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Positive externalities, knowledge exchange and corporate farm extension services; a case study on creating shared value in a water scarce area

Colm Bowe [a,*], Dan van der Horst [b]

[a] Liverpool John Moores University Natural Sciences and Psychology, James Parsons Building, Byrom Street, Liverpool L3 3AF, UK
[b] University of Edinburgh, UK

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ABSTRACT

Despite much rhetoric about the 'greening business' agenda and various initiatives to promote the valuation of ecosystem services and natural capital, the corporate sector has been slow to integrate social and environmental factors into core business models and to extend this integration across their supply chain. Our effort to narrow this thematic and methodological gap focuses on the co-benefits and positive externalities that can be generated through progressive knowledge exchange between a corporation and its suppliers. Using a case study of contract farming of malting barley in water scarce Rajasthan (India), we examine the extent to which best practice agronomic advice given by corporate farm extension workers can help small scale farmers (suppliers) to increase income, improve resource efficiency (water, fertiliser, energy) and reduce greenhouse gas emissions. Findings from our desk study suggest positive results for all these variables, when compared to the regional benchmark of non-participating farmers. Under a scenario where advice is provided on all major crops (not just barley), we find a significant further increase of farm income. Our valuation of the reduced exploitation of ground water (alone) exceeds the advisors' annual salaries, suggesting that under full social and environmental accounting, the extension services are not a cost factor, but a profit making unit of the company. We discuss of our findings in relation to alternative approaches to PES and alternative investment strategies in green technologies.

1. Introduction

There is a growing effort to involve businesses in the protection of the natural environment and the world's ecosystems, from grand declarations (e.g. the UN 'Natural Capital Declaration'-Mulder et al., 2013) to more practical reports focusing on the quantification and valuation of externalities produced by businesses and the ecosystem services which underpin business performance (World Business Council for Sustainable Development, 2011; TRUCOST and TEEB for Business Coalition, 2013). A company creates externalities when it undertakes activities that bring costs or benefits to unsuspecting third parties. Environmental externalities often relate to impacts on public goods such as clean air or fresh water resources.

Businesses wishing to account for, manage and plan their environmental and social impacts can face a number of challenges, from the lack of established assessment methods to problems along the supply chain where they can exert only partial influence on the behaviour of their suppliers and customers. The nature of relationships along the supply chain has been a focus of media, advocacy and academic attention, showing how a company's brand value can be damaged by revelations about the poor practices of their suppliers (e.g. child labour, environmental pollution, (see Lund-Thomsen and Nadvi, 2010) but also how good environmental and social practices can be promoted amongst suppliers through a pro-active and supportive approach by the larger company that buys their products (e.g. Walton et al., 1998). This paper examines a particular kind of supply chain relationship; between a large company and the many individual farmers supplying its feedstock. Amongst supply chain relations, this particular relationship stands out for the size differential, i.e. a one big buyer with thousands of small suppliers. It also stands out for the fact that farms are not simply businesses; they are families and communities, rooted in a particular agro-ecological landscape and rural culture. The size differential means that companies can have huge leverage on farmers, dictating contracting arrangements that shape farming strategies and thus impact on the rural landscape and the ecosystem services it provides. This leverage may increase

* Corresponding author.
E-mail addresses: c.bowe@ljmu.ac.uk (C. Bowe), dan.vanderhorst@ed.ac.uk (D.v. der Horst).

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even further in a developing country context, where farmers tend to have less access to capital, to agronomic advice and (due to poor infrastructure) to different markets and alternative buyers (e.g. Galt, 2007; Porter and Philips-Howard, 1997). Some critical authors have argued that these contract farming arrangements are exposing farmers to new risks, or are causing an unequal distribution of risks and the subordination of farmers (e.g. GoldSmith, 1985; Watts, 1990; Clapp, 1994).

A more progressive outlook would suggest that it is in the long-term interest of the company to think more holistically about their relationship with the farmers. For example gaining farmer loyalty can help to ensure security of supply for their regional processing plants despite the arrival of new buyers on the local market; the provision of training and the supply of farming materials can help to ensure high quality feedstock despite disease outbreaks or adverse weather conditions. Porter and Kramer (2011) flag up several recent examples of corporations benefitting by working more closely and more synergistically with farmers and farmer communities; their call for 'creating shared value' could be read as a call for creating positive local externalities through company activities that go beyond short-term gain or a singular focus on the short-term bottom line defined exclusively through traditional financial accounting tools. Known as a leading thinker on business strategy, Michael Porter's ideas are evidently having some influence within the business community (for examples in the agricultural sector, see FSG, 2011; Nestle, 2013). The idea of creating shared value differs from corporate social responsibility in that it seeks to anchor pro-social and pro-environmental corporate behaviour within markets and value propositions, rather than within an 'add-on' narrative of corporate duties and responsibilities. Porter and Kramer list three broad areas where companies should seek to create shared values; (1) rethink products and markets to provide more appropriate services and reach those (poor people) with unmet needs; (2) mitigate risks and improve productivity in the value chain and (3) enable local cluster development, e.g. by supporting suppliers. It is clear that the last two areas can be of direct relevance for contract farming. Also the first area can be relevant for contract farming, in at least two respects. First of all, in developing countries many farmers have unmet information needs, i.e. they require more, better and faster information on technologies, crops, markets, pests or weather in order to make good agronomic and farm management decisions. Secondly, the company's extension workers and logistical operations (e.g. they have empty trucks driving into the countryside to pick up the feedstock) could be seen not just as costs, but as (underutilised) assets that could be deployed for additional business activities, such as the delivery of new and socially beneficial goods and services to remote rural areas[1].

The existing literature on shared value and on the mutual benefits of contract farming is limited in size and is mainly qualitative (Galt, 2007; Porter and Philips-Howard, 1997; Birthal et al., 2008; Porter and Kramer, 2011; Fayet and Vermeulen, 2012; Baumüller et al., 2014; Christiansen, 2014). There is a gap in the literature about the extent to which companies can work progressively with farmers, to reduce the negative environmental externalities of existing farming practices and share the economic benefits of a long term, stable and beneficial interdependence along the supply chain.

In a contribution to narrowing this gap, this paper aims to assess, quantify and value the farming related externalities caused by a company's extension services, using a case study from Rajasthan where small scale farmers were incentivised to start growing malting barley for a company's regional processing plant. It is a case of crop switching on existing agricultural land.

Our paper is structured as follows. In the next section, we provide the business and biophysical context for our case study. We explain the data sources we used and the externalities we have chosen to examine. We develop a set of scenarios which allow us to examine the relative environmental performance of the farmers who grow barley for the company. In the third section we quantify the externalities associated with each scenario. In section four we convert these to monetary values. In section five we discuss the limitations and consequences of our findings, exploring different intervention options to further improve resource efficiency or farmers' incomes. Section six contains our conclusions.

2. Case study background

2.1. Business context

Barley has traditionally been grown in Rajasthan and more widely in northern India as a fodder and feed crop with low input requirements. However over the last 40 years, farmers have shifted from barley towards (higher value) wheat or mustard production (Verma et al., 2010). In 2006 the multinational SABMiller set up the Saanjhi Unnati (Progress through Partnership) project in Rajasthan to develop a local supply chain for barley for their new regional brewery, which would reduce their need to import malting barley from abroad. The company employs 30 agricultural extension workers across Rajasthan who liaise with farmers and sensitize them to the adoption of barley varieties that are more suitable to brewing (notably variety K551, brought in from Uttar Pradesh). Participating farmers receive best practice advice (water management, fertilizer application) to reduce inputs and improve yield. Data was collected by an Indian consultant who was hired by the company to undertake focus group discussions with the extension workers. We obtained the above details and data from discussions with the company, facilitated by the Cambridge Institute for Sustainability Leadership[2].

2.2. Biophysical system

The major crops grown in the Rajasthan region include barley (*Hordeum vulgare* L.), wheat (*Triticum aestivum*), mustard (*Brassica juncea*) and gram (*Cicer arientinum*) grown in the Rabi (winter, dry) season and soybean (*Glycine max*), guar gum (*Cyamopsis tetragonoloba*), bajra millet (*Pennisetum glaucum*) and groundnut (*Arachis hypogaea*) during the Kharif (summer, rainy) season.

This study focuses on the Rabi system and the inputs and outputs produced from this system (table 1); the corresponding ecosystem services and natural capital externalities (table 2). We did not have sufficient data to assess impacts on cultural ecosystem services or on biodiversity. Since this is a case study of crop change on existing fields in an intensely farmed landscape, we anticipate these impacts to be relatively minor. As the study sought to achieve quantification within a business context we focused on externalities where data on inputs and methods to calculate impact/outputs were readily available (Tables 1 and 2), as follows: Water is pumped from wells using diesel and electric pumps, resulting in decline in groundwater reserves and CO_2 production. Inorganic fertilisers (DAP, urea) and organic fertiliser added to the soil result in denitrification of nitrates to N_2O an

[1] For example Dunavant Cotton use their normal logistical operations to supply mosquito nets in rural Zambia, see http://nwkzambia.com/index.php/mosquito-nets/

[2] This was funded by the Natural Environment Research Council (NERC), under the 'Valuing Nature Network' http://www.valuing-nature.net. Apart from the use of data that came from company employees, our study is entirely independent.