 technical competencies (i.e. specific to being an ecologist or environmental manager) and 15 transferable competencies (i.e. common to most professionals).

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CIEEM runs a series of events aimed at alleviating skills shortages. These are grouped into Beginner, Intermediate and Advanced classes. Their relevance to the industry is justified by mapping learning outcomes against the Competency Framework. CPD is a requirement of continued membership of CIEEM. However, there has been recognition of a shortage of knowledge transfer exchange at the advanced level. Due to the advantage (and often necessity) of these skills, the cost of payment is normally undertaken by either the attendee or their company.

EDUCATION

Lack of knowledge and understanding of ecology and the environment and the careers relating to these is a problem which begins in schools. An environmental school curricula was considered back in the early 1990s but was not included in eth National Curricula. Ecology and environmental topics are generally covered in the biology and geography curricula, in may cases they are taught by teachers who have not studies these subject in any depth in the HE degrees. Many biology and geography degrees include little or no ecology (field biology) or wider environmental management. Lack of teacher understanding and experience exacerbates this problem

The Ecological Skills Report (2011) suggested promotion of ecology and environmental understanding at the school level, with this to include an emphasis on careers and industry opportunities. CIEEM has attended a number of events promoting a career in ecology to school-leavers. Examples of this would be delivering careers talks to the British Ecological Society's Summer School and hosting a section of the Open University's online careers programme.

CIEEM is currently developing a schools toolkit for members to use for promoting environmental careers. The logistics of contacting the correct people within individual education organisations has been highlighted as a weakness. CIEEM has recently met with the Head of Inspiration for Hampshire in order to develop a strategy for providing better information about ecology and environmental management as a career into schools. However generally our experience is that structures for providing careers guidance into schools are disjointed and difficult to access. Professional bodies have much to offer in the way of insights into STEM careers but need to be able to understand and access ways of getting this information into schools in a cost effective and efficient way.

ACCREDITATION

Within higher education, the Wakeham Review (2016) suggests the use of accreditation to inform degree structures to better align skillsets with employer demand. This report highlights the struggle for graduates to translate theoretical knowledge into practice.

Accreditation of programmes and research that deliver the required knowledge and skills is now undertaken by CIEEM within Higher Education Institutions (HEIs). The development of the accreditation scheme was undertaken in consultation with employers and early career members. Accreditation focusses on the application of theoretical knowledge in 'real world' situations. This is partially achieved by significant practical experience, much of which should be in the form of fieldwork.

The Wakeham Review (2016) suggests that by drawing upon the experience of both the Engineering Council and science disciplines with a well-established accreditation system, a body such as the Science Council could develop and oversee a unified accreditation framework for science disciplines. Whilst this has some merit, there is a danger that the more practical field-based aspects of our subject area could be diminished.

Industry/Academia Partnerships

Over half of employers and almost two-thirds of academics included in the YouGov/MathWorks survey (2013) suggested a closer partnership between industry and universities. This idea is also taken up by the Wakeham Review (2016) which suggests the technical skillset of degrees could then be more effectively matched against career aspirations and employer needs. Also stressed was that, through collaboration, soft skills and commercial awareness could be gained more effectively.

The Wakeham Review (2016) stresses that employers see a lack of work experience in graduates, combined with poor career planning. Although the CIEEM accreditation focusses on "the application of theoretical knowledge in 'real world' situations", student placements and work experience was highlighted as enhancing employability.

Although industry/academia partnerships have multiple benefits, there is currently no agreement in place as to how these can be structured. CIEEM has produced a flowchart to guide employers in identifying the differing requirements for work experience, placements and internships, including a guide to pay and conditions. However, this has not yet been published.

After graduation, it is often the case that graduates will need to spend time, sometimes measured in years, undertaking voluntary work before gaining their first position. Apprenticeship schemes exist in some, but not all, companies, although City & Guilds (2011) report that 89% of employers see apprenticeships as critical to their business (not restricted to STEM employers). This can result in strong candidates leaving the profession due to financial restrictions. CIEEM is currently working on a document to guide apprenticeship schemes. This will be scaled according to the size and type of organisation. This will shift the cost of training from the graduate undertaking voluntary work to the industry training candidates. However, companies, such as consultancies, often employ seasonal workers to cope with demand. It is possible that, by introducing a more structured approach, industry would have better access to highly-trained professionals willing to stay in the business.

Conclusions and Recommendations

Recent surveys consistently identify the skills gap in environmental STEM subjects. The lack of industry-orientated environmental matters at school mean there is a disconnect between careers and aspirations. Both students and employers state that higher education does not prepare graduates well enough for industry demands. Skills lacking include 'soft skills', such as communication and converting theory into practice. Lack of suitably qualified and skilled graduates entering the environmental professions will have clear impacts on UK PLC ability to respond to emerging local and global problems, to develop sustainably and meet governments' social, economic and environmental targets.

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CIEEM has hosted careers talks at a number of locations and are close to developing a schools toolkit to aid in this. However, the logistics of connecting with the correct members of staff is an issue and careers guidance structures within schools and within education authorities appear to be fragmented and difficult to access. More guidance/support to professional institutions to enable them to strategically target their advice would be helpful.

CIEEM has an accreditation scheme designed to guide students towards skills that meet industry demands. There is a recommendation that HEIs and employers integrate more. This would include influencing syllabuses, as well as providing placement, internship and work experience opportunities.

Guidelines for apprenticeships are currently being explored. Although there may be a financial burden to employers, this would replace at least some seasonal staff and give employers a more reliable, better trained workforce to draw upon.

Skills gaps for professional ecologists and environmental managers have been identified by CIEEM. A framework to guide required competencies has been adopted, with workshops and masterclasses provided to meet these requisites. These are funded by attendees (often through their employer).

Training at the advanced level is under-resourced. A recent survey by CIEEM indicated that managerial and communication skills were the most important competences to be developed in experienced professionals. This concern needs to be addressed by HEIs and industry, with guidance from CIEEM.

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