

The economic dimensions of integrating flood management and agri-environment through washland creation: A case from Somerset, England

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Abstract

In many river floodplains in the UK, there has been a long history of flood defence, land reclamation and water regime management for farming. In recent years, however, changing European and national policies with respect to farming, environment and flood management are encouraging a re-appraisal of land use in rural areas. In particular, there is scope to develop, through the use of appropriate promotional mechanisms, washland areas, which will simultaneously accommodate winter inundation, support extensive farming methods, deliver environmental benefits, and do this in a way which can underpin the rural economy. This paper explores the likely economic impacts of the development of flood storage and washland creation. In doing so, consideration is given to feasibility of this type of development, the environmental implications for a variety of habitats and species, and the financial and institutional mechanisms required to achieve implementation.

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1. Introduction

Flood defence for farmland has for many years been an important element of Britain's production-oriented agricultural policy. Many floodplain areas benefited from publicly funded flood defence and land drainage schemes, which reduced crop damage and facilitated a change to more intensive farming systems. In recent years, however, the limits of these floodplains have been demonstrated by fluvial floods during the winter months (English Nature, 2001a). Further, the move towards decoupling under the MacSharry and Agenda 2000 reforms of the EU Common Agricultural Policy (CAP), and the more recent introduc-

tion of the single payment scheme (Defra, 2004a, b) and cross-compliance (Defra, 2004c), has meant that current policy emphasis is directed towards environmental enhancement and diversity of economic activity, with a diversion of funds away from support for farm outputs.

This has encouraged a re-appraisal of land use in rural areas encompassing farming, environment and flood management, including an examination of the scope for the positive creation of flood storage facilities (Morris et al., 2004a). These could provide relief to areas presently subject to unacceptable flooding, reduce the need for expensive flood defence measures elsewhere in the catchment, help the management of scarce freshwater resources, provide wildlife and amenity benefits and, through credits for flood storage and extensive farming methods, provide alternative sources of income to land managers.

Washlands, which are flood storage areas used during times of high flow to reduce flooding in other parts of the

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catchment (English Nature, 2001a), are one mechanism for flood defence and management (Environment Agency, 2002). For the purpose here, a washland is defined as an area of the natural floodplain that is allowed to flood or is deliberately flooded by a river or stream for flood management purposes, simultaneously providing potential for a wetland habitat (Morris et al., 2002, 2004b). Wetlands, as defined by the Ramsar Convention (Article 1.1), encompass a wider variety of habitats. In line with the Ramsar definition, Barbier et al. (1997) define five broad wetland systems, of which riverine—land periodically inundated by river over-topping—is one and closest to the washland concept.

In addition, to their potential contribution to commitments in the Ramsar Convention, washlands may also have a role in the context of the Water Framework Directive (WFD) and 1994 UK Biodiversity Action Plan (BAP) targets. The WFD (Directive 2000/60/EC) has a requirement for an integrated approach to water management at the catchment level. This may present opportunities to improve the management of flood risk through washland creation. Washlands also provide real opportunities to enhance biodiversity and thus contribute to meeting UK BAP targets (Detr, 1995). Floodplains contain several important habitats, including grazing marshes, fens and reedbeds, and the landscape, wildlife and/or historic interest can be of national, if not international, importance (Joyce and Wade, 1998; Wilson et al., 2004).

The environmental importance of floodplains within the UK has long been recognised with the establishment of a number of floodplain environmentally sensitive areas (ESAs) under agri-environment policy (English Nature, 2000; Defra, 2002). In addition, the recent review of UK strategy for the management of flood risk, aptly entitled *Making Space for Water* (Defra, 2004d), identifies a clear role for land management in general and washlands, which integrate habitat and flood management in particular. Finally, the launch of environmental stewardship (Defra, 2005a, b), replacing existing schemes such as countryside stewardship (Defra, 2003a) and ESAs, includes objectives, primarily under higher level stewardship, for flood management, specifically, ‘to provide additional flood water storage and flood defence through the restoration and recreation of wetland habitat for other objectives’ (Defra, 2003b).

The remainder of this paper, using a study of the mid and lower Parrett catchment within the Somerset Levels and Moors ESA in south west England (Morris et al., 2002), explores how public funds might be used more effectively to improve flood risk management through the appropriate use of agricultural land in ways, which reduce the adverse effects of unwanted flooding and simultaneously exploit the beneficial opportunities that managed storage of flood waters would bring. The feasibility of washland creation and potential environmental benefits are considered, before focusing on the impacts of washland creation and the financial and institutional mechanisms

required to achieve implementation. In this respect, the paper provides an example of the opportunities that exist for ‘joining-up’ policy regimes and funding mechanisms regarding farm income support, nature conservation, flood risk and water resources management, especially during this period of considerable policy reform.

2. Feasibility of washland creation

Catchments can be classified into a number of zones, which vary in terms of topography, hydraulic characteristics and potential contribution to flood storage management. Within this there may be a number of options including temporary storage and managed evacuation of water in the lower levels and holding back potential flood waters in the middle catchment.

The suitability of potential sites for washland creation depends on a large number of factors: technical, economic, environmental and social. Hydraulic potential should be the initial selection criterion, followed by other criteria which reflect opportunity for environmental enhancement and likely social and economic impacts.

In the Parrett catchment, criteria for screening site selection for storage were developed and applied (Morris et al., 2002, 2004b). These were hydraulic suitability (ease of filling, evacuation and containment) existing flooding regimes, opportunity for environmental enhancement, suitability of land use, and site constraints such as that imposed by settlements and infrastructure.

3. Opportunities for environmental enhancement in floodplain areas

Just as commercial agriculture requires suitable water regimes, so do environmental and ecological characteristics and processes. The water regime requirements of features of the natural environment can be defined in terms of inundation and groundwater levels and these vary amongst species and habitats during the course of the year.

The main conservation objectives in the Somerset Levels and Moors concern wintering wildfowl, breeding waders, rare aquatic invertebrates and diverse aquatic plant communities, species-rich lowland wet grassland features, and the wider wetland. These objectives are pursued through the designation of Special Protected Area status, Ramsar and SSSI sites, and the Natural Area Biodiversity Action Plan (English Nature, 2001b). In that these objectives require management of water regimes, with respect to both flooding and groundwater levels, they can be met through judicious management of flood storage areas and washlands.

Fig. 1 illustrates the variation in water regime requirements, measured in terms of depth of the water table level from the surface, for selected environmental characteristics during the calendar year. The gap in the diagram which runs through the year shows the minimum and maximum

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