

ESPA Knowledge Strategy

Introduction

The goal of the Knowledge Strategy is to support the design and implementation of world-class science demonstrating how ecosystem services contribute to the sustainable alleviation of poverty, especially in low-income countries. It is intended to provide guidance to project teams and will also be used to underpin the synthesis of knowledge produced by the ESPA programme.

The Knowledge Strategy aims to stimulate and focus research projects, synthesise their findings with those from other researchers and ensure that outputs are communicated for use by the broadest spectrum of users. Together with the [ESPA Impact Strategy](#) the Knowledge Strategy ensures that ESPA research, at the level of individual projects as well as across the whole programme, addresses topics that will improve the lives of the world's poor, directly and indirectly.

ESPA's approach was informed by the [Millennium Ecosystem Assessment](#) (MA) but the programme has moved beyond the MA's conceptualisation especially in terms of novel and innovative links between environmental and developmental objectives. ESPA research is now generating evidence describing the multidimensional nature of development impacts as indicated by human well-being, poverty and growth within the context of a range of social ecological systems being studied.

ESPA considers that people are an integral part of ecosystems (effectively part of a social ecological system) and that sustainable alleviation of poverty is the main goal of the programme.



Figure 1 **ESPA Knowledge Framework.** Three sets of interactions (blue: well-being of the poor; green: ecosystems and their services; yellow: social, economic and political enablers of change).

All ESPA projects must show how advances in knowledge and poverty alleviation impacts may be expected from their research. Applicants and project teams must show how their research plans and activities address the complexity of linked social-ecological systems in the Knowledge Framework and how outputs may address the complex research, evidence and impact challenges posed by the ESPA programme.

A key challenge for ESPA projects and researchers is to capture the full complexity of the Knowledge Framework. ESPA does not consider that ecosystem services are uniformly 'positive' or impact strategies are faultless. Emerging findings indicate that conflicts, disservices and trade-offs are critically important, and that ecosystem services do not necessarily contribute to poverty alleviation for all people in all circumstances. Understanding the processes, and causes and consequences of these complex relationships, lies at the heart of ESPA research. ESPA looks for signs that projects are building innovative thinking and practice into their research and impact activities recognising this is needed for ESPA to succeed.

When preparing proposals for ESPA research, applicants should refer to the relevant Announcement of Opportunity for information about the call and types of research likely to be funded.

ESPA Knowledge Framework

The ESPA Knowledge Framework is described in more detail below. It is regularly updated incorporating feedback from the ESPA community as ESPA progresses through its research calls (2009–2014), related consultations, workshops and other fora for idea- and knowledge-exchange.

The Framework is a conceptual representation of the main components of ESPA's system of interest, showing their inter-relationships and linkages. It is intended to provide a readily understood, logical and consistent approach to enhance coherence across projects and permit the derivation of clear and generally applicable conclusions. The conceptual framework supports the development of a common understanding of those topics and relationships relevant to ESPA. The framework presented in this document is intended to help consistency and compatibility rather than being prescriptive. Projects are encouraged to adapt the Framework to develop approaches that are appropriate to their own contexts.

Component 1: People, human well-being, poverty and poverty alleviation

ESPA aims to improve the lives of the poor through the alleviation of poverty. Poverty, in its broadest sense, can be understood as a lack of, or inability to, achieve a socially acceptable standard of living or possession of insufficient resources to meet basic needs. It is created and perpetuated by different processes and social relations in different locations, and is experienced and conceived differently according to context. Poverty needs to be understood as being strongly influenced by the resources that people can claim, under what conditions and with what level of choice. Social differentiation, distributional concerns and issues of power are central to poverty analyses.

In recent decades, the conceptualisation of poverty has broadened beyond a focus on income to include non-monetary components. Poverty is now recognised as being multidimensional. This multidimensionality does not necessarily change who is characterised as poor, but will significantly affect how poverty is conceptualised and therefore how poverty alleviation can be achieved.

The choice of which dimensions to include in any research project should reflect the way that communities and individuals at research sites understand and experience poverty and be appropriate for the scale of research activities. Multiple deprivations compound the difficulty of trying to escape poverty, so understanding the connections and interactions between dimensions is critical to designing effective poverty alleviation policies. Poverty dimensions may include (but are not limited to) the following: food security and nutrition, health, income and assets, fuel and energy, social capital, vulnerability and resilience, water, education and skills, access to public goods, employment, property rights and time.

The Knowledge Framework recognises the major environmental and economic changes experienced by poor people in a globalized world, and the new and shifting vulnerabilities which are created by these changes. ESPA research needs to consider routes out of poverty based on the sustainable supply and utilisation of ecosystem services in a changing world. Research needs to describe the dynamics of poverty and how people are able to move and stay out of poverty.

See the ESPA [Poverty Framework](#) for more details.

Component 2: Ecosystems and ecosystem services

Ecosystems are characterised by interactions between biotic and abiotic components of the environment and it is these interactions that characterises each ecosystem. Ecosystem structures and processes underpin a variety of ecosystem functions and capabilities (in MA terminology, supporting services). These include primary production, water regulation and nutrient cycling that ultimately support ecosystem services (provisioning, regulating and cultural services), such as timber production or freshwater provision, from which people benefit.

It is these ecosystem services that conclude the delivery chain of outputs from ecosystems that provide benefits to people. Material goods, such as food or fuel, or non-material goods, such as climate regulation, cultural benefits or flood prevention, are defined broadly to include all goods and services (essentially 'good things') that people use and value.

ESPA separates goods/benefits from ecosystem services. A benefit is regarded as something that has an explicit impact on changes in human welfare, such as more food, income, a lower disease burden. Ecosystem services are the constituents, processes and products of ecosystems that provide benefits for human well-being.

Material and non-material goods have values, whether or not clearly apparent, which can be measured in monetary and/or non-monetary terms (e.g. health status, cultural appreciation), although the latter are harder to realise and are often contested. For example, the same goods may have different values depending on the context (scale, place, time, person, etc.). Whatever the case, the values derived from ecosystems can influence how people treat and manage the ecosystem. As a consequence they influence ecosystems in various ways and changes to natural structures and processes may result. The process by which valuation of goods or services is carried out is also an area of ESPA research in its own right. Valuation must be embedded within a social and cultural context and take into consideration both the monetary valuation of market and non-market goods and non-monetary assessments (quantitative and qualitative). It is also important to understand that **values and norms** of the people interacting with the ecosystem can affect the benefits derivable and the ecosystem structure and processes.

It is an understanding of these links between benefits from ecosystems and people and the role of scales (time and space), institutions and markets in supporting or compromising these links that is fundamental to ESPA research.

Component 3: Enabling Conditions

ESPA identifies a number of different societal structures, institutions and processes that can provide enabling conditions for poor people and societies to sustain benefits derived from ecosystem services. These societal structures and processes include partnerships; change enablers; global ESPA knowledge; political economy; external drivers of change; and innovation.

Partnerships enable change through local structures and relationships affecting livelihoods, equity and local resource management. Together, these influence how poor people can use ecosystem services to enhance their well-being.

In some contexts, local knowledge will provide useful information that complements knowledge generated through scientific study or experimentation. ESPA projects should therefore consider how local knowledge can contribute to the research agenda and how this knowledge would be best used. ESPA researchers should refer to ESPA's Impact Framework documents (www.espa.ac.uk) when considering how a range of non-traditional research partners can play a valuable role in developing new ideas and knowledge, but also in translating research into results and real impacts. All of the knowledge generated through ESPA projects should contribute to the pool of **global ESPA knowledge**, which will ultimately become global public goods that can then feedback into the cycle as an enabling condition.

Political economy is an enabling condition and refers to governance, social structures, market and institutional arrangements governing/directing/influencing social, political and economic processes that ultimately determine the management of ecosystems. It refers to political actors and their behaviours that influence the direction of changes in economic and social systems and their ability to deliver benefits from ecosystem services. These essentially relate to who decides what, when, where and how, which in turn determines potential 'winners and losers', at temporal and spatial scales that may partly decide whether in practice this is realised and perceived.

The **external drivers of change** include social, political and technological and environmental processes that can influence the ecosystem services and benefits. Societal changes can include demographic change, economic growth or education. Political change may involve changes in the governance structure or composition, while technological change could include new ways of capturing benefits from ecosystems, but could equally be a change that has a negative impact on ecosystems and the people that depend on them. Finally, environmental change can be long-term (e.g. climate change) or short-term (e.g. application of new fertilisers or water pollution). Each of the components of external drivers of change has capacity to, and will, impact both on people and on ecosystems. In all cases, it is important for ESPA research to recognise that the external drivers of change may be negative or positive and that in some cases change is irreversible. Drivers may also be dynamic and will subject the system of interest to continuous change. Examples of such dynamic drivers include: population, demography, migration, climate, environmental, institutions, governance, technology and social and cultural values.

Interactions between the three components

There are interactions between the three components of ESPA's knowledge framework as well as within them. ESPA's ambition is to undertake research on these interactions in order to ultimately achieve sustainable alleviation of poverty. Not only does this require working across all three kinds of processes (i.e. human well-being, ecosystems and the enabling conditions for change), but it also necessitates examining the consequences across spatial and temporal scales (see Figure 3).

Scales and thresholds: Some ESPA research activities will need to consider the existence and importance of **critical limits** or **thresholds** in systems being studied. Both biological and social

systems have non-linearities and/or **tipping points**, when under some pressure, the system is known to switch from one state to another at some point. The non-linearities introduce complexities that make a system perspective or approach necessary for analytical framework, while tipping points suggest the likelihood of bifurcations and introduction of new trajectories of change that can either be positive or negative. These points are crucial both for understanding and then planning to work with a system.

Spatial interactions: These can be biophysical: some ecosystem services may provide benefits at regional scales but have costs locally (e.g. freshwater provided to downstream communities may lower the local water table, causing loss of soil and soil quality), others may operate the other way around (e.g. food production from aquaculture could benefit local communities but inputs and outputs could produce pollutants and other costs regionally). Local conversion of land for agriculture and human infrastructure has delivered great improvements in food and energy production but with consequences for the regulation of the climate system.

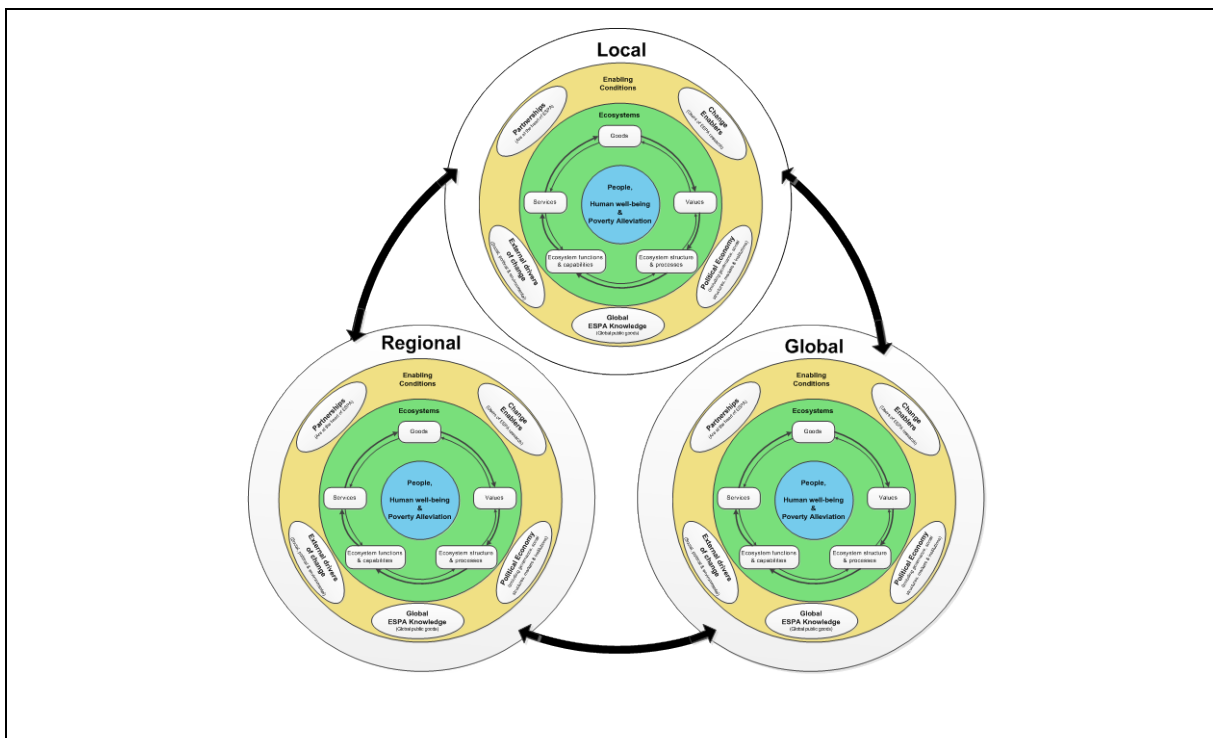


Figure 2 Interactions in ecosystem service delivery across spatial scales.

A further complication is that ecosystem services can operate over scales that cross geo-political boundaries, where the generation of ecosystem services and subsequent capture of benefits may be spatially distinct, separated by many hundreds of kilometres and located in different political and legal jurisdictions. The resulting cross-boundary issues create a particular challenge in the political economy of ecosystem services. Governance systems and institutions can also act at – and across – multiple scales.

Temporal interactions: Short-term gains may have long-term costs, yet sustainable development requires that future generations should not be deprived of options. Hence, any investigation of any combined social and ecological system should consider the longer-term impacts. Figure 2 illustrates time scales in terms of human generations.

Poverty dynamics describe how poverty changes over time, whether people move into or out of poverty, stay poor or become poor(er). Analysis of these dynamics should consider short-term (e.g. seasonal) and long-term factors, and the distribution of changes across social groups.

There are often **trade-offs** associated with the pursuit of multiple objectives, by multiple stakeholders, across multiple spatial and temporal scales. Figures 2 and 3 illustrate how the features of the research framework may interact across and between different spatial and temporal scales and highlights the importance of considering all aspects concurrently in order to identify and, where possible, account for, any potential trade-offs and synergies.



Figure 3 Interactions in ecosystem service delivery across temporal scales.

The Role of the ESPA Directorate

The ESPA Directorate maintains the Knowledge Strategy, which is regularly updated to ensure that the programme as a whole achieves maximum impact. The Knowledge Strategy is a joint collaborative process between the Directorate, the programme's [International Programme Advisory Committee](#) (I-PAC) and ESPA's research projects. The ESPA Directorate's role is to add value **to the contribution of individual ESPA projects**. This is achieved in a variety of ways including networking, sharing of data, tools and techniques, and effective integration of results.

Key roles for the Directorate over the course of the programme are as follows:

(a) To develop interdisciplinary working relationships

ESPA science includes natural and social science – areas of work that have not traditionally collaborated closely – and where there are some fundamental differences among the research communities involved in their approach, language, evidence-base and methods for communicating findings. A key priority for ESPA is to break down these barriers. The main way that this is done is through events organised by the Directorate and through a number of targeted small grants.

(b) Ensuring the quality and relevance of the science

Directorate research staff monitor scientific literature to identify relevant new findings, approaches and insights. The Directorate makes these available to the wider ESPA community. In addition, ESPA-funded researchers will be required to contribute their findings through an ESPA Data and Publication repository. Examples of new findings and approaches that can be adopted more widely will be communicated to specific projects as well as being communicated more generally. In this way we plan to radically speed up the rate of positive feedbacks among different elements of the programme. The ESPA website and newsletter are the main ways that this information is communicated to projects and other stakeholders.

(c) To integrate and synthesise knowledge relevant to ESPA

The Directorate will undertake synthesis of research emerging from ESPA, both internally and through commissioned research. The programme plans to commission a set of synthetic research projects that will run from 2015 to the end of the programme in 2016–17.

There are many related projects and programmes elsewhere in the UK and overseas, including, for example, the UK [National Ecosystem Assessment](#), [The Economics of Ecosystems and Biodiversity](#) (TEEB), the UN's [Poverty Environment Initiative](#), the [Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services](#), the World Bank's [Wealth Accounting and Valuation of Ecosystem Services](#) partnership, the UK's [Natural Capital Initiative](#) as well as the large, collaborative Natural Capital Project and InVEST (Integrated Valuation of Ecosystem Services and Trade-offs) (<http://www.naturalcapitalproject.org>). The ESPA programme collaborates with a number of these programmes and when appropriate can facilitate links with ESPA projects.

(d) Organise scientific meetings and build links to other science programmes and societies

An annual ESPA Science conference is organised by the ESPA Directorate. In addition, ESPA seeks to organise topical symposia, workshops or other activities at the meetings of other scientific societies. This takes ESPA out into the open, to other disciplines and into contexts from which it can learn and where it can in turn be instructive, synergistic and inspirational in terms of both thought leadership and practical implementation.

(e) ESPA Fellowships

ESPA is launching a major new initiative to create and support a global network of ESPA Fellowships. The programme intends to support approximately 12 ESPA Fellows between 2014 and 2016 who will work with existing ESPA projects and the ESPA Directorate. There will be two schemes.

(1) ESPA Early Career Research Fellows will be supported to develop the skills and experience required to launch their own independent research career working in an area relevant to ESPA.

(2) ESPA Research Capacity Strengthening Fellowships have a greater emphasis on personal research capacity strengthening than the Early Career Research Fellowships.

(f) Thinking beyond the ESPA programme

As the ESPA programme progresses the Directorate will work with ESPA researchers and users of research to inform thinking on research and development priorities after the ESPA's scheduled conclusion in March 2017. Lessons from ESPA's research will be synthesized and linked with evidence from other relevant research to ensure that ESPA has very significant long-term development and academic impact as detailed in ESPA's [Impact Strategy](#).

The ESPA Directorate welcomes constructive input for further refining the Knowledge Strategy and Research Framework. Comments, suggestions and contributions may come via ad hoc contributions, e.g. through the ESPA website (www.espa.ac.uk) or more formal, structured contributions in the form of published or unpublished research papers.

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