The UK government’s 25 Year Environment Plan (YEP) and the proposed changes to how agriculture and the rural environment will be supported have implications for future policy design, implementation (especially compliance monitoring, regulation and enforcement) and evaluation. With specific reference to soils it has been proposed that farmers will be rewarded following the implementation of an Environmental Land Management System (ELMS). The reason to support and reward the sustainable management of soils is because soil quality is being lost due to poor agricultural practices.

**Regulation of Soil Management Requirements**

In the context of soils any policy that is introduced will first need to define the minimum requirements expected of farmers and land users - i.e. a duty of care. This minimum requirement, if it is to be enforced, will require that any breaches that are detected are subject to some form of penalty. Thus, regulation here could refer to the application of the *polluter pays principle* (PPP).

**Compliance with Soil Management Requirements**

The next aspect of policy and the element that has attracted most attention relates to the provision of increased soil quality. It has been argued that there are public goods benefits that will stem from this outcome and as such farmers should be rewarded for achieving these outcomes. In this case what is being proposed is an application of the *provider gets principle* (PGP).

**Soil Quality Provision and Policy Design**

With the introduction of payments for the provision of improvements in soil quality, agricultural policy as implemented via an ELMS is essentially redefining what has typically been referred to as agri-environmental policy (AEP). In this context, if a farmer is being offered an incentive for enhanced management (i.e. improvements in soil quality) then regulation in this context means compliance with the terms of a supply contract. By understanding the delivery of public goods as a contract between buyer (the government) and provider (a farmer) we can start to understand how policy will need to be framed, designed and evaluated.
There are 6 stages:

Stage 1: Identification of societal preferences, policy goals and objectives
Stage 2: Identification of participants conditional on the goals and objectives of policy
Stage 3: Specification of the type of incentive mechanism to be used – individual negotiation, standard contract or specific contract based on information elicited prior to the introduction of the contract via an auction
Stage 4: Compliance monitoring and enforcement regime
Stage 5: Contract and policy duration
Stage 6: Post-policy evaluation

Stages 1 and 2 are typically determined before the specific issue of policy design is considered as they fall within the domains of political economy and scientific recommendation. The policy design components as they relate to soil are covered by stages 3, 4 and 5. These stages will need to be considered simultaneously. Stage 6 is required to assess if the policy has achieved the goals and objectives stated. Given the focus of this note we will focus on stages 3 and 4.

Stage 3: Incentive Mechanism of Choice

As in any contract how the terms of reward are organised with a supply contact can differ depending on context and goods or services being provided. Firstly, the payments could be based on management activities (inputs) or, alternatively, on some measure of change in soil quality (output). The specific form of incentive payment could be a fixed quantity, it could be negotiated at the individual level or it could be derived as a result of some sort of procurement auction. All these approaches have been used with AEP and have also been the subject of policy pilot schemes via the market-based instruments (MBIs) policy.

Stage 4: Compliance Monitoring

There is an extensive literature on how economic agents respond to contracts. Many of the problems that emerge stem from information asymmetries: either adverse selection or moral hazard.

In the case of adverse selection, the provider - who in this case will be a farmer - (also called the agent) will know more about their own characteristics than the buyer - in this case the government (also referred to as the principal). For example, a contract can be subject to problems of adverse selection, i.e. a farmer secures an inappropriate contract.

However, what matters more in terms of compliance monitoring is moral hazard. This is the situation in which the farmer may take actions that are unobserved by the government which can lead to the contract requirements (i.e. the terms of the ELMS) not being satisfied. The decision to
behave in this manner stems from the way in which the risk of being detected is evaluated relative to the likely penalty.

In practice developing a compliance monitoring regime will be complicated, especially with regard to soils. Some key issues that are well known are as follows:

I. The costs of compliance monitoring are non-decreasing as policy objectives become more complicated. There is a trade-off to be made between policy objectives and practical policy compliance monitoring. Sophisticated environmental objectives may yield significant benefits, but more effort will need to go into compliance monitoring.

II. If we require higher levels of accuracy of compliance monitoring this will only be achieved at increasing rates of cost. So zero levels of non-compliance are not a sensible policy target.

III. The practical aspects of compliance monitoring are likely to inform what the best options are in terms of evaluating policy delivery, e.g. inputs or outputs

Efforts to make compliance monitoring more effective can include targeting of scarce resources at particular groups of farmers. The targeting could be implemented based on soil types, farmer characteristics or other such measures.

From a practical point of view compliance monitoring will be implemented by making farm visits, using land-mapping technology (Geographical Information Systems), and inspecting the financial records of farmers. Duration and frequency of visits also needs to be determined.

Some Further Observations

There is an array of additional issues that complicate any form of compliance monitoring, namely:

I. Clarity of objectives;

II. Farmer ability or knowledge of required practices in order to meet policy requirements;

III. The regulatory style – should policy implementation avoid excessive coercion and instead be flexible?

IV. How long should payments continue for – 2, 5 or 10 years?

V. Farmer motivation – as either active or passive adopters of appropriate practices; and

VI. Social norms may well dictate that farmers change their soil management practices without the need for financial incentives

Concluding Comments

There is nothing unique about how the delivery of soil quality via the ELMS will need to be monitored. We have plenty of experience of designing and evaluating AEP over the last 30 years. However, what is key to this is clarity regarding what is meant by soil quality and the agreed set of metrics to be used; and how these will be implemented “in the field” so as to allow this policy proposal to work.

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