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Surveys

# Social capital and willingness-to-pay for coastal defences in south-east England

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ABSTRACT

Globally, it is widely acknowledged that constructing hard engineered coastal defences is both financially and environmentally unsustainable. Here we seek to investigate the willingness of residents in rapidly eroding coastal zones to contribute towards the costs of constructing and maintaining such structures. The originality of this paper is that it provides one of the first analyses of the influence of social capital parameters (social trust, institutional trust, social reciprocity and social networks) on respondents' willingness to pay (WTP). Fieldwork for the study was conducted in Romney Marsh, a low-lying coastal area of south-east England. The findings have substantive public policy implications for coastal management. First is that we demonstrate that while social and institutional trust exerts a positive influence on WTP, the presence of social networks militates against WTP. Secondly while the study found 45.6% of respondents were willing to pay an average monthly premium of £3.53, a high level of refusal to pay was evident among respondents. Thirdly even among those respondents willing to pay, disagreement was expressed over the political–administrative level at which a 'coastal defence tax' should be collected.



## 1. Introduction: The Role of Social Capital in Willingness to Pay for Coastal Defences

Globally, existing practice for coastal management has been to build new or to raise existing hard engineered defences to protect local communities from sea level rise and erosion. In England, hard engineered defences are mainly funded by central government through indirect taxation. However, despite significant recent real-term increases in public expenditure on flood and coastal defences, and the announcement of a new programme of capital works to be completed during 2015–2021 in England and Wales, many central and local authorities cannot find the necessary funds to maintain existing coastal defences needed to protect local communities from flooding and erosion (O'Connor et al., 2010; Schmidt et al., 2013). Annual flooding costs in England are in the region of £1.1 billion; these could rise to as much as £27 billion by 2080 for the UK as a whole (Environment Agency, 2013). Indeed, it has been estimated that just to maintain current levels of flood defence would require spending to increase to over £1 billion per year by 2035 (Environment Agency, 2013).

One possible solution could be a hypothecated tax which would fund maintenance and construction of coastal defences, paid by residents of affected communities to supplement national spending on coastal defence infrastructure. This is already under discussion in west Norfolk, although so far no action has been taken (Borough Council of King's Lynn and West Norfolk, 2011). Although local taxes or levies may become increasingly important in future, this topic is significantly under-researched. A few studies for example have sought to evaluate citizens' willingness to pay in relation to climate mitigation and adaptation measures (Longo et al., 2012; Solomon and Johnson, 2009; Zhai and Suzuki, 2009), or to reduce risks from climate change (Veronesi et al., 2014). Furthermore, only one study so far has attempted to gauge how much residents would be willing to pay in order to maintain or reinstate coastal defences in rapidly eroding areas (Landry et al's., 2011 study in the U.S.). To address this significant gap in research, the first question we address here is: *how much are citizens in coastal communities willing to pay in order to maintain coastal defences?* We consider this question to be extremely timely given the increasing impacts globally of climate change at the coast, and the difficulties facing public authorities in funding the maintenance and enhancement of coastal defences.

A second question the paper examines concerns the factors that affect residents' WTP. There is a vast literature focusing on different issues that may affect WTP for natural resource management (see for example Mitchell and Carson, 1989; Yao et al., 2014; Breffle et al., 2015). Recently however, increasing emphasis has been placed on the

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role of social capital in shaping local adaptation and mitigation strategies for climate change in particular (Jones and Clark, 2013; Wolf et al., 2010; Lorenzoni et al., 2007). Building on this work, here we analyse for the first time how *social capital influences individuals' WTP for maintaining coastal defences as a means of addressing adverse effects of climate change*.

Before analysing the links between social capital and WTP, it is important to briefly outline the wider context in which 'social capital' has become so popular. Social capital was initially conceptualised by Bourdieu as having significant impacts for individuals' economic and cultural capital (Bourdieu, 1986). Putnam et al. (1993), Coleman (1990) and Portes (1998, 2000) took this work further and analysed how social capital can have multiple benefits at individual and collective level, while also entailing risks, especially when it is developed in closed social groups. Social capital can characterize a community as a whole (Putnam et al., 1993) and can be developed collectively, thereby influencing individual social capital (Coleman, 1990). In this paper we focus on social capital at this individual level, but our analysis also considers the fact that certain parameters of social capital can influence interpersonal relationships and collective activities across whole communities (Putnam et al., 1993; Coleman, 1990; Gui and Sugden, 2005).

We focus here on four social capital parameters: social trust, institutional trust, social networks and social reciprocity (Putnam, 2000; Jones et al., 2011; Woolcock and Narayan, 2000). It is proposed that higher levels of social capital lead to greater community resilience to extreme natural events (Munasinghe, 2007), and moreover that social capital has a significant impact on communities' responsiveness to environmental policies (Jones and Clark, 2013). Related research has established relationships between social capital and WTP for environmental policy initiatives, based on the level of citizens' monetary contributions (Halkos and Jones, 2012; Jones et al., 2011).

When looking at each social capital parameter, *social trust* refers to trust towards other people (Uslaner and Conley, 2003). It has been related to natural resource management because of the positive effect it may have on individuals' perceptions of the environmental capacities of fellow citizens (Wagner and Fernandez-Gimenez, 2008). Thus, it is expected that individuals with higher levels of social trust will view more positively the principle of paying for an environmental policy goal due to their belief that other community members will also act collectively, and will similarly be prepared in practice to pay towards the costs of the proposed policy (Jones et al., 2011; Polyzou et al., 2011; Wiser, 2007). Likewise, in communities where a sense of reciprocity is well developed among individuals, it is more likely that community members will act together for 'the common good' (Pretty, 2003). Consequently, a positive influence on WTP can be expected in communities where strong social reciprocity that is supportive of environmental values is promoted (Halkos and Jones, 2012; Polyzou et al., 2011).

*Trust in public institutions* is also expected to have a significant impact on WTP. Existing studies demonstrate that both the intention and WTP of individuals are significantly determined by the level of trust in the proposed management body, or the public authority that will manage the payment vehicle (Krystallis and Chryssohoidis, 2005; Meyerhoff and Liebe, 2006; Whitehead and Cherry, 2007). Consequently institutional trust has been positively related with the financial contribution of individuals to climate change policies (Glenk and Fischer, 2010). So it is expected that in communities with individuals who trust public institutions, there will be a greater willingness to pay due to a shared community belief that the management body will be effective, and will use monies prudently and appropriately.

Finally, there are *different types of networks* that have a significant impact on the wider socio-economic sphere both at an interpersonal and at a community level (Gui and Sugden, 2005). Thus it has been suggested that under certain circumstances 'mobilization' around collective issues can be increased (Uhlaner, 1989). A number of studies now confirm that greater networked interaction leads to increased environmental awareness among individuals, making communities more responsive to natural resource management issues (Wakefield et al., 2006; Cramb, 2005). Recent studies (Yao et al., 2014) have shown that people who are members of environmental NGOs are also more willing to pay for natural resource management measures. This is because environmental NGOs tend to raise awareness of headline issues, such as climate change impacts, and this increased environmental awareness can lead to a higher WTP contribution (Polyzou et al., 2011).

Nonetheless, although the majority of studies focus on the positive impacts of social capital, there are cases where the influence of social capital is negligible or can even be negative under certain conditions (Portes, 2000; Levi, 1996). In environmental issues, for example, there may be communities where established social norms do not promote collective action at individual level (Jones et al., 2011). Moreover the influence of networks will significantly depend on the type of social interaction developed locally, and whether information circulated pertains to and is beneficial for natural resources management (Jones and Clark, 2013; Wolf et al., 2010). Consequently individual social capital should always be analysed in relation to its collective social and cultural setting.

## 2. Methods

### 2.1. The Study Area

The research was based on a survey conducted via structured questionnaire of coastal communities in Romney Marsh in south-east England in 2012. Romney Marsh covers 260 $km^2$ and is sparsely populated, with approximately 22,000 households in the coastal zone. The main reason for selecting the Romney area was because it already experiences climate change impacts which are expected to increase significantly in future (Shoreline Management Plan, South Foreland to Beachy Head, 2006). The Marsh is reclaimed from the sea with the majority of land being below sea level. Consequently a flooding incident anywhere along the coast could potentially result in widespread inundation of the area. For this reason, extensive coastal defences have been built. The current management plan proposes to continue maintaining these defences. However, in order to underwrite the cost of their maintenance and to provide a contingency reserve to construct new defences in the future, there is now a requirement to find alternative means of funding.

### 2.2. Distribution of Questionnaires

The study's total sampling frame was calculated after including all communities which were in the 'high risk flooding zone' proposed by the Environment Agency. The local postal code index was used and a sample of 1,000 households was selected during May–June 2012, with a random sampling technique (every 22nd household in the total sampling frame was selected). Questionnaires were sent by post, with participant households receiving a covering letter explaining the aims of the study, the structured questionnaire and a pre-paid envelope. The covering letter invited one household member to fill in the questionnaire (respondents needed to be aged 18 years or over). The response rate was 16% which although low is comparable with similar studies (e.g., Whitmarsh, 2011). We therefore considered the survey results to give a clear indication of residents' attitudes regarding the two research questions. Table 1 shows the main demographic characteristics of the sample.

### 2.3. Description of Questionnaire

The questionnaire was designed to elicit respondents' perceptions of climate change projections, their opinion of coastal