



## **SUSTAINABILITY: WHO IS DRIVING IT?**

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## **ABSTRACT**

Sustainability is a multifaceted concept which is presently ubiquitous in modern society. As a result, it is difficult for a more definite definition of what sustainability is as it relies on the fact that such a concept has been socially constructed throughout the twentieth century. A brief description of the milestones around the debate on sustainability until the 2000s attempts to highlight the fact that sustainability, as a social construct, has been evolved in response to social, economic and environmental pressures. Following that, the role of consumers and business will be analysed. The first is analysed from a behavioural consumption perspective where a short literature review has attempted to put into perspective the theoretical elements explaining reasons consumers behave, or not, in a more pro-environmental manner. The latter is analysed from the perspective of businesses actively seeking to improve their sustainability positions in the UK market. It is proposed that businesses, rather than consumers, are the principal stakeholders which act as spearheads enabling transformations in business practices that would enable them to attain higher levels of sustainability gains. Businesses do so in order to satisfy some customers, pressure groups and the government, but in so doing reap advantages such as increased efficiency, reduced cost and consequently higher profits. Cases of large food manufacturers in the UK are described regarding the awareness of such businesses to take their sustainability agenda further. The motivation of such businesses is mainly profit-making, to improve their competitive position in a mature market where growth is marginal through differentiation. However, in operating in such an environment, great demand is put on suppliers which have to comply with the industry's strict standards. Finally, recommendations are made for businesses in emerging markets with an interest in entering the export sector. For businesses in emerging markets, it is of great relevance to understand the food supply chains abroad since the transmission of knowledge, the adhering to standards and the consumers impose challenges that need to be addressed.

**Keywords:** sustainability, pro-environmental behaviour, ethical consumption, supply chain

## 1. INTRODUCTION

The concept of sustainability is not new. A search of the literature demonstrates the topic being discussed from the early decades of the twentieth century onwards. However, a greater awareness about sustainability took shape after World War II, when stronger views about economic development and the environment finally reached a wider audience. That was mainly owed to the realisation that the planet would no longer provide an infinite amount of resources. In addition, the technological advances, despite the increasing gains of efficiency up to that point, would be unable to satisfy the exponential demand for products, especially on those goods which highly depended on non-renewable resources.

Throughout the decades, the debate on sustainability has evolved in leaps and bounds. There have been advances and drawbacks which, to some extent, reflected periods of more or less intensification in the economic activity. However, in the 1960s, a book by the conservationist Rachel Carson served as a wakeup call in western societies. In her book 'The Silent Spring' the author was alarmed to see how food production, highly dependent on an ever increasing use of agrochemicals, had become a matter of concern regarding the impact of residues on the environment, animals and humans. Carson pointed out that the environment could no longer be used as if it were a great rubbish bin, nor be treated as having an endless capacity to absorb pollutants. Along that decade, major oil spills, which had devastating environmental impact on coastal communities which depended on the sea for their livelihoods, acted as catalyst for the need to change.

Since the 1960s, western nations have started to consider the problems associated with the environment, pollution, loss of natural resources and the destruction of key habitats. The Intergovernmental Conference for the Rational use and Conservation of the Biosphere served as a great milestone towards global actions on ecological sustainable development. Moreover, the arrival of the 1970s saw the debate on sustainability take a more activist approach, hence reflecting the trends regarding social trends in western societies. In that decade, the First Earth Day in the USA inspired widespread protests which have also led to the introduction of legislation favouring environmental protection on endangered species as well as the protection of the use of water. In western Europe, many nations had experienced the effect of long-term pollution caused by non-renewable energy sources and the devastating effects of acid rain which reached critical levels. It was time for action.

Nonetheless, in the 1970s, whilst in the industrialised world sustainability issues crept up in the agenda of opinion leaders, politicians and finally the society as a whole; in less industrialised economies, the debate on sustainability might have seemed alien to those societies where the daily struggle for survival was (or maybe still is) the most important aspect of life. There has been a clear dichotomy between how many of the problems experienced had been acted upon in nations where industrialisation was more intensive such as in the USA, Europe and Japan than in those of less industrialised economies. However, in 1973, some dissent was also being felt in rural areas as it was the case of the women of the Chipko tribe in India. The women brought the world attention to their plea by engaging in demonstrations highlighting the way the landscape where they lived was being transformed by intensive deforestation, environmental degradation and, consequently, jeopardising the future of their families' livelihoods. At the end of decade, the report 'Limits to Growth' which linked issues of environmental degradation and sustainability to the explosion of population growth was published. That report alerted the international community to the possibility an old Malthusian adage could be possibly proven. In general terms, the moral philosopher Malthus proposed that population explosion would result in chaos and hunger as there would not be enough resources or food for everyone in the future.

In the late 1970s and throughout the 1980s, a range of international actions towards the control of trans-border effects of pollution in the air, sea and land took effect. On the one hand, the 1980s experienced major environmental disasters such as the toxic leak in Bophal, the nuclear accident in Chernobyl and the Exxon Valdez oil spill. On the other hand, clear transnational actions against the effect of greenhouse emissions, global warming and the problem with the ozone layer being depleted started to be enforced. Towards the end of that decade, the publication of the report 'Our Common Future', more commonly known as 'Brundtland' report after its main author, acted as a milestone for the conceptualising of sustainability.

Following that, the 1990s started with the Rio Earth Summit which served to engage not only diplomats, technocrats and representatives of NGOs, but also the general public in the debate about sustainability. The role of the Internet is pivotal as a major vector to link up communities and spread awareness about sustainability issues. The publication of 'Natural Capitalism' by Hawken et al (1999) pointed to the fact that the world's economy was still based on parameters set out from the time of the

industrial revolution when labour was scarce and natural resources were abundant. The authors also brought to the public's attention the fact that 'natural resources and ecological systems that provided vital life-support services were in decline and becoming expensive'.

The 1990s also saw a growing interest from larger corporations to capitalise on the increasing pro-environmental trend. Industry initiatives, codes of practice and standards have proliferated. These have also required much needed certification to assure consumers that pro-environmental practices were being followed thoroughly. The decade has also been characterised by widespread privatisation of state-owned companies which have also served as platform for a more de-regulated environment for business to operate. Trade liberalisation measures facilitated the circulation of goods which, in essence, enabled the transformations at macro-economic level were propitious for the establishment of a globalised economy. The period is also rich in opportunities for the food supply chain which, following trends in the market has become truly internationalised. The decade ends with the creation of the Dow Jones Global Sustainability Index (DJGSI) which tracks the financial performance of leading sustainability-driven companies. The DJGSI epitomised the value businesses put on sustainable production.

In the 2000s, whilst society experienced the intensification of de-regulation measures, governance-related actions proliferate. Moreover, consumers and consumers' groups established themselves as having a more prominent role as important stakeholders in supply chains. There is no doubt that consumers and consumer groups have provided a further vigour for the drive towards sustainably sourcing and support to the environmental debate. The publication *Landmarks for Sustainability* by Visser as its main editor has captured the spirit of the decade as the author has addressed topics about stakeholders' engagement, corporate social responsibility and social enterprise (Visser, 2009). From the 2000s onwards, the popularity of the fair trade movement has grown because it has also followed a more deliberate commercial strategy. The fair trade movement provided 'a face' for consumers to engage more with food production and by highlighting the inequalities between geographies of production and consumption. The direct link to sources and the 'putting back something' on sites of production has been key in driving such an 'alternative supply chain', in contrast to that of conventional commodity trading. The

2007s see the Nobel Prize being jointly awarded to the International Panel on Climate Change (IPPC) and the north American vice-president Al Gore Jr.

In this article, it is aimed to address issues surrounding sustainability which are relevant for today's professionals, be it in academia or in the management of food chains. As for the objectives, this article, aims at providing a time line of the key events showing the evolution of the debate about sustainability. Often, trends in food consumption appear and evolve, but sometimes their origins get somewhat diluted with time. Hence it was judged important to provide a time-line dimension of the debate up to now. It also attempts to provide a brief review of the literature relevant to consumers on pro-environmental behaviour; to highlight the importance of sustainability-related issues for the industry, and present the UK experience in the food sector from a case perspective. As for methodology, due to the qualitative nature of the enquiry, this research encompasses a literature review on pro-environmental consumption; the food industry perspective on strategies to disseminate sustainable practices, and two case studies are described in order to better illustrate the points made. Finally, conclusions and suggestions are made which would attempt stimulate an agenda for future studies and research on sustainable consumption.

## **2. THE CONSUMERS**

Those who favour sustainable consumption would endorse the efficient use of natural resources, the reduction of waste, the favouring of recycling etc. Consumers, as stakeholders in a supply chain include individuals, government, not-for-profit organisations, NGOs and communities (Beamon, 2008).

However, not all consumers are sustainability-oriented. On the one hand, some argue that consumer-driven sustainability is growing in importance in segments typical of the high value premium markets (Srinivasan, 2009). However, consumer-driven sustainability can embody a range of meanings and, consequently, be perceived and interpreted in many different ways. It is, nonetheless a fact that external consumer concerns have been affecting consumer behaviour in export countries. On the other hand, it is also argued that the consumer-driven sustainability 'revolution' has never materialised. Holtum (2011) mentioned that pro-environment consumers decide about what to consume based on, amongst others, provenance and carbon foot print, but the largest majority does not.

Sustainable consumption, as presently understood, has roots in the Rio Earth Summit in 1992, took prominence in the World Summit for Sustainable Development in Johannesburg and was supported during the Symposium of Sustainable Consumption in Oslo. However, consumption patterns vary considerably around the world. It depends on geography, historic economic development and the overall demographic trend. In spite of consumers in industrialised nations being responsible for the highest carbon footprint of all, these are also responsible for maintaining steady output levels as well as lowering resource use. Thus, consumers in industrialised nations could be considered as more environmentally conscious. Yet, in nations in Southeast Asia and parts of South America, societies are leapfrogging into sustainable structures of consumption and production (WBCSD, 2008), consequently advancing fast regarding a more environmentally-related behaviour.

The future prospects about global consumption are generally good. There is a trend for rapid population growth in the coming decades which will boost GDP accumulation especially in the emerging markets. Such a growth will be supported by a strong affluent middle class which has been exposed to a long culture of consumerism. Yet, some agricultural scientists have been revisiting some old Malthusian principles in order to alert the population to the fact that the pillars of a globalised consumer-based society are not sustainable. Something has to be done.

The World Wide Fund for Nature (WWF) has estimated that consumers in high income countries accounted for the greatest per capita environmental footprint (WWF, 2006). The WWF has also estimated that food and drink production alone have the highest ecological impact for each US dollar spent. For every US\$ 1 million spent on food, the carbon foot print would be equivalent to 1,500 hectares. Nevertheless, the World Business Council for Sustainable Development (WBCSD) stated that ‘businesses can foster more sustainable levels of production and patterns of consumption’. This means that businesses have perceived, according to the Council, that there is ‘a significant opportunity to help consumers choose and use their goods and services more sustainably’. This is an interesting statement but also evidence that the development of sustainable supply chains could be considered as still much too focused from a production-orientation perspective. This might be so because much of the research has been concentrated on the environmental impact at the manufacturing level. Yet, it is known that some 80% of the overall environmental impact caused

would actually take place both during and after the act of consumption (WBCSD, 2008).

Almost all large food processors and retailers provide on their websites mission statements on sustainability, their engagement, actions and strategies. Despite this, sustainable consumption is not at all that clear. If taken into account the overall realm of consumption, sustainable consumption itself is still considered a niche. Nevertheless, such a niche is also unique due to it being very diverse. The plurality in respect of sustainable consumerism could be expressed through end-products or processes that embody a range of denominations such as organic, local, green, natural, free range, 'free from' etc. In recent decades, in spite of the increasing consumers' attitude towards more sustainable production and, consequently, the increasing supply of such products, it is difficult to explain an overall consumers' attitude favouring more environmentally-produced goods. In principle, sustainable consumption is supported by many consumers. However, when at the act of shopping for food, consumers quite often opt for other attributes such as price, quality and convenience. As a result, there seems to be a gap between consumers' attitude and behaviour. Understanding and narrowing such a gap is considered important for the fostering of a more sustainable consumption as consumers ought, not only to support it in principle, but also in practice.

Sustainable consumption depends heavily on 'reflexive consumers who, not necessarily, are social activists' (Kollmuss and Agyeman, 2002). Social activists are those who would require far more information about the source of a product in order to make their own assessment of the product they are buying. This type of reflexive consumerism embodies issues such as the environment, human rights, labour and animal welfare. In this sense, 'reflexive consumers' would like to have 'fully traceable products with something else'. However, consumers who do not actually turn expressed interest into purchasing habits are many.

Despite the growth in sales of sustainably produced goods, the gap between attitudes and buying practice is wide. According to a study by De Pelsmacker et al. (2003), consumers who were interested in buying 'earth-sustainable' products did not purchase them because of a perceived lack of availability, inconvenience and price. Vermeir and Verbeke (2006) found that this still very much hold true as more sustainable and ethical food consumption could be stimulated by improving involvement, perceived availability, peer pressure and perceived consumer



effectiveness. Nonetheless, De Pelsmacker et al. (2003) evidenced that decisions about grocery shopping were found to be ‘unashamedly selfish’. Groceries shopping decisions, rather than being driven by altruistic motives, have actually been determined by price, convenience and value (FSA, 2007).

In recent market surveys, consumers’ attitudes in more developed markets show that the awareness of the environment and social issues has become mainstream. Whilst in the UK, 18% of consumers could be considered as ‘Positive Greens’, in continental Europe the trend would be that consumers are more willing to act on environmental concerns. (WBCSD, 2008). In some European countries, sustainable sourcing is taken as a given in products when purchased from supermarkets. Consequently, in industrialised societies, food processors and retailers ought to be guaranteeing that the food on display has followed the most strict codes and manufacturing practices.

There are several factors that affect decision regarding what consumers make when choosing which product to buy. Many theories have attempted to outline the reasons of this gap between consumer intention and decision. Burgess et al (1998), when developing a seminal work on anti-litter behaviour, proposed a linear model where knowledge led to a certain attitude, which in turn led to a positive behaviour. Other researchers have tried to explain the ‘gap’ in more detail. Rajecki (1982) proposed causes for pro-environmental behaviour as being related to experience, influence, time and attitude-behaviour measurement. Rajecki (1982) believed that people's attitudes changed depending on the distance in time from the main motivator driving the expected action. As a result, in order to keep positive attitude towards sustainable consumption behaviour fresh messages need to be constantly re-enforced in the mind of the consumers. Yet, Ajzen and Fishbein (1980) considered that people were essentially rational and ‘would make systematic use of the information available to them’ when they published the Theory of Reasoned Action. Hines et al. (1987) built on this idea when proposing a ‘Model of Responsible Environmental Behaviour’. Nevertheless, Grob (1991) disagreed that knowledge about one cause would lead directly to action.

In addition, not only internal but also external factors would also affect why a person choose certain actions. Motivations are a strong internal stimulus, around which behaviour was organised. Stern et al. (1993) stated that people felt three types of altruistic orientations: social, egoistic and biospheric. Social orientation was about

removing suffering from others; egoistic orientation was about looking after oneself, and biospheric orientation was owed to caring for the non-human world. Acting guided by a social, egoistic and biospheric altruism explains the consumers' attitudes towards, for example, Fair trade as during the act of consumption the three orientations could be fulfilled. Yet, Stern et al. (1993) proposed that consumers who possessed these three motivations, but used them in different strengths. Hines et al. (1987) and Stern et al. (1993) theories could explain why some people cared more about certain issues than others. The theories were also useful in the understanding that not all decisions made by humans were rational, and based on information available.

Indubitably, consumers are increasingly concerned about environmental, social and economic issues, and increasingly willing to act on those concerns. Until recently, much of the platform for action on sustainability has been provided by consumer groups and NGOs. It is important to understand that sustainable consumption is still very much an aspect of active engagement by the part of the individual. As seen before, consumer willingness often does not translate into sustainable consumer behaviour because of a variety of factors: such as availability, affordability, convenience, product performance, conflicting priorities, scepticism and force of habit. In the 1980s and 1990s, ethical consumption strongly relied on altruistic behaviour. When behaviour change was promoted, it denoted intense altruistic behaviour in statements such as 'to make a change' where the charitable notion 'to help the other' and 'to help the planet' was the main drive. This is not in line with what De Pelsmacker et al. (2003) mentioned about 'unashamedly selfish' behaviour by consumers, and hence, poses a problem. As seen before, the majority of groceries shopping decisions were determined by price, convenience and value (FSA, 2007). In a recent survey, ethical issues came fifth in importance after ingredients, quality, country of origin and price when consumers were observed shopping (Global Entrepreneurship Monitor, 2011). Furthermore, according to Line (2011), the discrepancy between intention and action is great and has varied greatly according to the different continents. Consumers willing to 'make the world a better place' or 'make a change' might be following a more 'evangelical behaviour' which is not typical to rational or pro-environmental behaviour as demonstrated above.

Despite all the theories, none can actually explain the 'gap' between the support of the ethical issues and regular ethical consumerism. Chawla (1998) suggested that values shaped most of one's motivation in what made people support certain causes, in this case, environmentalism. But crucially, many people's attitudes were shaped before they were conscious of making decisions. Blake (1999) pointed out that most of the analysis made about consumer behaviour was limited, because they failed to take into account individual, social and institutional constraints. Blake (1999) also identified several barriers between concern about an environmental issue and action, which consisted of individuality, responsibility and practicality and how these attitudes inter-acted which other were especially important for people with no strong social or ecological concerns. Since major barriers could be stopping consumers buying ethical products, the 'responsibility' barrier, which relates to trust would, then, become a barrier between concern and action.

Kollmuss and Agyeman (2002) proposed a model of pro-environmental behaviour exploring the gap between intention and action in the consumer spending habits. The model builds upon many of the previously proposed ideas in describing the reasons for this 'gap', mainly on Fietkau and Kessle (1981) and Fliegenschnee and Schelakovsky (1998) cited by Kollmus and Agyeman (2002). They considered emotional involvement as a factor for linking environmental knowledge, values and attitudes to pro-environmental behaviour. They called this 'pro-environmental consciousness', which was derived from personal values, shaped by personality traits and affected by internal and external factors, including here social and cultural ones. Kollmus and Agyeman (2002) suggested that expected responses would vary according to different personal life stages as well as, for example, the extent of education or knowledge about environmental issues. As for other possible barriers to behaviour, it identified old behaviour as the worst. This is because old behaviour limited all possible attributes deriving from both internal and external factors that determine environmental consciousness. Kollmuss and Agyeman (2002) pointed out it was almost impossible to create a model that fully explained the gap between intention and action which incorporated all the factors discussed as it would be far too complicated. The model is not complete in itself as it has, for example, omitted gender and years of education as these are regarded important factors when considering how pro-environmental conscious a person might be.

Carrington et al. (2010) published an interesting article on the reasons ethical consumers 'do not walk their talk'. The authors argue that consumers do actually intend to consume more ethically, however, they are hampered by constraints and competing demands for other goods before they reach at the checkout. As a result, consumers 'forget' to consume more ethically. In Line's (2011) survey, most consumers' priorities related to family, leisure, status, community, work, health and money. The environment was not a core priority for consumers but can be a supporting factor for core priorities.

### **3. THE INDUSTRY**

Food is the most basic of all human needs and agriculture is and will remain the most ubiquitous and important human activity. Definitions of sustainable agriculture have generally emphasized the requirement for agricultural practices to be productive to meet human needs for food, to be economically viable for producers, to be environmentally safe, and to be sensitive to the quality of life of farming societies (Raman, 2006). In spite of the many arguments pro and against the notion of sustainability, the clarity of the concept has become a casualty on account of the delicate balances that need to be maintained among the factors impacting sustainability. Whilst the agronomists think of productivity; the economists think of price; the sociologists of social equity; policymakers of facilitation of rules and regulations; activists of confrontation and food processors of profit.

The reductionist view of sustainability is that the permanence of any activity is primarily a matter of resource availability (Raman, 2006). It denotes a balance between supply and demand. When the resources become limited or demand outstrips resources, there is a threat to sustainability. Technology which has so far waved a magic wand to exhort more and more from natural resources may become less effective because it is only complementary but not substitute to natural resources. This is exactly what geneticists working with wheat have struggled with the past decades. Miraculous yield gains are not likely to happen in the near future. GMO technology, on the one hand constrained by legislation within the EU but also on the radar of consumer groups, is not suitable in the case of wheat improvements. Barnes and McVittie (2008) in their article 'Measuring the Sustainability of the UK Food Chain' mentioned that it is important to consider productivity measures, alongside key indicators of resource quality trends as an indicative for sustainable growth.

Retailers when competing for high value premium market share tend to increase and put further specific requirements regarding market assurance schemes. Retailers and major corporations do so for different reasons. As seen from Holtum (2011), many corporations willing to help consumers towards a more sustainable consumption do not do so for any great altruistic reason. Fabbe-Costes et al. (2010) mentioned that companies in the process of becoming more sustainable need to constantly scan the market. Companies are faced with many uncertainties and market complexities. Changes in logistics, supply chain management, storage conditions and inventory control have resulted in changes in consumer demand. Furthermore, a move towards becoming more sustainable can also help with profit maximization. There are clear gains from reducing water usage, re-utilizing green gas emissions and saving more energy. As a result companies can maximize profitability and remain sustainably competitive.

Beamon (2008) introduced the notion that supply chain management was entering an age of unprecedented opportunities. It is recognized that the largest impact of consumption is not during the manufacturing stage of production, but after it has been used at house-hold level. Hence, supply chains which have up to now operated under relatively inexpensive energy and raw materials have been alerted to the fact that they are also responsible for the reduction of the volume of postconsumer materials which would end up in land fills. If manufacturers need the consumer market to keep expanding, Hultom (2011) mentioned that processors needed to encourage consumers to reduce their own emissions. For example, much present emphasis is now being focused on product life cycle. Hultom proposed that the modern supply chain will have to consider the lifecycle of a product beyond its traditional end-of-life. The industry, according to Schultmann et al. (2006) cited by Beamon (2008) would be interested in the post-lifecycle phase of a product due to legal and profit motivations. However, the number of consumers willing to change their behaviour is stuck at around 20% of the market. In order to shift the other 80%, companies need to think about how to help change overall consumer behaviour (Holtum, 2011).

After all, being more green and off-setting carbon foot print through farming techniques that would better manage the use of natural resources, preserve biodiversity and improve soil fertility is certainly welcome. The triple bottom line approach to sustainability has helped the industry to find other ways of using

ingredients in products. However, where can a line be drawn between sufficient and necessary sustainability initiatives? As seen before, consumers can be highly aware of sustainability, but not act sustainably. Being green, sustainable, investing in clean technology, increasing eco-efficiency, recycling seem to be all around us. This has been good for the industry as a cost-saving exercise. However, sometimes one wonders whether one is doing enough to become sustainable. Such awareness is often localised at household level and strongly related to money-saving attitudes. Sustainability has not yet been translated awareness into buying patterns.

In the Future for Food and Farming, more commonly known as the Foresight Report, the urgent need to address the future challenges of the UK food sector has been recognised. Food production has a unique nature which, nevertheless, have failings that need to be addressed. In that report, policy makers are alerted to the fact that food goes far beyond narrow perspectives of nutrition, economics and food security (BIS, 2011).

In the UK, the Department for Food and the Environment have identified that the food industry accounts for:

- about 14% of energy consumption by UK businesses and 7 million tonnes of carbon emissions per year;
- about 10% of all industrial use of the public water supply;
- about 10% of the industrial and commercial waste stream;
- 25% of all HGV vehicle kilometres in the UK;
- healthy food choices and information that will assist consumers to adopt more healthy and balanced diets; and
- 12.5% of the UK's workforce.

As a result, the food industry has come up with The Food Industry Sustainability Strategy (FISS) (Defra, 2006) which aims to tackle issues in the food chain that would enable a more sustainable future business environment for the industry. The Institute of Grocer Distributors (IGD) have responded with an initiative to reduce the impact of transporting food and groceries. Through Efficient Consumer Response system in place, the Sustainable Distribution project aims are rival companies sharing vehicles and warehousing taking some 900 lorries off the British roads, saving 48 million miles or 26 million litres of diesel per year.

#### **4. CASE STUDY: COMPANY 'X'**

In 2008, Company X launched their sustainability environmental programme. Since then, Company X have already made considerable progress in the areas of water, logistics, recycling, packaging and carbon emissions targets. In a quest to further internalise its achievements, Company B have identified the need to look into some of their chain of supply with a view to improving relationships, reducing risk and creating value that would, ultimately, be communicated to both internal and external stakeholders of the company.

In an increasingly volatile world, Company X have also identified the UK agricultural community as being at the core of its sustainability agenda. In so doing, they have set new targets focussing on the producers and intermediaries in the supply chain. Following Company X's sustainability agenda, past experiences showed how successful interventions with specific farmers' groups could be achieved. Concrete gains in improving storage conditions and reducing waste, hence improving the overall quality of the product served for Company X to consider what more could be done to take the gains further.

Learning from previous experiences, Company X have also identified the need to improve both the environmental and economic sustainability of the grains supply chain. The grains value chain is key to Company X's strategic position as UK grain is an important input in most of Company B' recipes. The grains supply chain involves suppliers of inputs, producers, brokers, millers and grain co-operatives. The relationships between these stakeholders would also require a better understanding of its context as well as the issues around that sector. The need for a strong and clear understanding of what sustainable agriculture represents in the context of Company X would facilitate the company's future business philosophy. This would help, not only its operation, but sustain and improve its market position.

External Pressures - The volatility in the price of grains has been a matter of concern in recent years. Added to that, the production of bio-fuels has affected growers' strategies as farmers seek short term price advantages. Deregulation in the EU and shortages of grain from important producing countries such as Australia and Russia have impacted on Company X's continuity of supply of premium variety grains/flour. Company X sources grains from a dozen of UK millers, and would like to develop closer and stronger relationships with these millers. It is expected that strengthening these relationships would contribute to their economic stability. In view

of the fact that Company X core business is not about grain/raw material production or milling, the likely disappearance of such intermediates in the grains value chain has also become a matter of concern, since the company requires effective continuity of input supply. For example, the current production of high yielding feed wheat for ethanol puts pressure on the supply of baking group 3 varieties. This also means that availability of these varieties has been declining in recent years.

**Production** - One of the main issues for the implementation of sustainable crop production is that the high agro-chemical and fertiliser input agricultural model, combined with mechanised agriculture, is considered the most efficient form of arable farming (van Loon, 2005). Therefore, it is increasingly difficult to find an alternative option that will be successful enough to encourage producers to switch from a well-established production system that will be beneficial to them.

**Yield and Genetics** - In the UK, there is evidence that yield has doubled since 1970 based mainly on the nitrogen use effect. All wheat breeding is commercial and trials show that it continues to increase yields. But when these results are transported to the field, producers do not achieve the same potential yields. The use of a Recommended List, where new varieties must out-perform existing cultivars before they can be released commercially, adds to the pressure on plant breeders to achieve ever increasing yields.

The current view of grains specialists at HGCA is that the focus on the variety is put on maintaining yield rather than dramatically increasing it. To some extent, in a highly regulated agricultural sector under the Common Agricultural Policy of the EU, prices finally exerting clear signals for farmers might not be a bad thing. However, more recently, due to the widespread no-till practice, farmers have also experienced increasing problems with black grass and other grass weed species.

**Good Agricultural Practice** - Through the following of Good Agricultural Practice (GAP), farmers supplying to Company X ought to improve the overall sustainability of their inputs in order to secure an outlet for their product. According to the Defra Code of Good Agricultural Practice, there are a number of different management plans that can be created by the farmer to improve the sustainability of their activities. These include: manure management; nutrient management; soil management and crop protection management. Benchmarking best agricultural practice against current agricultural practice for farmers is an interesting field for Company X where gains could be achieved.



Biofuels - While there is some concern about the demand for Group 4 wheat driven by bio-fuels (two bio-fuel plants have recently been completed in the North East of England), wheat analysts at HGCA suggest that this is not the main driver for falling acreages of Group 3 wheat varieties. Their view is that world weather patterns have played a larger impact on yields. This idea is also supported by a report from the baker company Hovis plc in which it states that ‘the impact of extreme heat in Russia is now estimated to have reduced its wheat harvest by 16 million tonnes (more than the size of the entire UK wheat crop), with Ukraine and Kazakhstan estimated to be reduced by 4 and 5 million tonnes respectively.’ Furthermore, on the scientific sphere, Rothamsted Research, along with members of the Supergen Consortium, have moved beyond feedstock for the production of biofuels and are focusing on second generation bio-fuels derived from non-food crops which require less application of fossil based fertilisers.

A quest for a standard for sustainable grain production - Agriculture, being the main source of raw material for the food manufacturers provides a great deal of opportunities to improve sustainability of the entire food chain. Francis and Van Wart (2009) considered that the development of a sustainable agriculture and food system must be an essential part of our long-term economic and environmental planning.

## **5. CASE STUDY: UNILEVER**

Unilever in their journey towards developing a sustainable food supply chain have realised opportunities available in the food processing businesses. These consist of encouraging consumers to eat healthier and more nutritious diets. To Unilever in investing in more sustainable manufacturing and distribution systems and in developing procurement systems based on more sustainable forms of agriculture. Nonetheless, each supply chain can be unique, hence what would be factors important for the developing more sustainable supply chains can vary. These can be identified by the type of supply chain, and the individual business attitude to extending responsibility for product quality into social and environmental performance within their own supply chains. In the Unilever case, interpersonal trust and working towards standards were both important in building more sustainable local supply chains, but inadequate to transform mainstream agriculture and raw material supplies to the manufactured and commodity food markets. Cooperation among food manufacturers, retailers, NGOs, governmental and farmers’ organizations is vital in order to raise

standards for some supply chains. These are key to enabling farmers to adopt more sustainable agricultural practices especially those commodities imported by Unilever. The present food supply system has many shortcomings. As a result, a wide range of conflicting issues need to be taken into account when decisions are made regarding how sustainable food and raw materials should be sourced.

Unilever, as a result of long interaction with academia, NGOs and staff they have come up with some Principles of Sustainability:

1. High yield crops with nutritional quality to meet present and future needs whilst keeping low inputs;
2. Minimized adverse effect on soil fertility, water, air and biodiversity as a result of agricultural activities.
3. Increased use of renewable resources
4. Protection and improvement of local communities.

Since 1998, Unilever has engaged in the Lead Agriculture Programme following the indicators of Agricultural Sustainability:

1. Soil Fertility/health: number of organisms per sq meter; number of predatory; mites; number of beneficial microorganisms; soil – organic carbon;
2. Soil Loss: water, and wind erosion loss leading to loss of soil structure and organic matter: soil cover index (proportion of time soil is covered with crops protecting against erosion and leaching per annum/topsoil/hectare);
3. Nutrients as source of nitrogen lost by cropping practices, erosion or emission: inorganic/organic nitrogen/phosphates/potassium applied per hectare/tonne of product. % fixed nitrogen on site v. imported. Balance nitrogen, phosphates/potassium over crop rotation. Nitrogen compound emissions;
4. Pest management which could include natural control: amount of pesticides (active ingredient ) per hectare or per tonne of product. Agrochemical type (profiling, positive list, weighing factor); % crop under integrated pest management;
5. Biodiversity which could be improved by sustainable practices such as greening the middle of fields and edges: number of species (birds and butterflies) natural predators systems (hedgerows, ponds and non-cropped areas; level of biodiversity off-site (cross boundary) and crop genetic diversity;
6. Value Chain – farm economics in integral part of the value chain: total value of produce/ha, farm income trends; quality specifications/ nutritional values, minerals, pesticide residue and foreign bodies; ration solid waste reused/recycled over

solid waste to landfill; financial risk management and solvency, value of nature and ecosystem;

7. Energy: natural sun and energy to power machinery – sustainable balance should be positive. (total balance input/output including transportation; ratio renewable/non-renewable; greenhouse and pollutant gases;

8. Water. Irrigation water use/ha; leaching and run-off of pesticides, nitrogen, phosphates, potassium to surface or ground water;

9. Social and human capital: farmers group, group dynamic and organisational density. Rural community awareness; rate of innovation;

10. Local economy: agricultural inputs (goods, labour and services sources from local economy (amount of money re-invested locally; % local goods and labour, level of employment in local community, and

11. Animal welfare, feeding, housing and watering, treatment of diseases, freedom of abuse.

Unilever's group of farmers under the Lead Agriculture Programme consists of one advisor from academia, one NGO and one employee. They work to identify Good Agricultural Practices to bring sustainability values for each indicator to a higher level.

- Sustainable Practices must have a demonstrable benefit for the farmer and farm

- Many farms are not managed in a sustainable way. Many conventional farmers rely heavily on agrochemicals disregard soil fertility and don't pay enough attention for diversity and have little understanding of social dynamics of rural communities. Agrochemicals are more used than necessary or recommended.

- How farmers recognise a significant outbreak of key pests and diseases against prophylactic spraying?

- Sustainable farming is knowledge intensive, not agrochemical intensive.

There is a growing realisation that we have to rely of agriculture for food, fibre, feed and fuel. It is felt that different types of supply chain require different types of intervention. There are also many examples for other organisations with a range of initiatives such as the Sustainable Agriculture Initiative Platform (SAI), Round tables for tropical commodities which are important for Company B's ingredient product mix. Regarding the grains supply chain, there are many different stakeholders who require addressing such as, input providers, farmer perception regarding price and

contracts, yield gap, millers, logistic and storage not to mention the universe around consumer trends and changes in demand.

## 6. OTHER EXAMPLES

Food manufacturers develop foods that are safe, nutritious, interesting, taste and feel good. They decide which foods to produce and how to price and market them. Baldwin (2009) mentioned that food processors exercise control in the way a supply chain can be sustainable. The main areas to be tackled are waste, the use of energy and water. In the UK, companies which have come up with sustainable schemes with examples showing positive results are Nestle (landfill), McCains Foods in renewable energy, Walkers in water, Sainsbury's in recycling, Unilever (below), amongst others. These gains at plant level are also clear as part of Company B's experience. However, the gains are not enough. According to Baldwin (2009) the focus towards a more sustainable operation has to shift towards improvements in agricultural production as a result of it being the major source of environmental impact in the supply chain.

The UK Sustainable Development Commission (SDC) has combined many different stakeholders' views to produce an internationally applicable description of 'sustainable food supply chains' as those that:

1. Produce safe, healthy products in response to market demands and ensure that all consumers have access to nutritious food and to accurate information about food products.
2. Support the viability and diversity of rural and urban economies and communities.
3. Enable viable livelihoods to be made from sustainable land management, both through the market and through payments for public benefits.
4. Respect and operate within the biological limits of natural resources (especially soil, water and biodiversity).
5. Achieve consistently high standards of environmental performance by reducing energy consumption, minimizing resource inputs and using renewable energy wherever possible.
6. Ensure a safe and hygienic working environment and high social welfare and training for all employees involved in the food chain.
7. Achieve consistently high standards of animal health and welfare.

8. Sustain the resource available for growing food and supplying other public benefits over time, except where alternative land uses are essential to meet other needs of society.

## **7. DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS**

At first glance, it seems impossible to balance what agronomists think to economists, sociologists, policymakers, activists and food processors want. When tackling a topic so complex such as sustainability, the task to conceptualise and make it more understandable to a larger audience sometimes seems impossible. However, it could be concluded that consumers, pressure groups, government and business could no longer wait with regards to acting about the negative environmental impact that human activities were having on the planet. To understand sustainability is to realise it from a systemic approach. The human activities that generate demand which provoke profit seeking entities to fulfil them have far reaching ramifications. To act sustainably implies a holistic understanding of the quest for change and action by consumers, businesses and government.

Managers when attempting to handle sustainability issues should imagine themselves in front of a control panel where one has to constantly adjust the dimensions of consumption, production, governance and the environment. So far, businesses have been at the forefront of gains with regards to sustainability practice. Governments, either national or supranational, have played an important role in governing and regulating such a change. Nevertheless, consumers have been elusive.

Much of the actions that would support sustainable practices are done based on consumers' and pressure groups' expectations. The role of pressure groups and environmental activists is of value in pushing the boundaries, however, these tend to be sometimes disperse and their effective pro-environmental actions rather diffuse. Pro-environmental behaviour is difficult to be sustained as consumers need to constantly be reminded of the need to act more sustainably. Nevertheless, businesses react and end up engaging in pro-sustainable practices more for fear of pressure groups instead of a concrete result from a pull in demand.

Presently, businesses are attempting to induce consumption towards a more sustainable level. In industrialised nations, much of the negative impact on the environment takes place at household level. The reduction of packaging, the increase

of recycling and a lower quantity of waste reaching landfills have important landmarks towards achieving sustainability by the industry. Despite this, consumers still struggle to separate waste at home. Businesses have engaged in sustainable practices because these are cost-saving opportunities that if accomplished improve efficiency, maximise resource use and create profit. As a result, it could be said that businesses through their profit-making activities have helped the quest for a more sustainable environment instead of mere personal altruistic behaviour.

From the perspective of commodity producing and exporting countries, sustainability issues must be taken seriously. The internalisation of practices imposed to enter specific markets would end up promoting change and generating prosperity. When considering agricultural producing countries with a strong orientation towards internationalising its food supply chain, to enter markets in western nations, it would require not only being competitive in price, but being also able to guarantee shareholder value to importing and retailing companies. In a globalised world, there is little room for the 'us and them'. Many of the practices that support a more sustainable production and processing of foodstuff should be internalised by commodity producing companies so that local societies also gain in the following of standards, improved quality and product assortment.

In the future, being competitive is about being able to engage in activities that generate prosperity. Hence, following a sustainable agenda that sometimes require clear interventions is the way forward. To act sustainably is not a fad from industrialised societies, but rather a reality that cannot be avoided. Usually export products need to follow Good Agricultural Practices, to be traceable and assured. This is not a luxury which is sometimes wrongly perceived as demand by 'rich' western consumers, but it is of the whole food system.

This article is far from exhausting the debate on sustainability. Considering the research agenda for the future, it is important to consider the consumer behaviour dimension regarding pro-environmental behaviour. Should businesses be interested in changing the present levels of consumers acting more environmentally, academia and pressure groups could bring to the discussions an interesting research agenda. Owing to the internationalisation of food supply chains, studies of this nature should be comparative so that behaviours in different societies could be studied.

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