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# Sustainable Operations Strategies: Differing Responses to Environmental Constraints

John Busch

*University of Colorado Boulder*

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SUSTAINABLE OPERATIONS STRATEGIES:  
Differing Responses to Environmental Constraints

By:  
John M. Busch  
University of Colorado at Boulder

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University of Colorado at Boulder  
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Thesis Advisors:

*Max Boykoff, Environmental Studies CIRES*  
*Donna Sockell, Leeds School of Business CESR*  
*Dale Miller, Environmental Studies, Committee Chair*

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## **Abstract**

Businesses today are taking steps toward protecting their access to natural resources. Companies are seeing the benefit of incorporating social and environmental concerns into their corporate strategies. In this paper I explore different approaches firms in developing countries are taking to adjust to pressures imposed by environmental constraints. I highlight key factors that influence the outcome of a certain strategy, or interaction between parties within that strategy. The purpose of the paper is to help businesses better understand the relevant factors in the current global environment that may contribute to or impact their development and implementation of a sustainable operations strategy. Additionally I will provide recommendations that businesses can reference when approaching sustainability.

## **Preface**

The people on Earth are incredibly colorful and complex, much like the physical environment that maintains us. The range of cultures, values, lifestyles, and policies that are present in the human population amazes me. Groups of people are separated by physical location and culture, but all people share a common dependence on the environment to live. I find it interesting to observe how other cultures relate to their natural environment and to compare their relationship to my own relationship with nature. I recognize first that I depend on the environment for essential services like clean water, air, and soil. In order for me to live to be a productive member of society I must consume some portion of the ecosystem services. My personal relationship with the environment goes beyond sustenance to include recreation. I consider myself fortunate to have had access to outdoor recreation in the Rocky Mountains when I was growing up. The natural world is an essential part of my enjoyment and happiness with life and therefore I want to ensure I will be able to enjoy the natural world long into the future.

When I first began thinking about what to write my thesis on I looked to what personal interests I held that would also provide me a topic worth pursuing. I decided to focus on the intersection of two significant interests of mine: people and nature. Business is meant to meet the needs of society through utilizing natural resources. Therefore, it seems necessary to protect natural resources so they can be utilized by businesses, which will ultimately support and perpetuate our species. I want to help business better understand what strategies are available to achieve a sustainable operations model. Ultimately, I want to contribute to society while protecting nature so that future generations can enjoy the same benefits I receive from the natural world.

The cases are meant to provide examples of how businesses are responding to environmental constraints. Some cases are successful, and some are not. I analyze each case to understand what factors contributed to the company's success or failure. I go on to discuss other relevant issues that contribute to understanding the environment in which changes are taking place in. Finally, I recommend some basic steps that businesses can take to help develop and implement a sustainable operations management strategy.

I would like to thank my family for giving me the constant love and support to achieve my goals. I would like to thank my friends for making life enjoyable and interesting. Finally, I would like to thank my committee members, Dale Miller, Donna Sockell, and Max Boykoff for taking an interest in my success and dedicating their time to guide me through this project.

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# Introduction

Different industries experience different environmental constraints, therefore any implementation of sustainable practices is context specific. Environmental constraints refer to instances where natural resources are being consumed either inefficiently, unsustainably, or to the detriment of natural ecosystems. There is no universal road map to sustainability and no compass to navigate the incorporation of sustainable operations strategies. Sustainability is a broad term so individual businesses should develop their own understanding of what sustainability means in the context of their operations. For my purposes, sustainable operations will include green-minded business activities that increase resource efficiency, or protect natural ecosystems. Businesses are implementing strategies that are unproven and are relying on trial and error to tweak their strategies. This creates a wide range of approaches and strategies to address environmental conflicts.

In this document I will focus on cases from heavy industries including mineral extraction and manufacturing to explore what factors help create or diminish shared value. Shared value involves creating economic value in a way that also creates value for society by addressing its needs and challenges (Porter & Kramer, 2006). The purpose of this paper is not to understand what is driving environmental concern but rather to understand what strategies companies can use to implement sustainable strategies. In drafting this document I used published primary research drawing from electronic databases. I researched current environmental trends and determined who are the experts and researchers in the field. I gathered case examples of past businesses and their experience with environmental conflicts. I will use case studies to illustrate successful and unsuccessful approaches that firms have used to address environmental constraints.

Additionally, I will discuss factors from each case that affect a firm's ability to implement its strategy, including social and economic forces. Businesses need to account for localized social, cultural, and political norms in their environmental strategies in order to facilitate implementation of the strategy at the functional level.

The case studies and analysis are meant to help draw parallels from past experiences to current environmental conflicts. This document highlights factors from previous operations strategies to show what kinds of issues are prevalent when implementing a sustainable operations strategy. Parts of the analysis focus on a single interaction between two parties within a strategy such as the relationship between a firm and its suppliers. I will use the analysis to propose some broad recommendations that businesses may reference when developing their customized operations strategy. The recommendations will not be applicable in every context, but may provide general direction and insight into the issues firms should be concerned with when incorporating sustainability measures into their operations strategy.

It is difficult to establish a relationship between a single variable and the overall success of a sustainable operations strategy. This document explores relevant factors one at a time to better understand how individual interactions contribute to the success of a given strategy. It should be noted that each individual set of circumstances contain a variety of factors that may affect the outcome. Instead of looking at the surface of each factor and its relationship to the others, this document explores a few factors in greater detail. Additionally, stakeholders weigh factors on a scale that may imply greater importance of a single factor to that stakeholder. This document does not attempt to weigh the importance of individual factors but rather recognizes that each contributes to the collective outcome.

## Background

Authors Amory Lovins, Hunter Lovins, and Paul Hawken, explore the idea of internalizing costs of business that are currently born on the natural environment in their book, *Natural Capitalism: Creating the Next Industrial Revolution* (1999). The book seeks to understand how the economy would look if businesses assigned value to natural and human capital as limited resources that are necessary factors of production. The authors recognize that the availability of natural capital is a limiting factor in future economic growth and therefore natural capital must be assigned some value in order to ensure efficient resource use. Sustainability can be viewed as a way to maximize energy and resource use through use of information and knowledge (Mathur, 2002). Sustainability is ultimately about protecting access to resources. In contrast, traditional business models view natural capital as a limitless input and therefore have no incentive to protect natural resource stocks. Accounting models fail to record natural resources as a company asset that should be utilized as efficiently as possible in order to ensure the highest possible returns on the use of that resource.

Environmental conflicts may be the result of a lack of information and misunderstandings between parties (Peet & Watts, 2004). When individuals are basing their perceptions of environmental issues they will first use direct experience as a reference and then use secondary reference (Peet et al., 2004). In the absence of direct experience, individuals rely on information provided by others. Friends, family, and political leaders all become important sources for the individual to gain understanding, which they use to develop their own opinions. Businesses can provide information and education to help local communities understand the relevant issues. There is a significant



role of a well-informed society in enabling the public and individuals to take initiatives to improve the environment (Council Directive and the Paris Charter, 1990).

In addition to protecting natural capital, the book also recognizes the need to protect human capital. The principles behind protecting human capital are similar to the above stated principles for protecting natural capital and the authors recognize the interconnected relationship between society, business, and the environment.

It is not enough to merely recognize the significance of the interrelationships between society and the natural environment: there must also be a recognition of the fact that these relations and linkages define and continue human society (Barry, 2000). This new approach to valuing natural capital represents a paradigm shift that recognizes the need to protect natural ecosystems. Although the new natural capital paradigm exists it does not mean its ideals will be or can be embraced by the business community. In many cases sustainable initiatives only sustain themselves and grow within a company if they deliver measureable business benefits (Willard, 2002).

Firms are increasingly aware of their environmental impact; however, there are many factors that affect the implementation of environmental strategies. Environmental conflicts are the result of complex interactions between individuals, communities, governments, and business. The understanding of environmental issues contains even more interconnected relationships between social, economic, political, and cultural factors that determine how each group exerts pressure and influence on the others. Businesses must balance the needs of multiple stakeholders in order to create shared value in a desired environmental outcome. Some barriers to implementing ecological norms include: financial obstacles; economic and technological obstacles; lack of consistent regulation; competitors' actions; and lack of infrastructure (Antweiler,

Copeland, & Taylor, 1988). Many businesses embrace the opportunity to be an industry leader in the environmental field citing positive increases in their sustainable reputation (Anderson, 2009). Industry groups like the Coalition for Environmentally Responsible Economics (CERES) position themselves as a progressive network of investors, environmentalists, and public interest groups who still seek capital gains, but through sustainable ventures.

Shared value involves creating economic value in a way that also creates value for society by addressing its needs and challenges (Porter et al., 2006). Howard Bowen defines Corporate Social Responsibility (CSR) as, “the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society” (Bowen, 1953). Shared value is not an approach to corporate social responsibility but rather a new way to achieve economic success. It focuses on identifying and expanding on the connections between economic and societal progress (Porter & Kramer, 2011). Shared value can be correlated to natural capitalism because it recognizes that the needs of society are met through utilization of natural resources. It can be difficult to delineate social and environmental concern because the two are so closely connected. Even human relationships with nature take on a social dimension which is dictated by the socio-cultural models in place in that society (Pawtoski, 2008).

Note that it is difficult to achieve continuous improvement in the state of the environment without economic growth (Antweiler et al., 1988). People value environmental concern in the context of current, more pressing issues such as eating. It is unreasonable to expect people to change their behavior if the alternative option leads to some negative impact on their livelihood. Especially in developing countries, people need

the income to provide sufficient health and safety before they can place future value in their natural resources. Profits need to come at the simultaneous benefit of the environment, not at the expense of the environment.

## Businesses Cases

The cases are meant to provide insight into how companies are responding to different environmental constraints in developing countries. Each case illustrates a company and their approach to solving the conflicts associated with environmental constraints. Some cases are successful attempts to create shared value, and some are unsuccessful.

### *OK Tedi Gold Mine, Papa New Guinea*

Broken-Hill Proprieties (BHP) is an Australian-based company that manages the OK Tedi gold mine located in Papa New Guinea. The mine opened in 1986 and operated for most of a decade before local communities and governments began to pressure the mine to clean up its pollution, particularly rock deposition in river systems. In 1996, BHP settled a lawsuit and paid approximately \$28 million in reparations to communities affected by the mine's pollution. Although the company paid the settlement, relations with the community deteriorated and the mine is scheduled to close in 2012.

The Yonggom are a local tribe who played a major role in the handling of the legal procedures against BHP. The Yonggom voiced their displeasure with the mine's pollution and eventually gained international attention for their lawsuit. The tribal leaders requested that the company pay reparations and that they maintain the river in a more vigilant manner. Although the company did pay the settlement, the OK Tedi Mine failed to initiate any substantial clean up effort and continued to pollute the river system. A new

lawsuit was proposed and BHP responded by offering private settlements with the different communities. This strategy turned out to backfire as it created a rift between communities whether to join the lawsuit, or take an outside cash settlement, which still wouldn't do anything to improve the river pollution. Some communities did accept the settlement, but the Yonggom view this strategy as betrayal.

The managers at the OK Tedi gold mine fail to recognize that the environmental impacts of their mining operations are actually part of a more important social relationship (Kirsch, 2008). In order to understand the mine's failure to operate in an environmentally and socially responsible manner there must be an understanding of the managers' inability to recognize that the social relationship is heavily valued by the Yonggom people. The Yonggom people avoid divorce because any separation of the family creates an enemy. Instead of divorce, families can salvage the relationship through reparations and stipulations on how future interactions will proceed. In the case of the OK Tedi gold mine, the Yonggom people feel that the company did not rectify the situation properly and therefore there must be a divorce between the community and the mine making them enemies. The Yonggom helped launch another lawsuit in 2007 on behalf of 3,000 Ninggerum villagers, which is currently seeking \$4billion in damages. BHP admits the mine is not compatible with the company's environmental values and is therefore choosing to cease operations.

The OK Tedi gold mine did provide some positive outcomes for villagers in the Fly River basin such as better infrastructure, access to healthcare, better schools, and steady income. Although the OK Tedi Mine provided some benefits to the local communities, this case represents a failed attempt to create shared value. In this case the environmental concern actually came second to the social relationship that the mine had

with the communities. Although the Yonggom people expressed concern for the river system, they felt largely betrayed by the way the company handled itself in their social interaction. Because of the cultural customs of the Yonggom people, the mine became their enemy. The OK Tedi Mine failed to understand the cultural norms in Papua New Guinea and therefore created an enemy that made operating the mine significantly more challenging and costly.

This case illustrates a traditional capitalist viewpoint that ignores external costs absorbed by natural ecosystem services and focuses on acting solely as a profit machine. The mine continued to operate knowing the environmental consequences and when faced with recourse, the company chose to try and buy out the villagers rather than make noteworthy improvements in their pollution patterns. The Yonggom felt BHP betrayed them by not upholding their promise to reduce future pollution as part of the settlement. BHP chose to use monetary incentives to avoid environmental pressure instead of investing in their operations to reduce their environmental impact (Kirsch et al., 2008). This failure shows that economic incentives are not always powerful enough to make people overlook social or environmental concerns. In the end, their failure to incorporate social and environmental factors into their management strategy ultimately led to the mine's demise. BHP managers needed to repair the social relationship along with the economic relationship in order to have the support of the local communities.

### *Exxon-Mobil in the Niger Delta*

The petroleum industry in the Niger Delta provides an example of the clash between economic, environmental and social factors that arise from the extraction of

resources from developing nations. Foreign petroleum companies divvied up the oil fields of the Niger Delta in the late 1950s and have been in conflict with local communities for decades. The social unrest in the region is often a direct result of interactions between oil companies looking to extract the oil, and the communities looking to utilize their resources to advance development and enjoy a higher standard of living. The indigenous populations that live in the Niger Delta are bearing the cost of the externalities from petroleum extraction. Some specific concerns of indigenous communities include health concerns from gas flaring (burning off waste gases produced during oil refining), low crop yields, and loss of fish populations in the river ecosystems (Idemudia, 2008). The surrounding communities are suffering at the expense of multinational petroleum companies whose products are exported along with most of the profits. In response, indigenous communities are filing lawsuits, forming NGOs, and retaliating with acts of violence. These responses pressure the oil companies in some way or another forcing them to modify their business.

The major petroleum companies recognize the need to employ a community relations strategy in the Niger Delta, but some have proven more successful than others. Exxon-Mobil employs an in-house strategy that keeps many decisions within the corporate veil and eventually leads to communication breakdowns and poor community relations.

Exxon-Mobil's community relations strategy limits interaction with the company through a select group of intermediaries and community representatives. A survey found 100% and 79% of respondents in Ikot Ebidang and Inua Eyet Ikot, respectively, were not satisfied with the communication with Exxon Mobil (Idemudia et al., 2008). Exxon-Mobile offices are located in Inua Eyet Ikot so based on geographic proximity

community members here have slightly more access to Exxon personnel, but the survey shows a communication breakdown is evident despite operating in close proximity to the community. A male resident of the village explains one problem by saying, “Go to Qua Iboe Terminal. There are police everywhere, you cannot speak to anyone if you are not a chief or local government chairman” (Idemudia et al., 2008). In Ikot Ebidang, community members are more isolated and are subject to further marginalization. The lack of communication between Exxon-Mobil and the surrounding communities leads to misinformation and misinterpretation from both parties. For example, when Exxon-Mobil decided to move a distribution facility out of the village of Onne to another location, Exxon told the new community they had to move because the conditions in Onne are too unstable. The information traveled back to residents in Onne who felt offended that they had been categorized as violent people. A group of youths retaliated by vandalizing assets and harassing Exxon personnel.

Exxon-Mobil’s community relations strategy fails to incorporate a comprehensive representation of the local populations and this contributes to social and political instability in the region. Their strategy limits the communication channels that are available to them and means Exxon must rely on interaction with a few community members to try and disseminate information. As a result, the majority of the community members view Exxon-Mobil as an outside agent acting separate from the community. The locals associate Exxon-Mobil only with economic benefit but not with social or environmental benefits. Exxon’s strategy of interacting with a few individuals creates tension between communities who compete for resources distributed by Exxon’s community improvements programs. Each chief lobbies for the needs of their particular village and needs in one village may be significantly different from needs in surrounding



villages. This strategy lends itself to conflict over resources and doesn't provide a unified development plan that is needed to provide social and environmental stability.

### *Total Petroleum in the Niger Delta*

In contrast to Exxon-Mobil's strategy in the Niger Delta, Total employs a much more inclusive strategy which opens up formal and informal communication channels and provides a more stable community environment to operate in. Total includes community members in decision making and works with an independent NGO called the East Obolo Community Foundation (EOCDF) to ensure Total's community relations strategy accounts for the concerns of all community members. Including the community members opens up significant informal communication channels that act to supplement the formal interactions between Total and community chiefs and leaders.

The EOCDF works with 36 different communities to develop community improvement programs that will be beneficial to the most people. Total achieves insider status with many communities and therefore gets the benefits of informal communication. Individuals discuss their concerns during informal street conversations and through social conversation at meals and other gatherings. Community members are more open to discussing their concerns and view Total more favorably because of it. Sixty-eight percent of respondents in the village of Emereoke state they are satisfied with communication between Total and the people (Idemudia et al., 2008). The local people are willing to discuss environmental concerns with Total and are open to working with Total to develop a plan that will benefit the community and the environment while allowing Total to operate profitably within their communities.

Total Energy uses an inclusive community relations strategy in the Niger Delta in order to provide social and economic stability which often leads to greater environmental stability. Environmental concern is a luxury for many communities that arises only after social and economic stability is achieved. The social and environmental concerns for Total are interconnected so it can be said that Total's environmental initiatives are also social welfare initiatives and vice versa. This case represents a more successful example of a company actively pursuing goals beyond profit including social and environmental concern. Although there is still social conflict and flagrant environmental degradation in the Niger Delta the trend in industry is to be more conscious of industry's impact on their communities. Total recognizes the need to act as a global citizen as part of a long-term business strategy that focuses on natural resources, including people.

### *Guitang Group and Sugar Refining in China*

The Guitang Group owns and operates the largest sugar refining factory in China and holds exclusive contract rights with companies like Coca-Cola, Pepsi, and local beverage company The Wahaha Group. The Guitang Group is known for its successfully Supply Chain Management System (SCM). The company owns multiple subsidiaries in industries that use the co-products or by-products from one process in another. Sugar is their main manufacturing line but they also operate an alcohol plant, pulp and wood product line, a cement mill, and a fertilizer plant. Guitang's SCM allows the firm to recycle and re-use inputs in order to operate a closed loop supply chain. The Guitang Group primarily aims at improving economic and environmental performance simultaneously, which they achieve through three steps. The first step is to keep close

relationships with their main suppliers, the sugarcane farmers, to ensure adequate supply of high quality raw materials. The second step is to produce high quality sugar, which is vital to gain more market share and the optimal economic benefits. The third step is to take full advantage of the sugarcane and develop the relevant industries that use the co-products, the by-products and even the residual products (Cote, & Zhu, 2004).

Maintaining a close relationship with sugarcane farmers is central to the Group's SCM. The Guitang Group purchases sugar cane from the farmer, refines it and uses byproducts to make fertilizer which it sells back to the farmers. The two parties are interdependent on each other and therefore work together to provide the most quality product efficiently. The sugar from the Guitang Group is considered premium quality and sells for 30%-35% higher than sugar from other Chinese factories in 2000 (Cote et al., 2004). The premium price allows The Guitang Group to reinvest in more waste management solutions and the farmers benefit from a stable supplier relationship and receive a fair price for their sugarcane. The Guitang sugar refinery is ISO 9001 and meets all local and national environmental standards.

Even in industries traditionally considered resource intensive the Guitang Group manages their environmental and social risks through supply chain management and holistic product planning. Guitang is familiar with life cycle assessment and uses this tool to accurately assess their environmental impact and to identify areas that need improvement. The Guitang Group is using this holistic CSM approach for another purpose of cost reduction. Information exchange and transaction costs between different levels of the supply chain can be expensive. The Guitang Group operates facilities across multiple steps in the supply chain which facilitates easy communication and reduces transaction costs. The Group employs closed loop operations to limit their impact on the

environment while simultaneously producing profit and contributing to a developing Chinese economy.

## Discussion and Understanding

The cases provide examples of how different firms approach environmental and social issues. Traditional capitalist views of profit maximization do not always create desirable social and environmental outcomes. Industry certainly will play a role in advancing sustainable development; however, agreement does not exist in the business community as to what the relevant environmental issues are, how serious they are, and how they should be addressed (Anderson & Batemann, 2000). Firms can differentiate themselves through their approach to filling a role in progressing sustainable development and protecting natural resources.

### *Social or Environmental Concern?*

At times it can be difficult or impossible to separate social and environmental issues. This issue is illustrated in the case of the OK Tedi Mine and in the cases of Exxon-Mobil and Total petroleum in the Niger River Delta. The cases all involve large MNCs (Multi-National Corporations) operating in communities who depend on their local resources to gain economic value. In order to gain the economic benefit the communities must cooperate with the large companies who have the necessary assets to access the resources. The communities provide human capital and provide a cooperative environment for the MNCs to operate in. MNCs operating in close connection with communities are inherently engaged in cultural and social interaction.

Managers of the large companies need to be able to understand social patterns of their managers and employees in local operations facilities in order to get efficient production. In the case of the OK Tedi Mine, the managers attempt to separate environmental and social issues. The company attempts to solve environmental issues by paying settlements and does not even acknowledge the social aspect of the problem. The mine fails to create shared value because they only contributed to economic value and ignore societal value. As a result the community exerts pressure on the company through legal action, information campaigns, and through guerrilla techniques which is ultimately forcing the closure of the mine and a failure of development.

Conversely, Total's case in the Niger Delta represents a company incorporating environmental and social issues into their management strategy. Total focuses on building positive community relations in order to facilitate communication about different issues. By opening up communication channels with local communities, individuals are more open to discussing difficult issues such as environmental degradation and are more willing to work toward implementing mutually beneficial development programs. Michaelis supports this idea stating, "One step towards a cultural transformation might be for businesses, like other players in society, to enter into more dialogues both internally and externally" (Michaelis, 2003). Dialogue could lead to a substantial change in the way decisions are made, increasing transparency and being more willing to disperse power.

By addressing social concerns and gaining insider status Total creates a more business friendly environment to operate in and allows the company to understand how their operations impact the lives of surrounding communities. Total is creating shared value that invests in human capital and then uses this relationship to develop a tailored

environmental impact management strategy. Through this relationship Total creates economic value by increasing employee productivity, while reducing the costs associated with understanding environmental issues. Local knowledge of ecosystems is a valuable resource to help understand environmental impacts and will help determine possible solutions.

This alliance is crucial for addressing the environmental issues because it unifies the resources of multiple stakeholder groups all working toward a common goal (Wallis, 2010). Mobilizing the assets of multiple stakeholder groups will increase control over our resources and create shared value in natural capital.

### *Good Intentions Are Not Always Enough*

Environmentalism in the business community has only been present since the 1980s; therefore, there must be a transition period and some amount of trial and error. Companies today may be aware of environmental concerns but it is not always clear how they should go about addressing their concerns and they may choose an ineffective strategy. In the Exxon-Mobil case, the company recognizes the need to develop a community relations strategy as a means of creating shared value however, their approach produced negative outcomes. The broken social relationship causes Exxon-Mobil to increase expenditures on security instead of using resources to protect natural capital. When this happens Exxon-Mobil reverts to a short-term viewpoint that focuses on short-term financial performance and returns for shareholders. A shared value approach in this case would seek to create security by stabilizing social relationships.

Exxon-Mobil shows they desire social and environmental stability in the Niger Delta just by developing a community relations strategy in the first place. Although this

is an encouraging step, Exxon's in-house strategy marginalizes many communities and creates rifts and competition between communities. The problem Exxon faces with unstable social relationships makes it near impossible to achieve the cooperation required to implement their planned environmental programs.

In the end, Exxon failed to create economic, environmental, or societal value from this approach. Exxon's intentions may be noble, however their approach is forcing them to be a bystander who contributes little to sustainable development in the region.

### *Operational Efficiency*

Another role that a firm can fill is the role of operational efficiency. The Guitang Group case provides an excellent example of a company utilizing creative operational processes and strategic business ventures to advance sustainable development. The Guitang Group achieves their operational efficiency by employing a closed loop manufacturing strategy that spans multiple industries. Although the Guitang Group primarily focuses on sugar refining, they operate facilities that use sugarcane byproducts as inputs to produce fertilizer, paper, alcohol, and cement. They are essentially their own supplier for certain inputs which helps them control transaction costs. The Guitang Group uses their closed loop supply chain system to develop close relationships with their primary supplier, sugarcane farmers.

The firm sells the fertilizer back to the farmers and in turn builds strong relationships and ensures a consistent quality supply of sugar cane. The farmers benefit because they are paid a premium price for their product and enjoy stable demand from the Guitang Group. The Guitang Group's creative supply chain management strategy



takes the company beyond sugar refining and aims to improve economic and environmental conditions simultaneously (Cote et al., 2004).

This case represents a successful example of a company embracing the natural capital paradigm. The company develops new revenue streams while also addressing a societal need. The Guitang Group protects access to its most important inputs by closing production loops and ensuring that natural capital is available for future extraction.

The refining plant in Guitang meets all local and national environmental regulations and has been ISO 19001 certified since 1991. The company also maintains strong relationships with companies like Coca-Cola, Pepsi, and Wahaha insuring economic longevity. Profitability is still the primary goal of The Guitang Group however they choose to achieve profitability by employing environmental and social concern as part of a larger operational strategy.

### *The Service Economy*

Firms are shifting the internal business paradigm to a more conscious understanding of the long-term benefits of environmental protection. In *Natural Capitalism*, the authors call for producers to shift from an economy of goods and purchases to an economy of services. Products can still be viewed as an asset to the company even after they have been sold. Interface Flor company exhibits this view by leasing carpet and flooring and then recycling and reusing their floor products at the end of a fixed lease term. Under their leasing system Interface Flor provides a flooring service that allows inputs to be utilized by a consumer and then come back to the manufacturer for re-use. Traditional consumer systems contain open loop principles where inputs are refined, utilized, and then discarded. Natural capitalism recognizes the

reliance on natural ecosystem services for basic survival necessities but also as the central input in economic development. Industry is evolving to think on a more extended time scale about levels of resource consumption and many firms are beginning to understand investment in resource and ecosystem sources will ensure the longevity of the organization in the future. Reilly describes good growth as growth that recognizes increased production and consumption are not ends in themselves, but means to an end—the end being healthier, more secure, more humane, and more fulfilling lives for all humanity (Reilly, 1990). The transition to a more service based economy offers one avenue toward the goal of a more fulfilling life for all people. This innovative way of thinking helps close the loops of natural resource consumption patterns while also providing a quality service to customers. Lovins continues to explain that a global paradigm shift will require a focus on quality, utility, and performance as measures of affluence rather than possession of goods.

There will always have to be some amount of production, however businesses can shift the balance of production and service within their operations. Businesses can look for opportunities to move away from production by creatively evaluating their current operations. Western countries currently maintain more of a service model, however they still depend on some level of production in order to provide services. Even in a service industry there are opportunities to provide the service more efficiently.

### *Consumer Culture*

Although I have primarily focused on what businesses can do within their operating boundaries to advance sustainable development there must be some recognition of the consumer culture of the west that has fuels environmental degradation, often times

located disproportionately in developing countries. The previous section introduced the idea of a switch to a more service based economy. In order for that to happen there must be demand for a service based economy and less demand for consumer goods.

Current social trends measure western affluence through possession of goods. Society values possession of goods and finds utility in goods that are inconsistent with the values of natural capitalism. Society needs to change what it values a product for in order to demand the types of products that will create shared value for firms and society. Social trends are drivers of behavior and therefore it is important to work toward embracing a paradigm shift from the demand end of the product life cycle. Businesses will continue to manufacture and sell goods so long as the public demands them so it is important that consumers recognize their role in valuing certain product traits such as energy efficiency.

An average individual in today's world is much more informed and conscious of social and environmental issues. Conscious consumerism is growing and in some instances consumers exert power over a supplier through boycotts or information campaigns. Public Relations (PR) and Corporate Social Responsibility (CSR) are increasingly important to develop and maintain favorable brand management. Clearly businesses are responding to changes in consumer preferences so if consumers can lead the industry will follow. Consumers can open up new opportunities for growth and innovation by changing what traits they value in a product.

Consumers need to contribute to changing current behaviors just as much as businesses, governments, and NGOs need to contribute in order to achieve noteworthy progression of sustainable development. Some factions of society are reevaluating their value judgments however behavior of the majority of society is generally dictated by the

most widely accepted values. A larger proportion of consumer society needs to embrace natural capital values in order to change behavior which will help redefine markets and create new opportunities for innovation.

## Conclusion

Shared value is essential for creating opportunities for growth and innovation while also addressing societal needs. Shared value principles will help develop business models that focus on long-term investment in natural capital that will provide reliable and efficient use of resources. Companies need to focus on obtaining profits that simultaneously benefit the business and society, rather than obtaining profits at society's or the environment's expense. This approach is not social responsibility but rather a deeper understanding of competition and economic value creation (Porter et al., 2011).

Although the natural capital paradigm is in the minds of executives, not all businesses embrace the values of natural capitalism and shared values. Economic, social, and political factors limit the available strategies that business can utilize to create shared value. It is necessary to understand the relevant factors in a business's particular set of circumstances that may determine whether their environmental strategy turns out successful or not.

Adopting a natural capital or shared value approach will not be able to solve every environmental conflict. Each environmental conflict is unique to that economic, social, and political context and it is not always possible to align stakeholder interests. Some businesses will continue to marginalize environmental and social stakeholders in order to meet short-term financial goals, possibly at the expense of missing larger opportunities.

Shared value lays the groundwork for businesses to make the transition to more long-term business models. It will enable deeper understanding of societal needs and help direct companies to provide products and services that advance society's interest. The

principles of Adam Smith's invisible hand theory are still present in this model; however, they are simply perceived in a broader sense. People are still motivated by self interest to create economic value by creating environmental value. The shared value approach is still operating within capitalism, but it represents a much more enlightened self interest understanding of how business intersects with nature and society.

## Recommendations

In this section I will use the key points from the case examples to suggest recommendations that businesses can reference when developing a sustainable operations strategy. The recommendations are meant to help businesses navigate the transition to a more sustainable operations strategy. The recommendations are not comprehensive and companies should look beyond these recommendations to account for all stakeholder groups their unique set of circumstances.

### *For Businesses*

#### Develop a company-wide platform or vision for sustainability

The first step a business can take is to develop a company-wide vision or platform addressing their role as part of society and as part of the natural environment. This acknowledgement sets a standard within the company and establishes a responsibility of the company and its employees. Simply acknowledging businesses' role in protecting natural capital is a start, however this does little to produce substantial changes. Companies need a roadmap to understand where they want to go, and how they are going to navigate the route they have chosen. In order to develop this roadmap, a company must collect information and educate themselves about the relevant issues.

## Provide cross-cultural managerial training and education

If your business is operating inside of multiple countries then providing cultural education and training will help managers utilize their employees more effectively, and will provide a better understanding of the larger cultural context that their business must operate within. Cultural understanding promotes a bi-lateral relationship and represents two sides as equals within the context of a larger environmental problem. Managers will be better able to implement an operations strategy through the cooperation and productivity of the employees under a manager's direction. Another benefit of cross-cultural training is that managers can help the company gain insider status with the communities. Individuals in the community will be more willing to share their feelings about the company to the managers who can use the relationship to help inform company executives when making decisions.

## Use employees as community ambassadors

Employees are valuable resources who act as messengers to the community. The people who make up a businesses are ultimately the same people who make up the community, so businesses can use this relationship to inform and educate individuals about their intentions and expectations while operating their business. Educating employees about sustainability will allow them to pass along accurate information to other members of the community and help build a positive relationship between corporation and community.



Look for opportunities beyond the scope of your current operations in the supply chain

Natural resources are not pure substances and our processes of adding value to a given input often produces bi-products and waste. Innovative companies look beyond their products and services using Life Cycle Analysis (LCA) to determine what other opportunities are available within their supply chain that may be viable business opportunities. Harnessing opportunities within the supply chain actually protects the business's access to their inputs of production because one facet of the businesses creates the inputs for the other. Seek opportunities that are compatible with you current operations for increased efficiency.

Look to shift the balance of production

Business models that focus on the provision of services, rather than provision of goods, hold the potential to address society's needs on a much deeper level. There will always be a need for some amount of production, however companies can look at creative ways to provide the same service without as much production. LCA can be used to identify opportunities to shift the service v production balance within the product life cycle. Consumerism drives the current demand for production and provides short-term profits for businesses, whereas the service model recognizes the larger potential of aligning the values of society and providing a service to address their needs.

## Build in flexibility to your sustainable operations plan

An operations strategy needs to be implemented at the ground level. Each facet of the business works collaboratively to execute the operations strategy. Managers facilitate communication between executives and employees to ensure everyone is on the same page. During implementation a company should continue to collect information that can be used to tweak the fine points of the strategy. Flexibility of the strategy allows for managers to make timely adjustments during implementation. The global society is a dynamic environment so companies should not become overcommitted to a particular operations strategy, but rather continue to seek avenues for innovation.

### *For Individuals*

#### Demand sustainability from yourself and others

Society is formed by a collection of individuals who mutually benefit each other. If the role of business is to serve the needs of society, then that means meeting the needs of individuals so they can in turn contribute some product or service to other individuals, which ultimately builds the mutually beneficial relationship of society. A pessimist might suggest that individuals are simply too small to in relation to the global system to make any significant impact on that system. In reality, individuals hold tremendous power to foster ideas and feed off each other to create power norms. Individuals respond to what are the expected norms as designated by society. Individuals can contribute by embracing a shared value perspective and by illustrating this perspective in their interaction with other individuals. Show others that it is acceptable to engage in environmentally responsible behavior. Even if specific behaviors of the majority do not change in the

short term, the awareness and consideration of new ideas open the door for future changes in valuation processes. I'm not saying everyone needs to be a public icon of environmentalism, but rather individuals need to be icons of adaption. Show that humans are capable of changing even deeply rooted value systems in order the perpetuate society.

### *In Education*

#### Update business school curricula

Educators will need to adapt the curricula to the new understandings of environmental issues. Students can be taught to understand the deeper needs of society and the social relationship that exists between humans and nature. Universities can adopt courses that aim to broaden student's understanding of profits to include societal and environmental profits. New programs can be developed that cut across multiple disciplines that provides students the opportunity to view environmental conflicts from multiple stakeholder perspectives. Because of the traditional divide between economic and social concerns, people in the public and private sector have followed different education and career paths (Porter et al., 2011). Few managers possess both the environmental knowledge and the entrepreneurial mentality to facilitate innovation in environmental protection.

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## Appendix A

Table 1 Satisfaction with corporate-community communication (ranked)

Satisfaction with communication	Host Communities			Total
	Ikot Ebidang (Exxon Mobil)	Inua Eyet Ikot (Exxon Mobil)	Emereoke 1 (Total Plc)	
No	32 (100%)	55 (79%)	14 (32%)	101 (69%)
Yes	0 (0%)	15 (21%)	29 (68%)	44 (30%)
Total	32 (100%)	70 (100%)	43 (100%)	145 (100%)

Table 2 Frequency of corporate-community consultation (ranked)

Regular Consultation	Village			Total
	Ikot Ebidang (Exxon Mobil)	Inua Eyet Ikot (Exxon Mobil)	Emereoke 1 (Total Plc)	
No	27 (84%)	36 (51%)	2 (5%)	65 (45%)
Yes	0 (0%)	10 (14%)	39 (90%)	49 (34%)
Don't Know	5 (16%)	24 (34%)	31 (21%)	31 (21%)
Total	32 (100%)	70 (100%)	43 (100%)	145 (100%)

Table 3 Perception of oil TNCs' contribution to host community development (ranked)

Contribute to Community Development	Village				Total
	Ikot Ebidang (Exxon Mobil)	Inua Eyet Ikot (Exxon Mobil)	Emereoke 1 (Total Plc)	IkotAbasi Idem (non-host community)	
Yes	3 (9%)	56 (80%)	24 (56%)	10 (67%)	93 (58%)
No	29 (91%)	14 (20%)	19 (44%)	5 (33%)	67 (42%)
Total	32 (100%)	70 (100%)	43 (100%)	15 (100%)	160 (100%)

Table 4 Perceived impact of oil production in surveyed villages (ranked)

Negative Impacts of Oil Production	Village			Total
	Ikot Ebidang (Exxon Mobil)	Inua Eyet Ikot (Exxon Mobil)	Emereoke 1 (Total Plc)	
Damage to House Roofs	30 (94%)	66 (94%)	41 (95%)	137 (94%)
Loss of Fish	27 (84%)	66 (94%)	40 (93%)	133 (92%)
Health Problems	25 (78%)	53 (76%)	37 (86%)	115 (79%)
High Cost of Living	15 (47%)	62 (89%)	19 (44%)	96 (66%)
Low Crop Yields	26 (81%)	0 (0%)	0 (0%)	26 (18%)
House Vibrations and Cracks	0 (0%)	15 (21%)	0 (0%)	15 (10%)

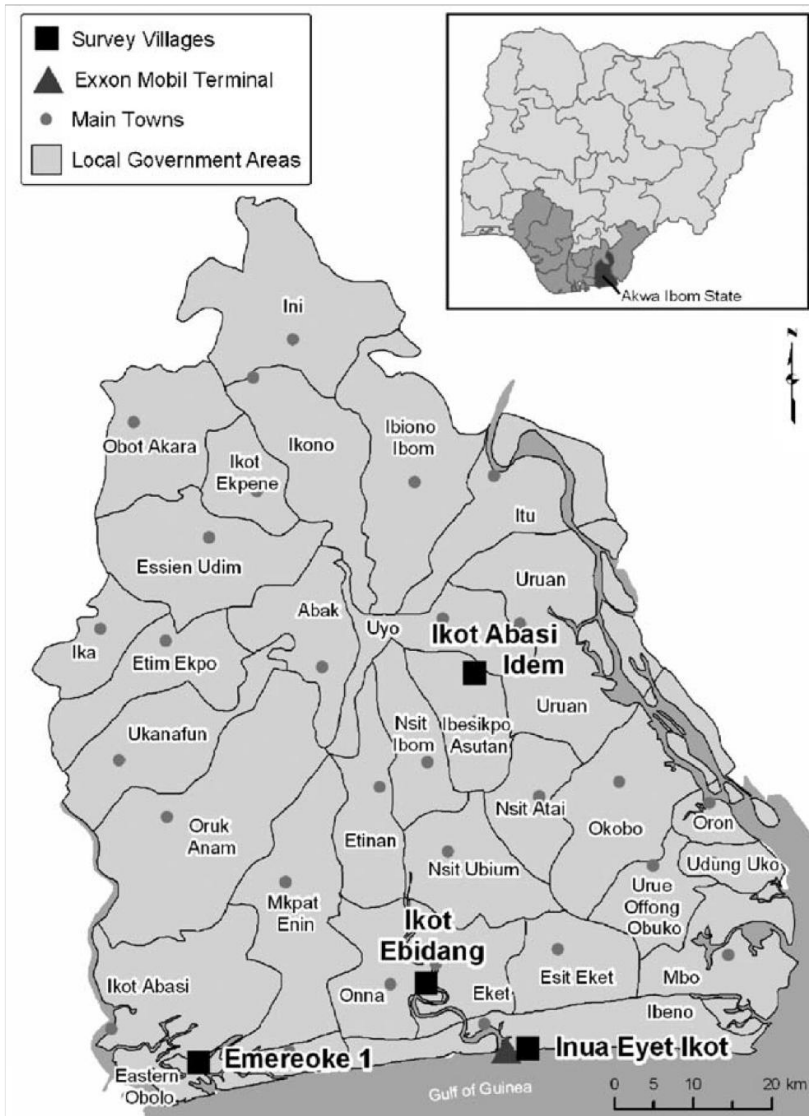
Table 5 Perceived sources of environmental degradation due to oil production (ranked)

Oil Pollution Activities	Village			Total
	Ikot Ebidang (Exxon Mobil)	Inua Eyet Ikot (Exxon Mobil)	Emereoke 1 (Total Plc)	
Gas Flaring	29 (67%)	63 (90%)	40 (93%)	132 (91%)
Oil Spills	0 (0%)	50 (71%)	23 (53%)	73 (50%)

Data from Survey  
(Modified from Idemudia et al., 2008)



## Appendix B



Graphic 1: Map of Akwa Ibom State, Nigeria Showing Survey Villages, Exxon Oil Operations, and Local Government Groups. (Idemudia et al., 2008)

