The Pennsylvania State University

The Graduate School

Department of Learning and Performance Systems

FACTORS THAT LEAD TO ENVIRONMENTALLY SUSTAINABLE PRACTICES IN THE RESTAURANT INDUSTRY: A QUALITATIVE ANALYSIS OF TWO *GREEN* RESTAURANT INNOVATORS

A Dissertation in

Workforce Education & Development

by

Peter Nyheim

Submitted in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

August 2012

The dissertation of Peter D. Nyheim was reviewed and approved* by the following:

Judith A. Kolb
Associate Professor of Education
Dissertation Advisor
Chair of Committee

William J. Rothwell
Professor of Education

Edgar P. Yoder
Professor of Agricultural Extension Education

Wesley E. Donahue
Associate Professor of Education

Richard A. Walter
Associate Professor
Professor-in-Charge

*Signatures are on file with the Graduate School

ABSTRACT

In recent years, more organizations, including restaurants, have concerned themselves with sustainability. As with any new endeavor, guidance is needed. The purpose of this study was to investigate factors that lead to environmentally sustainable practices in the restaurant industry.

Using Rogers' Diffusion of Innovation Theory as a theoretical framework, this study sought out innovators who could provide insight into ecological restaurant operations. Processes added, management and employee effects, and external influences are covered.

A qualitative methodology with certain case study aspects was utilized in the study. Data were gathered through interviews from employees of two different restaurants seen as innovators in the industry. One restaurant was located in an historic inn and offered both casual and fine dining. The other larger one was located in a convention center and likewise offered casual and fine dining. Four employees were interviewed from each restaurant from both the dining room and kitchen components of the operation. A total of eight participants were interviewed.

The study found that much of the environmental processes focused around waste streams and local foods. The use of compostable materials and closer inspection of energy and utility levels were also seen. In addition, critical incidents of each process and their uniquenesses due to setting were noted.

The study also found that managers affected the processes outcomes in a number of ways. Management interacted with the initiatives' success or failure through training, purchasing of both materials and local foods, example setting, and through marketing. Employees affected the processes through peer policing of waste stream contamination,

peer training on local food sourcing and nutritional value, and communication of new ideas.

External influences included customers and competition that either embraced or did not embrace environmental sustainability. While most of the participants agreed that *green* customers, either as individuals or groups, would drive the ecological demand, *non–green* competition could hamper it if the offering were vastly cheaper.

Based on the findings, recommendations for both management and employees are offered. Lastly, suggestions for future research are given, including future study of environmentally sustainable restaurants.

TABLE OF CONTENTS

Page
LIST OF TABLES vii
LIST OF FIGURES viii
ACKNOWLEDGMENTS ix
CHAPTER 1 INTRODUCTION ……...1
Historical Perspective 1
Statement of the Problem 4
Research Questions 7
Significance of the Study 7
Limitations 8
Definitions of Key Terms 9
Assumptions 10
Theoretical Framework 10

CHAPTER 2 REVIEW OF THE LITERATURE 13
Global Warming.....14
Sustainability in Agriculture and Fishing 16
Sustainability in Higher Education 20
Sustainability in Hotels.....22
Sustainability in the Commercial Food Industry 24
The Business of Sustainability.....25
Workforce Education.....27
Diffusion of Innovation.....28
Lean manufacturing.....30
Current Environment 32

CHAPTER 3 METHODOLOGY 37
Research Design.....37
Method 37
Interview Guide 39
Data Collection 42
Research Sites.....42
Subject Recruitment.....44
Participant Description.....46
Pilot Study.....48
Ethics in Data Gathering.....49
Role of the Researcher 49
Validity and Reliability.....50
Data Analysis.....52
Phase 1 52
Phase 2 53
Phase 3 54

Summary 54

Page

CHAPTER 4 STUDY RESULTS 56
Review of the Study 56
Research Findings 59
Results for Research Question 1 59
Processes 59
Uniqueness of Processes in Research Sites 63
Critical Incidents 66
Results for Research Question 2 68
Management 69
Employees 77
Results for Research Question 3 79
Customers 80
Competition 82
Government 83
Farmers and other Vendors 85
Summary 87

CHAPTER 5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS 91
Study Overview 91
Summary of Findings 94
Summary of Findings Related to Research Question 1 94
Summary of Findings Related to Research Question 2 95
Summary of Findings Related to Research Question 3 96
Tying Conclusions to Key Literature 97
Support in Literature 97
Contributions to Literature 100
Recommendations 104
Recommendations for Future Research 104
Recommendations for Management 106
Recommendations for Employees 108
The Road Ahead 109
Lessons Learned 109
Summary 111

REFERENCES 112

APPENDIX A INFORMED CONSENT FORM 125
APPENDIX B INTERVIEW GUIDE 129
APPENDIX C CODE TO THEME SAMPLE 132

LIST OF TABLES

TABLE Page

1 Summary of Processes and Examples of Critical Incidents.....88

2 Managerial Roles and Description.....89

3 Employee Actions.....89

4 External Entities and Description .....……. 90

LIST OF FIGURES

FIGURE Page

1 The process of diffusion of innovation. Adapted from the categories of innovativeness (Rogers, 2003, p.281) 11

2 Project management map 55

3 The process of diffusion of innovation. Adapted from the categories of innovativeness (Rogers, 2003, p.281) 57

ACKNOWLEDGEMENTS

Luckily many people are interested in environmental sustainability. Whether one supports the belief that carbon and other emissions are warming the planet, or not, surely we can produce, use, and dispose of our resources in a more efficient manner. I cannot thank my advisor, Dr. Kolb, enough for her help in guiding me along in this process. Thank you for caring about your students so much. I also wish to thank Dr. Yoder for helping me with my coding and guidance. I also wish to thank Dr. Rothwell and Dr. Donahue in helping me target my study more thoroughly towards the workforce.

I would also like to thank the restaurants and participants used in this study. Confidentiality prevents me from disclosing their names. From the top down and throughout other parts of the organization, environmental sustainability was seen as important. I am very grateful to management. “I will give you whatever you need” are the best words a researcher can hear from leadership.

Thanks are warranted to all of my family and friends for putting up with me during this process. My fellow cohort members, John Park and Carol proved invaluable during many parts of the project and it is much appreciated. Finally, Thank You Lynn.

CHAPTER 1

INTRODUCTION

Historical Perspective

In recent years, more organizations have concerned themselves with sustainability, including restaurants. Sustainability has its roots in environmentalism. Although it might appear to be a recent concern, environmentalism has been with us for some time with differing names and foci. One such example is the word 'conservancy' that began in 14th century Britain with regard to the environmental management of its river basins and colonial forests (Grove, 2002). Centuries later-, in 1970, President Nixon created the Environmental Protection Agency, a federal agency, mainly charged with combating air and water pollution. The 1970s were a busy time for the environmental movement. Additional creations included Earth Day and the formation of the Green party in European politics. It was also during this decade, according to Aras and Crowther (2008), that the term sustainability, in an environmental context, began to take shape. Later in 1987, The World Commission on Environment and Development (WCED) released the Brundlant report which, according to Aras and Crowther, was used in sustainable policy shaping by the United Nations.

Sustainability is often defined in many ways, generally using resources with a future oriented outlook. "Current approaches to corporate sustainability are varied and range from attempts to adapt products and processes to minimize resource use and environmental pollution, and/or to improve relations with the community and other stakeholder groups" (Linnenluecke, Russell, & Griffiths, 2007, p. 1).

Arguably, the most important facet of any sustainable discussion is within the context of climate change. John Farley (2008) states:

> When sunlight strikes the earth, infrared radiation is emitted by the earth. Greenhouse gases in the atmosphere absorb the radiation, which results in a warming of the earth. The greenhouse effect is a very large effect: without greenhouse gases in the atmosphere, the earth's surface would likely be below the freezing point of water. Carbon dioxide (CO_2) in the atmosphere has been increasing since the Industrial Revolution began, due primarily to the burning of fossil fuels and to deforestation. This increase in greenhouse gases causes an enhanced greenhouse effect, which warms the earth (p. 1).

In 2005, the US Environmental protection Agency (EPA) found that 41 % of all CO_2 emissions result from the generation of electricity, and 33 % from transportation (MacCracken, 2009). Internationally, MacCraken lists the findings and results of emissions in the 2007 International Panel on Climate Change (IPCC):

* Emissions from human activities, particularly from combustion of coal, oil, and natural gas using technologies that do not capture and permanently sequester the CO_2, are raising the atmospheric concentrations of long–lived climate warming gasses.
* Enhancing the natural greenhouse effect in this manner will lead to global warming that will, in turn, lead to associated changes in climate and a rise in sea level that will persist for many centuries.
* Changes in the climate and sea level are already evident, and these changes are consistent with theoretical understanding and model simulations of the human induced changes in atmospheric composition.
* Future warming and sea level rise are projected to be substantial, especially if emissions continue to rise.

* The environment and society will be both impacted in significant ways by changes in the climate, CO_2 concentrations, and sea level rise.

* Slowing and stopping climate change, and avoiding the most consequences will require substantial reductions in greenhouse gas emissions over the coming decades (p.10).

At a local level, potential impacts of climate change could affect shipping infrastructure in Pennsylvania.

> Pennsylvania is ranked fourth in the nation in domestic and foreign cargo volume going through its ports, which include a Great Lake port in Erie, an inland port in Pittsburg, and a seaport in Philadelphia. The ports collectively handled around 125 million tons of cargo in 2001 and waterborne commerce provided 280,000 direct, indirect, and induced jobs in 1999. This valuable shipping infrastructure could be negatively impacted from changes to water levels in the Great Lakes and state's river ways - changes caused by climate change (CIER, 2008, p. 10).

While some may doubt the contributions of humans to climate change, and findings from the EPA and IPCC, "During a ten year period beginning in 1993, 75% of almost 1000 abstracts that appeared in refereed scientific journals focused on the subject of climate change" (Brown, 2008, para.1), further adding validity to the concept that carbon emissions are harmful to the environment.

Narrowing the focus to restaurants, the Green Restaurant Association was formed in 1990 (Garlough, 2011) where beginning thoughts and discussions on restaurant sustainability began to take shape. Finally, the next decade saw in a Cornell University roundtable discussion in 2009, that a noticeable shift towards sustainability in the

hospitality industry began in 2005 (Zhang, Jogleker, & Verma, 2010).

According to the National Restaurant Association (2011), the national special interest group for the restaurant industry, there are 960,000 restaurants in the United States with away-from-home meals making up 48% of all meals in 1999 (USDA, 2000). Segments, with some examples for clarity, are:

1) Fast food (i.e. McDonalds)
2) Fast casual (i.e. Panera)
3) Café (i.e. Starbucks)
4) Pub
5) Casual Dining (i.e. Olive Garden)
6) Fine Dining

(Mealey, 2011, para.1)

From a carbon producing perspective, the restaurant industry has many inputs. Much energy goes into producing a meal and providing a proper setting. As one example, more than half the energy consumption in food retail is used in refrigeration (Heller, 2002), and in another example, one chain, Subway, was able to *reduce* the miles its trucks traveled by 15,104,661 miles in 2009 (Doherty, 2010). The restaurant industry is a carbon producer.

The Problem

While CO_2 emissions are extremely important when discussing sustainability, there are other factors to be included as well. Rotting food waste leads to the production of methane. Methane (CH_4) is also a greenhouse gas. “Food scraps account for some 13%,

or 32 million tons, of the total garbage generated nationwide, according to the Environmental Protection Agency. Of that 32 million tons, less than 3% is composted, with the remainder discarded in incinerators and landfills. The food waste that languishes in landfills produces methane, a greenhouse gas 21 times more potent than carbon dioxide" (Douglas, 2010).

Atmospheric damage is very important in the discussion and definition of sustainability. Other related issues including land deforestation, general pollution, and water consumption are also often discussed. The specifics of foodservice sustainability are still in formation. The aforementioned trade group, The Green Restaurant Association (2010, para. 5), offers some guidance on areas in which a restaurant should focus:

Water efficiency

Waste reduction and recycling

Sustainable furnishings and building materials

Sustainable food

Energy

Disposables

Chemical and pollution reduction

Wall Street has also embraced the idea of sustainability, in a report form. According to Ricaurte (2010), 80% of all global companies and all of the largest 100 firms in the US have produced sustainability reports, the vast majority directly adhering to the GRI (Global Reporting Initiative). The GRI reports a company's sustainability efforts. While the Green Restaurant Association provides some focus, and the GRI, a

general report, Ricaurte continues later, "The GRI deals with the ‘What’ and ‘Why’ to the equation, but leaves the ‘How’ up to the organization and related standards or protocols” (p. 1). The goal of this study is to help answer this ‘How’ in the restaurant industry and report the role of individuals and outside forces in restaurant sustainability.

In literature, the discussion of sustainability has seen a vast increase in the scientific journals (Brown, 2008). As stated earlier, in addition to academia, governmental organizations, and international bodies have also taken up research as well (EPA, 2009; IPCC, 2007). Sustainability and the food system are present in agriculture literature (Baldwin & Chung, 2007; Heller & Keoleian, 2003). Generally, these discussions cover sustainable agriculture practices, and waste disposal. In the education literature, topics include the incorporation of sustainability into various disciplines (see Abbas, Bowden, & Clarkburn, 2006; Murray & Murray, 2007) with less in the hospitality education literature (Deale & Barber, 2010). In the hotel literature, discussion of sustainable practices is seen in some articles with a European focus (Goodman, 2000; Tzchentke, Kirk, & Lynch, 2008).

In the restaurant and foodservice literature, sustainability discussions are noted in the beer and wine sector (Barber, Taylor, & Strick, 2009; Kidwell & Peek, 2009) with additional articles again focusing on Europe (Iles, 2007). While the literature begins some discussions on sustainable topics and owner/operator feelings towards the topic (Revel & Blackburn, 2007), little is written on how to successfully infuse sustainable practices into a restaurant organization. Due to the lack of data, and sustainability being a contemporary phenomenon, a qualitative method with certain case study aspects was chosen for this study.

The primary purpose of this study is to investigate factors that contribute to sustainable practices in the restaurant industry. The secondary purpose of this study is to investigate how these practices can be implemented into the operation.

The term practices refer to a wide variety of processes done by many types of individuals within the restaurant operation. From the owner and management, to the employee, as well as outside vendors, many take part in the operation. While different processes are accomplished by varied persons, each is geared to either the direct or indirect support of the restaurant itself.

Research Questions

The purpose of this study is addressed through the following research questions:

1. What environmentally sustainable processes have been added or modified? What was it like going through the process?
2. a. How does management affect environmentally sustainable restaurant initiatives within the restaurant?
   b. How do employees affect environmentally sustainable restaurant initiatives within the restaurant?
3. What effect, either positively or negatively, do outside entities have on the additions or changes in the process?

Significance of the Study

This study is important because many actions by an organization have a negative environmental impact. From emissions, to overconsumption, to waste, more companies have determined that they need to become more sustainable. Well-known organizations have embraced this thinking and have begun to tailor their actions into sustainable ones. One example is the recognizable company, DuPont. “The company (*DuPont*) views its

climate change activities as a way to prepare for the marketplace of 20 to 50 years from now–which will demand less emissions and a markedly smaller 'environmental footprint' from human activity" (Hassol & Udall, 2003, p. 44).

With 960,000 restaurants in the United States (NRA, 2011), this industry is beginning to embrace sustainable practices as well. While literature does exist in a wide variety of disciplines as to what sustainability may entail, little exists on specifically how one can make processes or procedures in the restaurant more environmentally friendly. Of particular importance, and in addition to the important concept of carbon emissions, the restaurant industry is responsible for much of the purchasing, preparation, and disposal of food and food-related items. While carbon emissions are present throughout, the more potent in terms of trapping heat in the atmosphere, methane, is produced from rotting food waste. Again, with only three percent of food waste composted (Douglas, 2010), the restaurant industry is an indirect producer of this greenhouse gas. According to Garlough (2011), 20% of all food purchased is wasted, with total (all) waste being 137 million tons.

Finally, this study is significant for the three main entities involved in day-to-day restaurant operations, owner/management, employees, and vendors. This study will attempt to uncover best sustainable practices for each of these three parties through a study of two restaurants that value the importance of sustainability.

Limitations

Since there is no generally accepted definition of sustainability; one of the possible limitations of the study could be a participant's understanding of the definition. More specifically, in the restaurant industry, participants may actually believe that they are

operating sustainably, when in fact they are not.

In addition to an evolving definition, another possible limitation is the generalizability. According to Yin (2009), the case study method of qualitative research, to be used as part of this study, are only generalizable to theoretical propositions and not to populations or universes.

Lastly, the interview portion of the data gathering may be susceptible to personal bias. Measures will be taken to control this.

Definition of Terms

Climate Change as referred to in the observational record of climate occurs because of internal changes within the climate system or in the interaction between its components, or because of changes in external forcing either for natural reasons or because of human activities. It is generally not possible clearly to make attribution between these causes. Projections of future climate change reported by IPCC generally consider only the influence on climate of anthropogenic increases in greenhouse gases and other human-related factors (IPCC, 2009).

Green house gas is a gas that absorbs radiation at specific wavelengths within the spectrum of radiation (infrared radiation) emitted by the Earth's surface and by clouds. The gas in turn emits infrared radiation from a level where the temperature is colder than the surface. The net effect is a local trapping of part of the absorbed energy and a tendency to warm the planetary surface. Water vapor (H_2O), carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4) and ozone (O_3) are the primary greenhouse gases in the Earth's atmosphere (IPCC, 2009).

A **restaurant** is a public eating place which derives its name from the French term to

restore (Bierderman, 2008).

Sustainability is generally defined as - living within the limits; understanding the interconnections among economy, society, and environment; and equitable distribution of resources and opportunities (Sustainable Measures, 2008).

Waste streams are a grouping of waste materials with specific definable characteristics that remain the same throughout the process generating the waste stream. A waste stream is produced by a single process or sub process or may be combined to produce a single output waste stream (EPA, 2004).

Assumptions

It is assumed that the participants of this study own, work in, or have another type of relationship with the designated restaurant. It is also assumed that the participants are capable of accurate recollection of current and past procedures. It is also assumed that all documentation and artifacts are accurate.

Theoretical Framework

The theoretical framework for this study is based on Rogers's diffusion of innovation. The diffusion of innovation is the process of spreading a new idea, practice, or tool through a social system over a period of time (Rogers, 2003). This process includes information gathering, decision making, and adopting or not adopting something new (Rogers, 2003). Those involved in the process can be categorized into groups according to the time at which they adopt (Roger, 2003). For example those that are the first to adopt are labeled innovators (2.5%), the next group are early adopters (13.5%), followed by early majority (34%), late majority (34%), and laggards (16%) (Rogers, 2003).

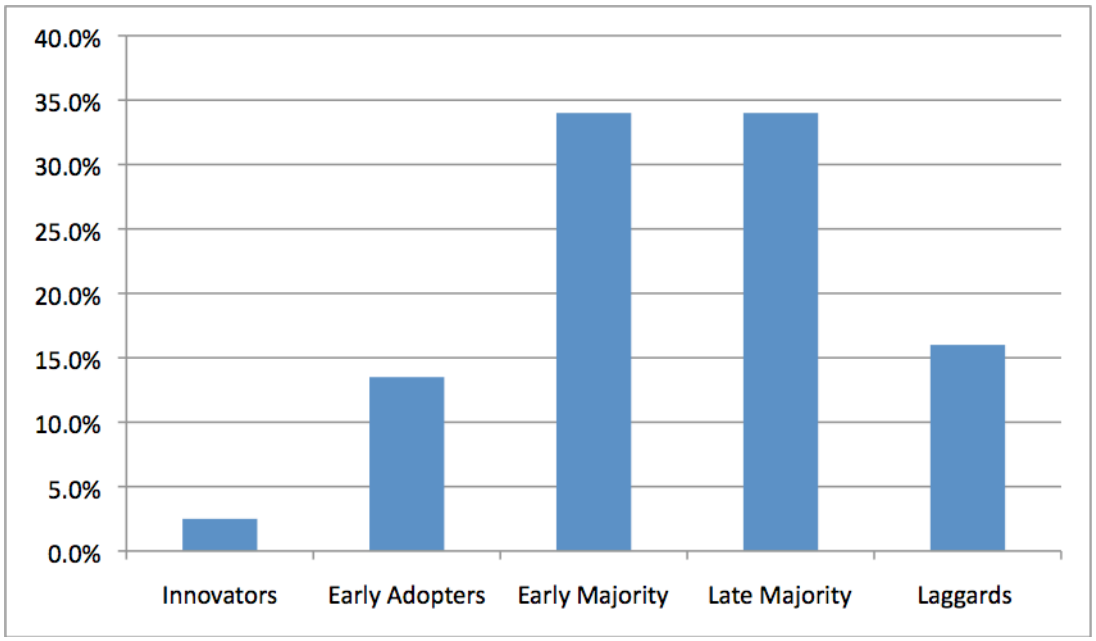

Figure 1. The process of diffusion of innovation. Adapted from the categories of innovativeness (Rogers, 2003, p.281)

With, environmental sustainable practices in the restaurant industry, viewed as the innovation, "then the theory of diffusion of adoption can be used to better understand the characteristics of those that have begun to adopt (innovators and early adopters) and the importance of supporting them during their decision-making processes" (Thout, Vaugeois, & Maher, 2010, p.79).

With regard to innovators, Rogers states that they posses many characteristics including venturesomeness. This risk taking is important since, "The innovator must be able to cope with a high degree of uncertainty" (p. 282). Given the uncertainty and newness of environmental sustainablity within the restaurant industry, innovators are needed for others to learn from in the formation of their own sustainable endeavors. Innovators start this process or as Rogers states. "The innovator plays a gatekeeping role

in the flow of new ideas into the system" (p. 283). This study fcouses on two such innovators described in Chapter 3.

CHAPTER 2

REVIEW OF RELATED LITERATURE

The purpose of this paper is to determine what factors contribute to sustainable practices in the US restaurant industry. In this chapter, the research literature is divided into the following sections: global warming, sustainability in agriculture and fishing, sustainability in education, sustainability in hotels, sustainability in the commercial food industry, the business of sustainability, workforce education and development, diffusion of innovation, and Lean manufacturing. The chapter will end with a section on the current restaurant sustainable environment, and provide examples of some industry efforts in support of the research problem to determine what factors contribute to sustainable practices in the US restaurant industry. As discussed in the introduction, this study is important because many organizations have a negative environmental impact. While global warming, due to carbon emissions, has gotten much of the focus in the environmental spectrum, other issues warrant attention as well. Restaurants, in particular, can have a specific negative impact in their dealings with food, waste, and energy. As one example, while carbon emissions are produced during the running of the operation, methane is also produced if food or food scraps are left to rot. Today, sustainability initiatives are getting more notice in the restaurant sector. However, there is very little published literature on how an existing restaurant can become sustainable. Differing definitions of sustainability and a whole host of certification bodies also add difficulty in understanding. Finally, although environmentalism has been around for some time, sustainability in the more general hospitality industry only began in 2005 (Zhang, Jogleker, & Verma, 2010).

Global Warming

Sustainability is strongly related to the topic of global warming. According to the United Nations and most scientists, global warming is caused by greenhouse gases. A greenhouse gas gets its name from the purpose of an actual greenhouse where water vapor is used to trap heat and keep the greenhouse warm. Greenhouse gases are the result of anthropogenic emissions with the main emission being carbon (Breidenich, C., Magraw, D., Rowley, D., & Rubin, J.W., 1998). "In December 1997, in Kyoto, Japan, over 160 parties to the United Nations Framework Convention on Climate Change (FCCC or Convention) adopted the Kyoto Protocol, which for the first time, established legally binding limits for industrialized countries on emissions of carbon dioxide and other green house gases (GHGs)" (Breidenich, et al. 1998). While the threat of global warming is agreed upon and important enough to foster a United Nations protocol, others are skeptical. The journalist, Alexander Cockburn believes, among other things, that water vapor found in clouds is the main cause of global warming (Farley, 2008). While some may debate the role of greenhouse gases, the Intergovernmental Panel on Climate Change (IPCC) of the United Nations states: "This warming is predicted to have various global impacts, including the melting of polar ice caps; rising sea levels (which could result in inundation of islands, and other low-lying areas); increased intensity and frequency of storms; changes in amount (probably an overall increase) and timing of precipitation; changes in ocean currents; and an enlarged range (in terms of both latitude and altitude) for tropical diseases such as malaria, cholera and dengue fever" (Breidenich et al. 1998, p. 316). The goal of this paper is not to study the cause(s) of global warming. Rather, my purpose is to find what factors contribute to environmentally sustainable

practices in the restaurant industry.

The history of man-made global warming is a rather recent phenomenon in the scope of human history. “Although Swedish scientist Arrhenius first suggested in 1896 that CO_2 emitted from the burning of fossil fuel would lead to global warming, the issue did not receive sustained political attention until the 1980s. In 1992 the United Nations Framework Convention on Climate Change set a goal of stabilizing atmospheric concentrations of GHGs at a level that would present dangerous interference with the climate” (Hassol & Udall, 2003, p. 40). Fossil fuels include coal, petroleum, and natural gas. “Fossil fuels come from deep within the earth, through millions of years of compressing decaying plant and animal matter. While it was alive, the organic matter absorbed carbon dioxide” (Miller, 2010, p. 21); then “sunlight and moisture converted these ingredients to carbon, hydrogen, and oxygen, the basic ingredients of fossil fuel” (Stengress & Frost, 1996, p.129).

More specifically in the United States, the EPA found in 2005:

Of the U.S. CO_2 emissions, 33 percent result from transportation (more than 60 percent from the use of personal vehicles), 27 percent are from industry (split between direct use of fossil fuels and use of electricity derived from them), 21 percent are from residential use, (70 percent from use of electricity), and 18 percent are from commercial sources (78 percent due to electricity). The electric generation sector uses 93 percent of the coal in the U.S., and, because combustion of coal leads to higher CO_2 emissions per unit energy than other fuels, 41 percent of the CO_2 emissions result from generation of electricity (MacCracken, 2009, p. 13).

Drilling down to the individual/household level, Gardner and Stern (2008) list

some household energy consumption rates as a percentage of total energy usage. The top five expressed in percentage of total individual/household level are:

1. Private motor vehicle 38.6
2. Space heating 18.8
3. Water heating 6.5
4. Air conditioning 6.2
5. Lighting 6.1

With findings such as these, the Kyoto protocol made specific recommendations. Specifically, using 1990 as the base year, the United States was to start to reduce its emissions by 7% beginning in 2003. This never happened. “Ultimately, however, a compliance procedure that sets forth specific consequences for noncompliance may be essential to ensuring adherence by the parties to the protocol’s obligations” (Breidenich et al., 1998). This lack of consequences in the emissions part of sustainability serves as a significant roadblock to environmental improvement within the restaurant sector and well beyond. This chapter introduced the need and background of sustainability in the context of global warming. With only one planet, it is vital to use our resources with the future in mind.

Sustainability in Agriculture and Fishing

As a supporting industry to restaurants, the agriculture industry contains more literature and history on the topic of sustainability. In addition to fossil fuels and their emissions, and keeping in mind that wood in trees contains carbon, deforestation also

plays a significant role in global warming. According to the food and Agriculture organization of the United Nations, 25% of GHG emissions are caused by deforestation (2005, para. 1). With agriculture accounting for much deforestation, and many unsustainable inputs, the sector has begun to address sustainability. In livestock farming, some of the major problems to sustainability include the number of inputs (food and fertilizer) and their associated discharges (runoffs, waste, animal gas discharges). Crops for animals need fertilizer which may need petroleum to be produced. This fertilizer along with the animal waste is high in nitrogen. With spring showers often accompanying early season fertilizer usage, heavy runoff can occur. “High levels of nitrogen and phosphorous in the soil and surface waters may lead to eutrophication, which involves excessive algal growth and can lead to potential adverse effects on biodiversity or human uses of waters” (Melse & Timmerman, 2009, p. 5506).

In the literature, the critical term, life cycle assessment (LCA), used in a number of industries, is introduced. “Life cycle assessment is the analytical method to evaluate the resource consumption and environmental burdens associated with a product, process, or activity (ISO, 1997). In plant agriculture, the products are more limited than one might think in terms of human consumption. “Only 10-20 crops provide 80-90% of the world’s calories” (Brown, 1981) dominated by corn, soybean, and wheat. At the beginning of the food lifecycle, the farmer has many decisions concerning sustainability. “Despite the attractive alternatives that sustainable agriculture represents for many farmers, widespread adoption of sustainable agriculture practices (SAP) has not occurred” (Rodriguez, Molnar, Fazio, Sydnor, & Lowe, 2008, p. 67). According to Rodriguez et al. (2008) some examples of sustainable agriculture practices include reduced fertilizer and

pesticide usage to name a few. The authors also point out that there is a view that being sustainable in agriculture reduces crop yields due to less fertilizer and pesticide usage. In an industry where maximizing ones yield is mostly the goal, this feeling is problematic. Additionally, with a common opinion that sustainable goods cost more, both the agriculture and restaurant industry have many challenges of perception.

Switching from land to sea, much of the sustainability focus is concerned with the overfishing of particular species. Numerous outlets exist that disseminate which fish species are in jeopardy. One popular smart phone application is the free application named Seafood Watch, sponsored by the environmental foundation, Monterey Bay Aquarium Foundation. With a couple taps, the user can see which fish to avoid, and which are in abundance. However, with multiple formal and informal distribution channels worldwide, the sector can be very unreliable. In the article, "An impediment to consumer choice: Overfished species are sold as Pacific red snapper", by Logan, Alter, Haupt, Tomalty, & Palumbi, (2008), the authors test the accuracy or truthfulness of labeling of the fish in question. Their study involved the purchasing and labeling of rockfish (an overfished species). Their findings stated that many of the species were marketed and sold as other species adding difficulty to those who wish to purchase sustainably.

As stated earlier, rotting food produces methane which is 20-25 times as powerful as carbon emissions in trapping heat. Disposal in the agriculture sector has gained much attention with differing opinions on how it should be handled. While the agriculture sector produces many direct carbon emissions from "shredders, front loaders, and turning equipment" (Boldrin, Andersen, Moller, Christensen, & Favino, 2009, p. 803), methane

emissions gain less attention. The idea of composting is introduced, where the food and other waste decomposition is managed over time in such a manner that reduces harmful emissions and results in a beneficial nutrient source for growing. The topic of excess food and food waste is covered in a number of disciplines. With that in mind, the EPA has offered guidelines on what should be done with the excess (EPA, 2000). Their guidelines state the food excess should go towards human consumption first, animal consumption second, composting third, and, to the landfill last.

An alternative view on handling excess food and waste focuses on its conversion into hydrogen and methane as sources of fuel. While methane directly emitted is more potent than carbon emissions, the emissions from burning it as a fuel are far less harmful than coal and oil, a big selling point to the natural gas industry. The authors Sun-Kee Han and Hang-Sik Shin (2004) state "Because food waste has a high energy content, it seems ideal to achieve dual benefits of energy production and waste stabilization." Since both hydrogen and methane are fuels which result in these less harmful emissions as compared to coal and petroleum, much investigation is currently taking place in this potential fuel source. With certain vehicles now using such inputs as used fry grease as a fuel, the restaurant industry has the potential to create different fuel sources as well from such things as its waste, adding to this discussion of alternative fuels.

This section highlighted sustainability in the agriculture sector. Although the concept of sustainability may seem new, "until 1940, all fruits and vegetables were grown organically (no fertilizer or pesticides)" (Garlough, 2011). Through technology, biology, and chemistry among other disciplines, the modernization of the agriculture sector has now put much of it at odds with nature. In reaction, small farmer movements

are taking place throughout the nation, such as The Pennsylvania Association for Sustainable Agriculture (PASA), where sustainable practices are taught to both the farmer and interested restaurateurs. Through efforts such as these, sustainability is gaining further traction in both the agriculture and restaurant sectors.

Sustainability in Higher Education

While in the current educational environment, sustainability is seeing an increased focus, much of its emphasis is not new. The topic named, environmental education, predates much of any sustainable curriculum offering today. The authors Hines, Hungerford, and Tomera found in their 1986 study involving environmental education that responsible environmental behavior was due to knowledge gained in a wide variety of disciplines. Within academia, the task of cross disciplinary education is not an easy one. “The higher education sector is a complex realm, involving students, academics and administrators, and their diverse attitudes, skills, experiences and knowledge, and programs of study which traditionally transform students into graduates who assume responsibilities in society. So curricula delivered within this sector (*environment*) should derive directly from the needs of the society that it serves. As such, there are many challenges facing higher education if it is to actualize its potential for contributing to sustainability” (Sibbel, 2007). However, incumbent within the definition of sustainability is the consumption of resources that are becoming scarcer. With that in mind, many career oriented majors at the university level have begun incorporating sustainability into the curriculum taking on the challenge offered by Sibbel. Additionally, industry is beginning to demand it. According to Murray and Murray (2007), “those delivering career-based education can expect increasing pressure from accrediting bodies to

embrace sustainability within the curricula." How to do it successfully is still up for debate. As one such example of teaching sustainability to specific majors, the authors El-Zein, Airey, Bowden, and Clarkeburn (2006) discussed the challenge of making sustainability appealing to engineering students who "usually view technical subjects as the only essential part of the curricula" More narrowly, in the hospitality education literature, the authors Deale and Barber (2010) found through their research, "Three of the most important topics for inclusion in a sustainable educational setting as suggested by the respondents to this study were, creating sustainable business models, training and education, and changing consumer business models." While discovery is indeed taking place on what content makes up a sustainable discipline and cross discipline education has been attempted, cross discipline curriculum design is also being addressed in the more career focused majors such as hospitality. This also contains challenges. The authors Lozano-Garcia, F.J., Gandara, G., Perrni, O., Manzano, M., Hernandez, D.E., & Huisingh, D. (2008) presented this problem and concluded that it was indeed difficult since one must also possess knowledge of the other fields as well as sustainability concepts. Whatever the difficulties, it appears that higher education is furthering the concept of sustainability across the curriculum.

In addition to curriculum, universities are also making their operations more sustainable. While many universities have been making great strides, actual recorded data on their efforts can be lacking. In one study (Miller, 2010), the author noted how a university used posters and table tents to educate the student population on sustainability initiatives and their role within it. Wording included such things as reducing water usage and electric usage. Many other universities have developed sustainability programs with

measurement of its effectiveness still in the early stages. According Miller (2010), who looked at 10 respectable ones, Rutgers University "looks like it has the most extensive effort regarding measurement than all of the colleges and universities discussed." Another study by James (2009) compared three different university's sustainability initiatives and found among others that top level buy-in is important. However, like all entities, universities also have their challenges in going green. Dahle and Neumayer (2001) concluded that current hurdles include: financial, awareness shortage, cultural issues, and a lack of space in certain urban campuses. Although in the early stages, from both a curricular and operational standpoint, universities are giving sustainability more attention. Its impact through the education of future generations and possible new operating models has great promise. It is up to all the stakeholders to make sure that it reaches that potential.

Sustainability in Hotels

The closely related hotel industry can also provide some insight into restaurant sustainability. Hotels by their very nature also consume a large amount of resources and likewise contain independent operators and chains, as well as franchisees. They also have paying guests. This guest, who has paid for a room night(s), has certain expectations as to the resources provided both in the room and throughout the property. Minimizing these resources and their (hotel's) carbon footprint in general is a challenge. While there are many definitions of sustainability, one key tool used in the hotel and other sectors is the aforementioned Global Reporting Initiative (GRI) which details a company's sustainability initiatives. "Presently, 80% of global 250 companies and all of the 100 largest firms in the US have produced sustainability reports, the vast majority directly

adhering to the GRI" (Ricaurte, 2010). According to Ricaurte, the GRI is helpful for comparisons, but stops there. Since the hotel and general hospitality industry as a whole only began to shift towards sustainability in 2005 (Zhang, Jogleker, & Verma, 2010), the industry as a whole is in the very early stages of developing its best practices. The authors do note some interesting concepts on consumption based on their study of US hotels. In general, they break them down into operational and behavioral factors. Operational factors are those that are under management's control and include energy, water, sewer, and maintenance. Behavioral ones are determined by the guest's consumption and include laundry, linen, room amenities, and food and beverage supplies. While it was no surprise that the hotels with food and beverage operations had additional operating costs, what did stand out was that those hotels that were run by management companies consumed fewer resources as opposed to owner/operated hotels. Lastly, the authors found that operating factors were more efficient in urban areas than in rural ones. Taking these findings and moving to literature on European hotels, the author Goodman (2000) found that the Nordic hotel chain, Scandic Hotels, have been adopting sustainable measures long before their US counterparts where the combination of the purchasing and environmental functions began in 1997. Europe has a reputation for being more environmentally friendly and for a longer period than the US. Lack of comparative space could be one factor. Another could be works and agendas put forth by the many *green* travel and tourism industry organizations on the continent. A specific successful example is noted by the authors Tzchentke, Kirk, and Lynch (2008) where the country of Scotland created a Green Tourism Business Scheme that accredits over 500 businesses today.

While Europe clearly started addressing environmental issues earlier, the United States is making progress.

Sustainability in the Commercial Food Industry

Restaurants are part of the commercial food industry which also includes supermarkets, and convenience stores. Sustainability is a challenge. While sustainability can be very broad, measurement and comparison are in the early stages. One applicable topic to sustainability that has been measured is food loss. According to Jones (2004), food loss as a percentage of total food used in the commercial food industry is ranked as follows:

1. Convenience stores 26.3%
2. Fast Food Restaurants 9.55%
3. Full service Restaurants 3.11%
4. Supermarkets .76%

These percentages make up 35 million tons annually (Jones, 2005). As a total, the entire restaurant industry loses 12.66% of all its food used. It needs to be noted that the supermarket industry is quickly entering and competing with the traditional restaurant industry in both dine in and take out options. With their different set up, processes, and business models, they will not be treated as part of the restaurant industry in this study. Another industry, the sister hotel industry began studying sustainability earlier. However their findings do not always necessarily transfer. Recalling the fact that a hotel sustainability study (Zhang, et al., 2010) found that owner/operator hotels were less

efficient in sustainability initiatives, the opposite was found by Jones in the restaurant sector. Regarding food loss, "small 'mom and pop' restaurant had the lowest loss percentages." At the chain or multi-unit level, altogether different results appeared. The author found that large chain fast food restaurants had a much lower food waste percentage (5-7%) than small local chains (up to 50%) with 'just in time delivery' of cooked food being the primary reason for the high loss rates. According to Jones, this logic of already cooked and prepared food also accounts for the high loss in the convenience store industry. Cooked and prepared foods are the commercial food industry's primary finished good. However, it is perishable, with unsold units, mostly discarded. The focus of this paper includes the food waste aspect of sustainability in the *restaurant* industry. With supermarkets handling food loss the best, convenience stores the worst, and restaurants in between, possible swings in either direction are possible. It is the hope of this paper to find sustainable initiatives that would lessen this number.

The Business of Sustainability

How sustainability is viewed from a business perspective is very subjective. One may see it as just another initiative where costs and benefits must make financial sense to the specific company in question. Others may view the potential benefits from a wider scope than just the organization, to the world at large. Still others may view it as an added cost to meet environmental regulations. One study by Rimanoczy (2010) added the importance of leadership in furthering sustainability initiatives. From leadership to profit and loss, looking at sustainability from a business perspective is in its early stages. In calculating the ROI for green projects, the authors Phillips and Phillips (2011) state "The ultimate payoff of green projects and sustainability efforts is to address climate change,

deforestation, food and hunger, and many other issues we face." Aligning sustainability efforts with the business processes is coming more into vogue with possibly, and surprisingly, to many, Wal-Mart leading the way. As one example noted by Humes, in his text, *Force of Nature; the unlikely story of Wal-Mart's green revolution* (2011), he details the effects of Wal-Mart discontinuing a larger bottle of one detergent for an equally effective concentrated version: "Over a three year period, that meant 95 million pounds of petroleum-based plastic resin would not be used. Four hundred million gallons of water- used to bulk up those big jugs of detergents would be conserved. About 125 million pounds of cardboard used to box and ship that detergent would not be used. And more than half million gallons of diesel truck fuel would not be burned hauling those heavier soap bottles around the country- meaning that 11 million pounds of CO_2 emissions were not released into the atmosphere." Humes continues later, "Wal-Mart's move shook corporate America as nothing else could, and other companies-Wal-Mart's suppliers and competitors alike–began to reconsider their own environmental stances, if for no other reason than they knew the retail chain would never go green unless it made sense for the company's bottom line." What may be taking place in larger organizations may not be the case for smaller sized companies. Revell and Blackburn (2007), in their discussion on the small and medium–sized construction and restaurant sector in the UK, state that for small and medium–sized businesses, there is no marketplace incentive for organizations to become sustainable and government regulation is needed. This is important because whether a restaurant is an independent, part of chain, franchised, or structured another way, to some degree it can be considered a small or medium sized business due to the actual size and employee count of the location. The purpose of this

paper is not to differentiate sustainable factors among restaurant types, but rather report what some may demonstrate or lack. In researching sustainable restaurant purchasing, numbers on items other than food in the literature are wanting. As stated by Jones in the last section, 35 million edible tons of food is wasted each year. This amounts to nearly $30 billion (Jones, 2005). Since, according to the NRA (2011) restaurant food sales now account for 49% of the consumer's food dollar, how this industry handles the financials of food purchasing and loss as it relates to sustainability is immense.

Workforce Education

Sustainability in restaurants can be seen as an organization responding to change. An older but still very relevant definition of the concept of organization development within the concept of change is defined by Bennis, "Organization development is a response to change, a complex educational strategy intended to change the beliefs, attitudes, values, and structure of organizations so that they can better adapt to new technologies, markets, and challenges, and the dizzying rate of change itself" (1969, p.2). As with sustainability, organization development is long-range in perspective (Rothwell, 2005). What can be seen as necessary is a new set of employee competencies to address this long term goal. According to Rothwell and Lindholm, "Competency models can be outdated as fast as the organization that developed it faces external environmental challenges, changes its products or services, or confronts customer preferences for different products or services" (1999, p. 96). With all of these factors present in restaurant sustainability, the workforce model needs updating. Environmental sustainability and its implementation into the restaurant, if successful, is an overall theme that needs to be understood by all since,

according to Wolf, (2007) high performing organizations act with clarity of purpose. Finally, this success can be seen when it is imbedded into daily processes or as according to Kotter, “In the final analysis, change sticks when it becomes ‘the way we do things around here,’ when it seeps into the bloodstream of the corporate body” (1995, p. 67).

Diffusion of Innovation

The adoption of environmental sustainability also falls under the topic of diffusion of innovation. As seen in chapter one, diffusion of an innovation is the process of spreading a new idea, practice, or tool through a social system over a period of time (Rogers, 2003). Importantly, much can be learned from the early innovators and adopters. “For instance, compared to late adopters, research has consistently shown that early adopters tend to have more education, occupy a higher social status (measured by income, wealth and occupational prestige), have a greater degree of social mobility, have larger and more specialized operations, and are better accepted in their community” (Rogers, 2003, p.282). The concept of environmental sustainability within the structure of diffusion of innovation is beginning to be covered in literature. Thout, Vaugeois, and Maher (2010) studied the diffusion of environmental sustainability initiatives within a sample of rural Canadian tourism operators and found that, lack of funding, other priorities, and limited access to suppliers of sustainable products to be the biggest barriers. The most common recommendation by respondents for success was incentive programs. Smerecnik and Andersen (2011) also used diffusion of innovation as the model to study environmental sustainability within Canadian tourism, more specifically, ski resorts. Their findings included, “The results reveal that the higher the innovativeness,

the greater the communication by the resort organization to the public, to guests, to workers and to others" (p. 188).

Moving closer to the restaurant industry, Inwood, Sharp, Moore, & Stinner (2009) introduce a linkage between local food purchasing and innovators and early adopters: "The fact that more expensively-priced restaurants appear to purchase larger quantities of local food is in line with the diffusion scholarship expectation that the superior economic resources afforded to these firms, obtained through higher menu prices, may allow them more flexibility to experiment with innovation" (p. 183). Finally, Chou, Chen, & Wang (2011) in their study of the Taiwanese restaurant sector, reaffirm the fact that environmental sustainability (or green restaurants) is a relatively new concept, and considered non essential by many in a for profit environment. Environmental sustainability within the restaurant sector is beginning, but is clearly in the very early stages of adoption.

It must be noted that while environmental sustainability is seen as new in the restaurant sector, healthy foods serve as an example of an innovation rich in history. Healthy food infusion into the American diet experienced many successes and failures during the past century. "Before the turn of the twentieth century, America was a rural farm based economy. Seventy percent of the population, some 60 million Americans, farmed the land and most of them ate the vegetables they grew and livestock they raised" (Thomas Food Industry Registrar, 1998). Shortly after the turn of the century, processed food entered the main stream only to be followed by health food innovators Kellogg and Post "who began a pure foods movement, saying that protein was not healthy and whole grains were the secret to mental and physical well-being" (Beckley, Foley, Topp, Huang,

& Prinyawiwatkul, 2007). Fast forward past Spam and dehydrated potatoes and other offerings realized during World War II to the 1970s and one sees the resurgence of healthy eating in the form of organic foods.

> From her famous Berkeley, California, restaurant, Chez Panisse, Chef Alice Walters fueled a revolution. She reintroduced the idea of cooking with natural seasonal ingredients, an almost forgotten concept because of the prepackaged-food boom. It was the beginning of the natural/organic category, one of the fastest growing segments in the mid twentieth century. Baker/Beech-Nut introduced *natural* baby foods, herbal teas began to appear, and Perrier mineral water flowed into the United States (Beckley et al, 2007).

From here, the whole grains championed by Kellogg and Post in the early 1900s are very much in the news today and there is also a vegetable garden in the White House, demonstrating the influence of these early innovators.

Lean Manufacturing

Much of food service environmental sustainability is dependent on the supply chain and the creation or manufacturing of each individual meal. The restaurant industry is often seen as one of the last industries where this manufacturing process is still done by hand as opposed to by machines. The Lean manufacturing process, also known as the Toyota Production System (TPS), is a notable manufacturing process still embraced and improved upon by businesses today. According to Miller, Pawloski and Standridge's (2010) discussion of Bergmiller and McWright's (2009) article on green manufacturing:

> Founded in post-WWII Japan by Sakichi Toyoda and chief engineer Taiichi

> Ohno, TPS is largely grounded in the systematic elimination of what Toyota identified as the eight deadly wastes (overproduction, human resources, transportation, inventory, motion, corrections, over-processing, and waiting). TPS uses several different tools to strategically align not only their production facilities but their supplier's facilities in the elimination of these wastes (p.12).

Given the success of Lean manufacturing, Engelund, Breum, and Friis (2008) studied food service within a hospital setting in Denmark that recently switched to Lean principles. Among other tools of Lean, the authors presented the Kaizen improvement process where employees are encouraged to speak up and share their suggestions for improvement in a process. In their study, the authors found that kitchen workers through daily meetings by a white board successfully improved processes by offering suggestions on such things as changes to locations of raw ingredients to better lighting. While the authors found much success in Lean, important uniquenesses of the manufacturing process within a food production environment were noted including, perishable inventory, health regulations, and the variation of the ingredient sizes (i.e. carrots coming in different sizes). Lean manufacturing has led to efficiencies in many different lines of business. Importantly, Bergmiller and McCright found that those manufacturing plants that embraced Lean initiatives were significantly greener than those that did not. Waste reduction was a major factor. Aiding in such endeavors are industry standards. The manufacturing industry as a whole has standards, like many businesses, that support it in its functioning. Encouragingly, the well known International Organization for Standardization (ISO) in 2009 offered newer guidelines for green manufacturing. "ISO 14001 is a standard for environmental management systems to be implemented in any

business, regardless of size, location or income. The aim of the standard is to reduce the environmental footprint of a business and to decrease the pollution and waste a business produces" (Miller et al., 2010, p.15). With Lean manufacturing leading to green processes, to newer green standards, the restaurant industry can further learn from the broader manufacturing sector in adopting environmental sustainability.

Current Environment

According to the National Restaurant Association (2011), in 2011 the restaurant industry will see growth of 3.6% totaling $604 billion in revenue. On another encouraging note, Reuters (2011) says that restaurants will benefit as grocery prices increase since restaurants typically have longer term price lock-in commodity contracts than do supermarkets. On a negative note, ABC news (2011) reports that more consumers are dining at home due to the poor economy, in a lifestyle shift which may last for some time. Whichever the case in 2010, there were 59.1 billion visits to US restaurants (Reuters, 2011). With this massive volume, the restaurant is in need of addressing sustainability. According to Rosenblum and Rowen (2010), the important environmental issues to the restaurateur, in order of importance are:

1. Energy consumption costs at store level
2. Packaging/materials cost
3. Energy consumption costs throughout the supply chain
4. Product sourcing (organic, hormone-free, etc)
5. "Green" labeling (menu descriptions, PR, etc)

6. New store/facility construction

7. Sustainable dishes/offerings (farm raised vs. at risk)

As stated in the first chapter, associations such as the Green Restaurant Association (GRA) also offer guidance, as well as certifications for restaurant sustainability at the operations level. Another association of note is the United Kingdom's Sustainable Restaurant Association (SRA) which audits much of the same topics as the GRA with the addition of community engagement and responsible marketing. Many other regional organizations exist. No standard for restaurant sustainability exists. While the concept and execution of restaurant sustainability still in formation, many companies in different segments are making great strides. The following are examples of some companies and their efforts in sustainability.

Burgerville is an all company owned 39 site restaurant chain with operations in Washington State and Oregon. According to Goldstein (2007), the company was founded with sustainability in mind. One hundred percent of their power is provided by a wind-farm, all of their used frying oil is converted to biodiesel, and 85% of its waste stream is diverted from the landfill resulting in $100,000 yearly savings. Waste is also taken into account from the beginning. "While all food is made fresh to order, food waste is kept to a minimum through strategic sourcing and process improvement efforts in the kitchen. Lettuce for salads comes packaged in bags. The only vegetable prep is slicing tomatoes" (Goldstein, 2007, p. 22). Burgerville says much of its success is due to being customer and employee focused where new ideas are welcomed.

Larger chains offer the advantages of economies of scale. The Independent Purchasing Cooperative (IPC) is the Subway owned and operated purchasing

cooperative. Its sustainability initiatives focused on its supply chain. "By 1999, IPC turned its attention to logistics and distribution, realizing that there were significant opportunities to be gained by reducing the amount of miles driven, revamping packaging, and redesigning its supply chain network" (Doherty, 2010). As Wal-Mart directed its vendors to reduce its detergent offering to a concentrated one, so did IPC, saving 180,000 pounds of plastic a year and 150,000 pounds of corrugated cardboard" (Doherty, 2010). According to Doherty, IPC also took an additional important step of hiring an outside consulting firm to calculate its carbon foot print for all products bought, used, and transported.

While chains often have sustainable advantages of their networks, independent restaurants often have more flexibility. The New Belgium Brewery in Fort Collins Colorado offers a restaurant and brewery. "New Belgium's sustainable business practices entail increasing efficiencies in the brewing process, using green design throughout the brewery buildings, treating waste water to obtain methane and sludge rich in nutrients, using methane byproducts to create electricity and heat for the brewery and purchasing wind-powered electricity" (Kidwell & Peek, 2009). Like IPC, according to Kidwell and Peek, The New Belgium brewery also calculated its carbon footprint. In this case for a six pack of their "Fat Tire" beer. This led to the brewery revisiting its operations to reduce its footprint and reengaging with its supplier network to do the same. Much like Burgerville, The New Belgium brewery was created with sustainability as a guiding principle and incorporated it into its vision (Kidwell & Peek).

Switching from land to sea, Darden Restaurant's seafood brand, Red Lobster, has likewise taken on the challenge of sustainability. At $800 million annually (all brands),

Darden is the largest purchaser of seafood in the US (McGuire, 2011). According to their website, Darden (2011) has a sustainability promise:

At Darden we are committed to doing the right thing when it comes to seafood sustainability. For example:

- We are committed to purchasing wild-harvested and aquacultured species from sustainable sources
- We consult regularly with respected scientists to ensure that we stay abreast of changes to ocean eco-systems and to stay current with best sustainability practices
- We use our influence to encourage industry to follow more sustainable practices

Darden has many relationships with Aquacultural (fish farm) businesses and cofounded the Global Aquaculture Alliance (GAA) "to create a uniform set of standards, systems, and best practices for the cultivation of fish and seafood." Finally, Darden is also attempting to raise lobsters. This has never been done.

Moving to the contract food sector, where the food or concessions in schools, businesses, and arenas, serve as three examples of locations, the subsidiary of Compass, Bon Appetit, offers sustainable solutions in its management contracts. As a company who manages already built accounts, Bon Appetit focuses on sustainability from an operational perspective. Examples include, local sourcing, also known as farm to fork, and nutrition and waste stream management. According to their website, they spend $55 million annually with local producers for their 400 locations. Universities such as Oberlin, with a long culture of sustainability, use Bon Appetit. They are also used by companies such as eBay and sports teams such as the San Francisco Giants. With farm to fork and successful waste steam management, though recycling and composting as their

main sustainability offerings, Bon Appetit also differentiates itself through other sustainability initiatives including fair trade coffee and cage free egg purchasing.

Restaurant sustainability is clearly gaining focus with certain aspects such as purchasing and energy consumption gaining attention by different organizations and locations. The next step is to move to a study model of factors that contribute to environmental sustainability in restaurants and see it through a solid research methodology and determine whether there has been a contribution to research.

CHAPTER 3

METHODOLOGY

The primary purpose of this study was to investigate factors that contribute to environmentally sustainable practices in the restaurant industry. The secondary purpose of this study was to investigate how these practices can be implemented into the operation. With this goal in mind, this study was designed to develop a rich description of factors and sustainable efforts in the restaurant industry.

This chapter discusses the methodologies of the study. It consists of three main sections: a) research design and research guide b) data collection (subject recruitment, subjects, ethics in data collection, role of the researcher, and validity, reliability, objectivity) and c) data analysis.

Research Design

Method

A qualitative methodology was used to examine the main factors uncovered in the restaurants as well as the practices put in place. A qualitative methodology was selected for three reasons. First, according to Creswell, (2007) qualitative research is used to develop theories when partial or inadequate theories exist for certain populations or samples. With the purpose of this study being a thorough and rich description of the factors and practices that contribute to sustainable restaurants, a qualitative methodology can facilitate their discovery which is underrepresented in the literature. Second, this study is investigative in nature with setting of paramount importance. According to Creswell again, qualitative research

is used when we want to understand context and setting in which participants in a study address a problem or issue. Further, Merriam (2009) states that qualitative research is suited when an understanding of the problem will result in the improvement of the practice. Third, there is a dearth of empirical studies, as well as qualitative studies, in the literature that cover restaurant sustainability. For that reason, a qualitative methodology based study will contribute to the literature.

Specifically, I employed a qualitative study method with case study aspects to collect data. According to Yin, (2009), if you want to know "how" and "why" a program succeeded or not, a case study or field experiment should be used. Stake (1995) states that the 'real business' of a case study method is particularization where one uncovers not how the case differs from others, but what it does. For the purpose of this study, I employed a qualitative study with some multiple case study designs which according to Herriott & Firestone (1983) is often considered more compelling and robust than single cases. Two restaurants were used as research sites. This method design allowed me to uncover factors that lead to sustainable practices and their implementation in the restaurant industry.

Yin further details six possible sources of evidence: documentation, archival records, interviews, direct observation, participant observation, and physical artifacts. In consultation with my advisor, face-to-face interviews were chosen as the primary source of evidence. Merriam (2009) lists three types of interviews, highly structured, semi-structured, and unstructured interviews. According to Merriam, highly structured interviews in qualitative research lend themselves to capturing specific pieces of information such as demographic data. Semi-structured

interviews are more open ended. “Less structured formats assume that individual respondents define the world in unique ways” (Merriam, 2009, p.90). Finally unstructured interviews are used when “the researcher does not know enough about the phenomenon to ask relevant questions” (Merriam, 2009, p.91). In this study, I used semi-structured interviews within the qualitative method. During the interviews, management and employees’ background, experience, and views were intertwined into the interview questions and often other investigatory questions were asked. This interview format within the qualitative design provided me with an overview of factors that lead to environmentally sustainable practices within the restaurant industry.

Interview Guide

Particularly important in the asking of questions within a qualitative method that utilizes some case study aspects are what Yin describes as ‘second level questions’ where the questions are asked of the case(s) rather than the interviewees in order to obtain a working knowledge of the research sites and the individual itself, as opposed to just the individual. Second level questions were posed to the participants in this study.

In developing a qualitative method design, I consulted previous studies. While no specific qualitative study was found on restaurant sustainability, three qualitative studies on sustainability aided in my research design. The first study is from Rimanoczy (2010) who interviewed business leaders with regard to sustainability. While the study focused much on readiness or what made a leader concerned about the environment, its second focus on their specific corporate steps regarding sustainability provided me with an overview of actions taken at the leadership level. The second study by James (2009)

compared three different university's sustainability initiatives. Its findings provided me with some of the major sustainable issues facing any organization today. Additionally this study provided an example of multiple case study data gathering methods including document review and observation. The third study from Tzchentke, Kirk, & Lynch (2008) looked at small hospitality organizations in Europe using interviews. This study provided me with examples of hospitality specific questions and findings.

At this juncture, I used the research questions as a guide in setting up interview questions as a beginning to the data gathering process.

1. What environmentally sustainable processes have been added or modified? What was it like going through the process?
2. a. How does management affect environmentally sustainable restaurant initiatives within the restaurant?
   b. How do employees affect environmentally sustainable restaurant initiatives within the restaurant?
3. What effect, either positively or negatively, do outside entities have on the additions or changes in the process?

In cooperation with my advisor, and post pilot study, these questions were modified into a questionnaire consisting of 17 open-ended questions (see Appendix B). These questions asked the practitioners various questions in relation to restaurants and environmental sustainability. As an introduction, questions 1-6 asked about general job duties and practices of sustainability put in place and answered Research Question 1. Questions 7-12 focused on the workforce, whether management or staff, and their contact or lack thereof with sustainability and other individuals within the restaurant. These practitioner-focused questions answered Research Question 2. Questions 13-17

uncovered external forces and their impact on environmental sustainability in restaurants and answered Research Question 3.

Of particular importance to the interviews was the concept of critical incidents which was used by Flanagan (1954) to study the merit of US pilot selection in World War II through interviews by a selection board. Flanagan further describes the flexibility of the critical incident technique. “It should be emphasized that the critical incident technique does not consist of rules governing such data collection (next section). Rather it should be thought of as flexible set of principles which must be modified and adapted to meet the specific situation at hand” (1954, p.335). Flanagan’s critical incident technique is still utilized today.

The critical incident technique is a qualitative interview process which facilitates the investigation of significant occurrences (events, incidents, processes, or issues) identified by the respondent, the way they are managed, and the outcomes in terms of perceived effects. The objective is to gain understanding of the incident from the perspective of the individual, taking into account cognitive, affective, and behavioral elements (Gremler, 2004).

The technique is used in service research today as stated by Gremler: “Service researchers have found CIT to be a valuable tool, as the analysis approach suggested by the CIT method often results in useful information that is more rigorously defined than many other qualitative approaches” (p.68). Narrowed down more specifically to hospitality, Callan found that “CIT lends itself particularly well to research in individual operational units or groups of units with similar characteristics” (1998, p. 93). These units are discussed in the next section. The goal of utilizing the critical incident technique was

to get feedback from the green restaurant innovators in the study on how their various environmental initiatives faired. Critical incident questions are addressed in questions 4-6 with the focus of the questions concerning controversial incidents or those that did not go well, emotions seen during the process of sustainable initiatives, and successful implementations. The fact finding potions of the CIT theory are used in the analysis detailed in Chapters 4 and 5.

In addition to the pilot study, consulting prior studies, and soliciting revisions from my advisor, subject matter experts, as defined by their positions and experience, were also used to enhance content validity of the interview guide. I consulted with two practitioners, one in charge of sustainability for a national restaurant organization, and another, a former manager of a foodservice company making great strides in sustainability. Slight modifications resulted in a more robust questionnaire matching the research questions.

Data Collection

Research Sites

The research sites I chose for this study are two restaurants in Central Pennsylvania. These units were chosen based upon their progressive sustainability efforts as defined by the Green Restaurant Association (2010). For the purposes of confidentiality, the names have been changed.

ABC restaurant is a 130 ‘seat’ university owned and operated table service restaurant with a companion 50 seat pub located in the Mid-Atlantic region within a hotel. While many of its patrons are university students and employees, it also draws customers from the surrounding area. With many universities currently adopting

sustainability initiatives, ABC restaurant serves as an example within this setting. ABC is a stand-alone restaurant with its own profit and loss statement within the university hospitality services division. This division comprises of two on-campus hotels with a bar and restaurant in each hotel. ABC is one of those restaurants within one of the hotels. ABC is not part of the larger division that feeds the student population. The hotel itself has over 200 rooms and ample meeting space. Its primary business is university related.

The 300 seat XYZ restaurant and its companion 60 seat pub is the other restaurant within the hospitality division. While ABC restaurant is located in an old country style inn, XYZ restaurant is located in a modern conference center with almost 60,000 square feet of meeting space. While university related persons and local residents make up a large part of the customer base, the majority of guests are there on conference business. XYZ restaurant also has its own profit and loss statement.

While some processes are shared between the two sites, each operates independently and has distinctive feels. Both ABC and XYZ restaurants currently embrace many sustainability initiatives such as buying local, recycling whenever possible, and participate in the university-wide composting system where food and other compostable scraps are picked up six days a week. Other current green efforts include:

- Bulk food used when possible (i.e. bowls of sugar vs. packets)
- Corn based flatware and biodegradable cups
- Waste oil used in the university's biodiesel project

These two restaurants were chosen using purposeful sampling which according to Merriam (1998) "is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can

be learned. Specifically the sample is a *unique* sample - sustainable striving restaurants among other restaurants. Additional criteria were also used in selecting these restaurants.

1. The restaurant must have been in existence for over 5 years
2. It must be making efforts in sustainability as defined by the Green Restaurant Association (see p. 5)
3. It must be located in an area where cold temperatures endure over the winter months

The selection criteria ensured that each restaurant was established in the industry and currently making strides towards being sustainable. The third criterion satisfies a seasonality requirement where sustainability efforts can be made more difficult due to weather. Each restaurant has also won environmental sustainability accolades. The local community hosts many 'green' events in the two restaurants owing to their sustainable reputation. As part of a larger university community, the restaurants also take a leadership role in waste stream management (trash, recycling, compost, ect.) and provided input for the development of computer software used by University waste stream management officials. Additionally, the restaurants serve as a research partner to many professors on campus for such initiatives as energy conservation to water conservation technology testing.

Finally, the restaurants were selected using the diffusion of innovation theoretical framework. Recalling from chapter one, Rogers (2003) states that much can be learned from innovators and early adopters of an initiative. As their accolades and sustainable efforts demonstrate, ABC and XYZ restaurants are innovators in the new movement of environmentally sustainable restaurants.

Subject Recruitment

The General Manager of each site was contacted by phone where the purpose of the study was explained. Additionally interviews, as the data collection method within the multiple case study method, were explained. During our discussion, possible participants were proposed as well as their role and responsibilities within the two restaurants. Based upon his recommendations, and the criteria set in the study, one manager and a chef for each site were chosen to interview. Through these initial contacts, two employees were chosen for each restaurant who also met the study's criteria. In total, I interviewed 2 managers and 2 employees from each location until data saturation was reached. Specific focus was paid to commonalities and discrepancies in the data obtained from the subjects. The data collected from the subjects through interviews were conducted in two stages.

The first stage was to interview a manager from the two main sides of the operation, namely the front and back of house, commonly known as the dining room and kitchen. While both are part of the same operation, their processes vary considerably. Typically, and in this study as well, it is the chef who is responsible for the purchasing of the food and food preparation items as well as the management of kitchen. The dining room manager is responsible for the front of house purchasing such as beverages, furniture, and management of the food delivery staff. Overlap of the two managerial functions does exist. For instance, both are involved in china purchases or *to-go* containers as two examples. These interviews provided insight from a managerial perspective on environmental sustainability within the operation. Each interview was studied for the emergence of common themes.

The second stage of the data collection process involved the interviewing of a staff member from the back of the house and another from the front of the house in each location. The same questions used with management were also used with staff members. These interviews were also studied for themes and provided insight from an employee perspective.

Participant Descriptions

ABC Restaurant

Back of house manager (Chef)

Chef, ABC is in his early 30s and has been working in restaurants for over ten years. He values sustainability so much that he also has also has a side business where he operates a food truck that offers sustainable lunches for the immediate area. While ABC restaurant is his main employment, the cross-over from his additional business provided additional insight into food service sustainability.

Front of house manager (dining room)

Manager, ABC in her late 40s and has been working in and out of restaurants for over 20 years. While the front of the house operation has been her restaurant experience, she is also very nutritionally and sustainably cognizant in her personal life.

Back of house employee

Employee 1, ABC is in his mid 40s and has worked in restaurants for over 20 years in a variety of capacities both in the front and back of the house. Currently he works as a

food preparer, bartender, and banquet server. His experience throughout the operation offered information into the restaurant as a whole from an employee perspective.

Front of house employee

Employee 2, ABC is in her mid 20's and has worked as a waitress in restaurants for over 5 years. Many of her personal interests focus on the environment. While much younger than the others interviewed in ABC restaurant, her take on sustainability within the restaurant came from a newer staff member perspective.

XYZ Restaurant

Back of house manager (Chef)

Chef, XYZ is the executive chef of food and beverage not only for the restaurant outlets, but for the entire conference center. Chef, XYZ is in his early 50s and has over 20 years' experience. He is often consulted by local and state environmental groups for insight into what works in foodservice sustainability for large numbers of persons.

Front of house manager (dining room)

Manager, XYZ is in her early 30s and has been working in restaurants for over 10 years and is charge of front of the house dining room operations. She has recently returned from maternity leave and prides herself, as well as her workplace, with being very environmentally conscious.

Back of house employee

Employee 1, XYZ is a back of the house employee in his mid 30s with over ten years of restaurant experience. Having recently returned from Boulder, Co., a city known for championing sustainability, his input came from a wider perspective than the other interview subjects.

Front of house employee

Employee 2, XYZ is a front of the house food server with under 5 years restaurant experience. While newer to the operation, as well as younger, compared to others in the operation, his views from a younger generational standpoint were insightful.

Each individual was interviewed until data saturation was reached. This was accomplished after two interviews. Employee 2, ABC was interviewed three times due to the scope of her opinions into sustainability. The interviews lasted anywhere from 30 minutes to one hour. These managers and team members from each restaurant, while diverse in background and experience, provided me with different angles and perspectives of two leading restaurants' efforts into environmental sustainability.

Pilot Study

In an effort to develop a sound methodology, a pilot study was used prior to the primary data collection on a third restaurant that satisfied the selection criteria. A restaurant also located in central Pennsylvania, this site has likewise received accolades from the local community for its sustainable endeavors. Efforts include not only local food items, but also *green* catered events where zero waste is the goal. During this pilot study, I interviewed the owner/operator of the restaurant and gained insight into whether

the interview questions were the appropriate ones and were asked correctly. This interview subject had over 20 years of experience, which proved helpful in shaping some questions. It was determined that while the questions accomplished their tasks, the questions involving external entities (interview questions 14 and 15) could be interpreted as too vague and needed to provide possible examples, such as government or competition as possible answers.

Ethics in Data Gathering

I took multiple safety measures to ensure the confidentiality and anonymity of each restaurant studied and all of those who work within it or interact with it (i.e. vendors).

I obtained a Consent form approved by the University's Institutional Review Board regarding the human subjects in my research.

I alerted all participants that no names should be given in any discussion where persons are involved. It was also reiterated that no participant names were to be used. Any participant was instead assigned a code. Each restaurant was given the three letter pseudonym ABC and XYZ.

At each visit to the restaurant, I restated the purpose of the study and stressed that all data would remain confidential, Anonymity of any data gathered using the multiple case study data gathering options, including interviews, was respected. Each participant signed a consent form on which my confidentiality system was explained in writing. All data was stored in a locked file at my house and will be destroyed after the thesis is completed.

Role of the Researcher

Having worked in the hospitality industry for over 15 years in a variety of roles provides the needed background in understanding restaurant processes and its vernacular. I started off as busboy in high school and ended as a hotel manager at age 30. During that fifteen year span in the industry I worked mostly in the casual and fine dining segment on the restaurant side and in clubs and three to five star hotels on the lodging side of the industry. While the segments come with different customers and processes, there are indeed many commonalities such as long hours, quick pace, and customer service.

At age 30 I took great interest in education during a graduate assistantship while pursuing my MBA. Since then, I have taught in two different hospitality management programs. In 2009, I co-founded a sustainability initiative for my current program where we received a grant for our sustainability efforts, including composting almost a ton of food waste a week, growing over an acre of vegetables on university farmland, and adapting purchasing procedures to more sustainable ones. Additionally, I am a member of the university's canola bio-fuel research team. While sustainability may be an evolving discipline, my industry experience and current food service sustainability initiatives provide me with a unique skills-set and understanding. Finally, I have taken two qualitative courses in my studies in which research methods and design were studied.

Conversely, I realize that there exists potential in any qualitative study for the researcher to be too close to the data and possibly corrupt validity. For that reason, I specifically chose two cases where my contact has only been as a paying customer as opposed to other restaurant organizations with which I may have engaged as a consultant or in another professional fashion. In my researcher's role, I remained neutral and took

multiple steps to avoid any personal contamination of the data. The following section presents those steps.

Validity and Reliability

Results of a qualitative study are seen as trustworthy if there has been rigor in the study (Merriam, 2009). In determining whether a study has been rigorous enough, issues related to validity (internal and external), reliability, and objectivity need to be discussed.

Internal validity deals with the question of how research findings match reality (Merriam, 2009). She lists six ways to reinforce it: 1) Triangulation, where multiple sources of data collection are used, 2) member checks, where feedback on the data gathered is solicited from the participant, 3) adequate engagement, the point in time where data saturation is reached, 4) reflexivity, or what the researcher personally feels and assumes, and 5) peer review, where findings are reviewed by a peer. A case study method lends itself to many points of data collection and methods. All five internal validity components in the multiple case study design were utilized enhancing credibility and robustness.

According to Yin (2005), external validity deals with whether a study's findings are generalizable beyond the immediate case study. Three strategies (Merriam) include: 1) rich thick description, 2) maximum variation, where differences in the sample are important, and 3) modal sample, where, like entities are compared. Since I used a qualitative method with some case study aspects, I used strategies 1 and 3.

Reliability refers to the extent to which research findings can be replicated (Merriam, 2009). In a case study method Yin states that two procedures must be implemented: 1) case study protocol, where procedures are recorded, and 2) case study

database, made up of: a) data and b) reports. Yin continues, “A good guideline for doing case studies is therefore to conduct the research so that an auditor could in principle repeat the procedures and arrive at the same result.” With this database serving as a type of audit trail, I recorded what data was captured and the decisions made.

In addition to the audit trail found through the case study protocols and database, objectivity in the case study method also involves considering other points of view (Yin). While also a part of internal validity, I included rival explanations when applicable.

I put these strategies in place to institute validity and reliability in this study.

Data Analysis

Data analysis began with the qualitative method and followed Stake’s (1995) forms summed up by Creswell (2007): 1) categorical aggregation, where the researcher seeks a collection of instances from the data, hoping that issue-relevant meanings will emerge, 2) direct interpretation, where meaning is drawn from a single instance, 3) patterns, where a correspondence is sought between two or more categories, and 4) naturalistic generalizations are developed by the researcher for application. Following this guidance and after the interview data was completed and transcribed, I utilized the qualitative Nvivo software. I familiarized myself with the software to aid me in the organization of my data and for the purposes of coding, with the eventual goal of uncovering themes. This software allowed me to code categories into nodes and served as a central repository for all of my data which proved helpful when the entire data set needed to be probed or queried.

Phase 1

Phase one incorporated open coding techniques where one wants to indentify

anything that might be useful (Merriam, 2009). I listened to the interviews multiple times and then reread the transcripts within Nvivo. I then utilized many of the recommendations from Bazeley's guide on using Nvivo (2010) when I began my open coding process. Keeping the end in mind was important in this first stage as Bazeley states that questions such as "Why is this information important? Where will it take me?" (p.60) need to be asked by the researcher early on. While keeping the end in mind, I still did not rule anything out in this first stage when I began labeling categories using Yin's guidance, "In what way do the codes or concepts accurately reflect the meaning of the retrieved words and phrases and why?" (2009, p.128) Some codes came easily such as *recycling* or *farming*. Others took a little longer to emerge such as *opinion of government* or *sharing of ideas.* Of particular note, from this stage on I found myself consulting the Yin and Bazeley texts more and more. For instance, in this open coding process, I began with what I thought were the two most different interviews in developing my initial free code list, as recommended by Bazeley, since vastly different responses meant more initial codes.

Phase 2

The second phase of data analysis involved axial coding. Axial coding is also known as tree coding. Axial coding is coding that comes from reflection on meaning (Richards, 2005). Meaningful grouping of the free codes was the goal here or as Richards stated, "It is coding that comes from interpretation and reflection on meaning" (2005, p.94). I coded using the "process of relating categories and properties to each other, refining the category scheme" (Merriam, 2009, p.200). As an example, the codes *recycling* and *compost* were studied further and listed as a subset of the higher level axial

code, *waste streams* since many discussions revolved around waste disposal as a whole. Utilizing this process I continued to find relationships within the data and examined all of the interviews in the investigation. I not only also sought out connections among the participants, but also across the two research sites in support of the research questions and theoretical framework.

Phase 3

Data analysis is a process of making sense out of the data (Merriam, 2009). Selective coding was used in this third phase. Merriam states, "In selective coding, a core category, propositions, or hypothesis are developed" (p. 200). During this phase, the basic environmental sustainable processes in place or recommended emerged, as well as effects by management, employee interaction, and external influences. Continuing with the *composting* and *recycling* nodes that were seen as a subset of a larger, axial node-*waste steam*, this axial node developed into a larger theme of waste stream management and improvement. It was identified as an important theme where management and employees used various tactics to reduce contamination and thought of new items or ways to improve the whole waste stream process to become more ecologically responsible.

Summary

This chapter detailed the methodology that I used. Appendix C shows an example of the coding flow from free nodes, to axial codes, to themes. Additionally, a project management map detailing the data collection and analysis is provided at the end of this chapter.

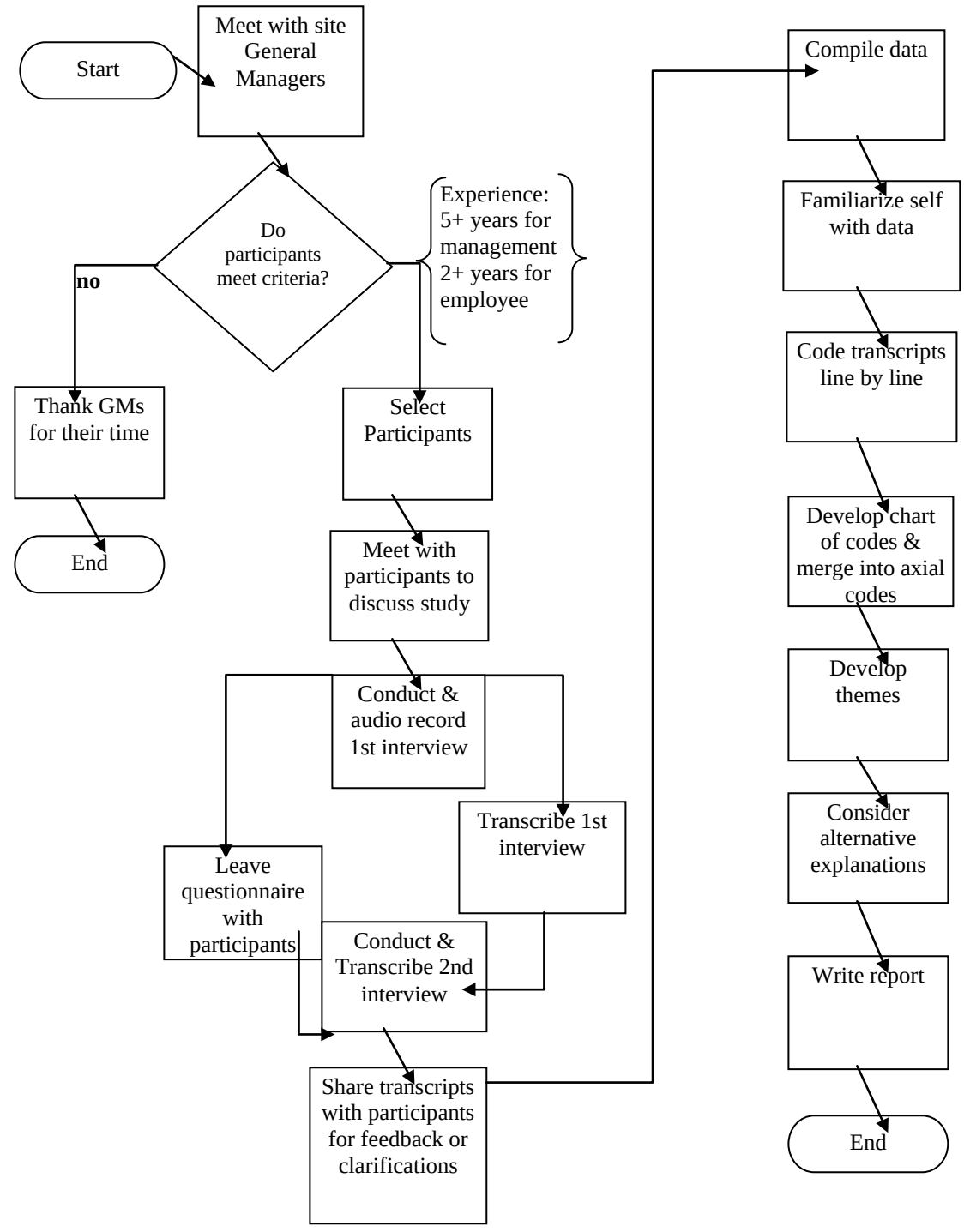

Figure 2. Project Management Map

CHAPTER 4

STUDY RESULTS

Chapter 4 presents the results of this study in three sections. The first section reviews the study's purpose, research questions, research method, and data analysis. The second section provides study results for each research question. Challenges are also detailed through the reporting of critical incidents. The third section provides a summary of each research question in table form.

Review of the Study

The primary purpose of this study was to investigate factors that contribute to environmentally sustainable practices in the restaurant industry. The secondary purpose of this study was to investigate how these practices can be implemented into the operation. With this goal in mind, this study was designed to develop a rich description of factors and sustainable efforts in the restaurant industry. The following research questions were utilized to address the purpose of this study:

1. What environmentally sustainable processes have been added or modified? What was it like going through the process?
2. a. How does management affect environmentally sustainable restaurant initiatives within the restaurant?
   b. How do employees affect environmentally sustainable restaurant initiatives within the restaurant?
3. What effect, either positively or negatively, do outside entities have on the additions or changes in the process?

A qualitative methodology with certain case study aspects was adopted in this study. Two restaurants, seen as leaders in sustainability, were used as research sites. In each research site, one manager and one employee were interviewed from the front of the house (dining room) and one manager and one employee from the back of the house (kitchen), totaling four participants for each site. An objective of the interviews was also to learn from challenges that the restaurants faced in environmental sustainability. These challenges were detailed through the interviews by the participants' description of certain critical incidents of environmental initiatives in the restaurant. In understanding what they have done, what they recommend, as well as the challenges that they faced, one can better understand the characteristics of these innovators in environmental foodservice sustainability as seen in the theoretical framework of this study.

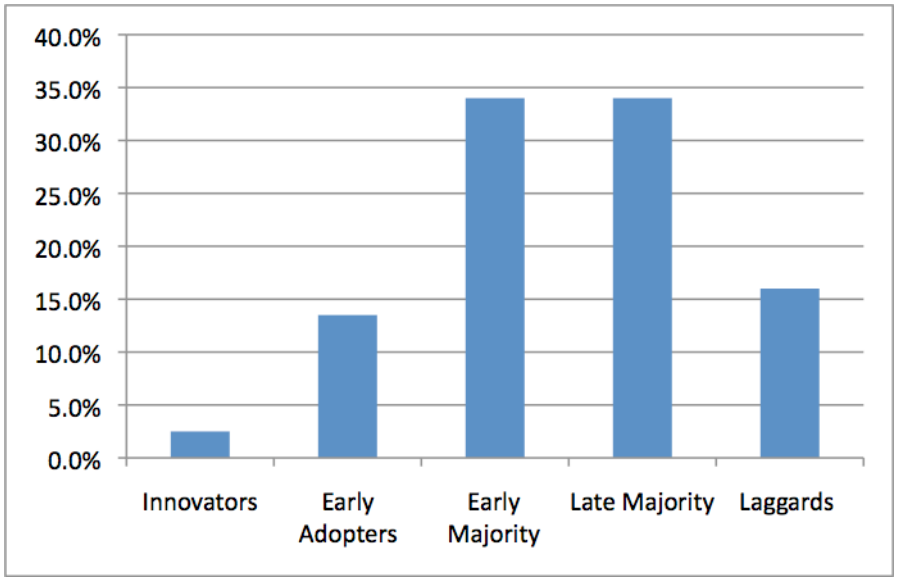

Figure 4. The process of diffusion of innovation. Adapted from the categories of innovativeness (Rogers, 2003, p.281)

The previously mentioned study by Smerecnik and Andersen (2011) on the diffusion of sustainable innovation within the North American ski resort offers an example of the strength of the theoretical framework. The authors quote Rogers on the diffusion of innovation theory (DIT) and expand on it. “DIT defines an innovation as an idea, practice, or object that is perceived as new by an individual or other units of adoption” (Rogers, 2003, p.7) “and is highly predictive of the adoption of new innovations by individuals and organizations” (Smerecnik & Anderssen 2011, p. 174). The authors again quote Rogers (1995) as follows, “DIT has been widely utilized internationally in various disciplines, with over 30 nations using DIT as a primary theory of development and with approximately 4000 published studies employing the theory” (Smerecnik & Anderssen, 2011, p. 174). Through the study of the characteristics of innovators in this study, this theoretical framework can also be applied to environmental sustainability within the restaurant sector.

Participants were interviewed on multiple occasions until data saturation took place. Three were interviewed twice; one participant was interviewed three times. Interviews averaged 36 minutes. For purposes of anonymity, the participant’s names have been replaced with letters and numbers designating the research sites, ABC and XYZ. As an example, one participant from the smaller ABC restaurant, was designated – Employee 1, ABC. The data were collected from November 15, 2011 through February 2, 2012. The data were then analyzed, coded, and categorized into themes.

Research Findings

Results for Research Question 1

What sustainable processes have been added or modified? What was it like going through the process? Questions 1- 6 in the interview guide (see appendix B) were designed first to list what environmentally sustainable practices have been put into place and second, with two different research sites used, to describe how the processes may differ in relation to context. Third, critical incidents that exposed challenges or opportunities for improvement in a process were solicited.

1. Process Added or Modified

Process a - Waste Streams

When asked what each location was doing to be more sustainable, all (100%) of the participants discussed sustainable waste streams in their answer. There were three different ways in which participants interacted with the waste streams. One participant indicated:

> We do a pretty good job - pretty serious program on the waste as far as composting, and the recycling. It's pretty - about as good as I have seen. (Chef, ABC).

Another participant stated:

> I know that some time ago, the operation really started pushing a recycling and composting initiative. Very, very important that anything that is compostable, including wood and cardboard, any biomaterial that can break down is to be separated from trash like plastic and metals that will not break down – will not biodegrade. Really keep those separate; the whole idea being that we produce so much trash at both hotels, in the restaurant, and in the bar, the more we can keep separated, and really turn that compost into good compost, we reduce our, I forget the exact number, but it's tons of trash that it will reduce (Employee 1, ABC).

Drawing from all of the interviews, what is composted includes: food waste in the preparation of the meal, food that was left on the plate by the guest, and any

items such as napkins, beverage holders, and flatware that are made from biodegradable materials. Recycling efforts included cans, bottles, plastics and plastic wraps, paper, cardboard, and wood.

The second situation involving sustainable waste streams occurred where the participants added to or modified the waste stream practice in a positive a fashion. Changes came from both management and employees. One participant describes a past additional waste stream that was once used in the summer months:

> So when I worked here years ago we used to do coffee grinds that we were doing for campus, but we are not doing right now. That is something that I think we should bring back. That was more in the summer time because I think they used it a lot for pigs and as fertilizer (Manager 1, XYZ).

Another participant describes how other items that were once discarded were reused:

> Some of the packaging, for example when fish comes in, it comes in big plastic tubs. There's not a recycling or any other program associated with it. But we honestly don't mind because we reuse the containers to store food in. So we don't just throw them – I'm sure a lot of people don't (Employee 1, XYZ).

The third smaller but notable situation involving sustainable waste streams occurred where value was created from a waste material. An example was offered by one chef:

> Same thing with – one thing has changed a little bit as far as fryer grease; we just went with another company. Before that, they were just taking it and they would take it for free so we wouldn't have to dump it or put it in the garbage. At this point, we are getting, I think it is $1.22 a gallon for the used oil, so that is fantastic (Chef, XYZ).

Process b – Local Food

The use of local food items was the second most cited (63%) sustainability endeavor undertaken by the restaurants. Local foods included vegetables, cheese, and meats. There was no clear understanding what *local* meant in terms of distance, with *within the state* being the most common description. One participant stated:

> On the purchasing side we are making some inroads like purchasing - like local. Let's put it this way, it's not that it is local, it is from Lancaster. So it is relatively local free range chicken, so that's kind of an organic product that we get in regularly. It's probably only about 30 percent of the total chicken that we order. So it's not a lot but, let's see, what else? We also get one cheese that we are getting in regularly, for again a menu item that is again local and organic (Employee 1, XYZ).

The chef from ABC restaurant summed it up:

> And then as far as sustainable, we, to some degree, try to focus on local organic production products and produce (Chef, ABC).

Process c – Compostable or Recyclable Materials

Some newer utensils and other items such as cups are being made from materials permitting recycling or composting. Corn-based materials are being made that can replace petroleum based ones, particularly in flatware. Additionally, more cardboard is being used to replace Styrofoam, also petroleum based, to-go containers. This third endeavor was noted by three participants (38%). One participant stated:

> Well yeah we do some green with our to-go packaging, but we are not 100% green. We do a lot of green with our coffee cups. Our cold cups are plastic and recyclable. (Manager, ABC).

Another manager commented on the same aspect:

> Well actually we have all of our to-go things, they're all recyclable or compostable. So all the coffee cups or anything to drink in, the packaging that we put the food to-go in, is also like, you can compost it. Silverware is compostable, the napkins. All

the napkins in our cafeteria area where our employees eat are also compostable. (Manager, XYZ).

Process d – Utility and Energy Usage

As noted in the literature review, restaurants typically consume the largest amount of energy per square foot when considered part of the retail sector. This is primarily due to the storage (refrigeration) and preparation (heating) of the food. Regarding energy or utility usage, the fourth effort, one participant noted it briefly (13%):

Change the lights out and make an effort to keep the lights out in the cooler and things like that (Chef, ABC).

He also touched on it regarding water usage:

Don't leave the water running. The little actions you can do by not leaving water running over the pasta to cool down for two hours (Chef, ABC).

Process e – Food Production Levels

The final issue, adjusting or giving more thought to such things as food production levels, including the chopping of lemons and limes for drinks before a shift started, was mentioned by one participant (13%). He stated:

And what we had recently implemented, where before we would just go back and get fruit, lemons, limes, oranges, celery, cherries, grapes, olives, all that sort of thing, and get them and bring them out. Now our manager has us write it down, what we take, what we bring to the bar (Employee 1, ABC).

He continued later:

So I think what she wants to do is to track a little more closely. It's either that she wants to track a little more closely what we are purchasing or using so we know how much to keep on hand (Employee 1, ABC).

To sum up, most of the attention, when asked about environmental sustainable processes, focused on waste streams and using local foods. The focus

that the waste streams received was noted by all. It was seen as a process that was continuously being improved. The local food initiative was the second most cited endeavor with the definition of *local* undefined. Newer items and packaging was the third most cited process and focused mainly on to-go materials. The last two, cited less, were energy and water usage and food production levels.

2. Uniqueness of Process in Research Sites

Results of the study indicated that setting was a determining factor in the degree of implementation of the environmentally sustainable process. Setting was revealed through the interviews to include size and layout, customer volume (being busy or not), and differences in the dining room operations versus those in the kitchen.

The actual physical size of the foodservice operation was seen as a differentiating factor in being environmentally sustainable. Small versus large restaurants and their varying forms or contact with environmental sustainability proved noteworthy. One participant from the larger XYZ convention operation described the use of leftover food as not too important in larger operations:

> Instead of gathering it up and maybe taking it to the break room where employees could enjoy it, or maybe we could turn it into maybe, like if there is lots of pineapple, maybe I could turn it into pineapple chutney or something like that. It just ends up getting dumped into the compost. And that's just one of those things, you know I have spent a lot of my career in smaller restaurants, so when I see that kind of product getting wasted it just gets my hair up. For a big production place like this, it's like it is just not - our food cost percentage is like, you know, it is just a drop in the bucket when I look at these things. And in a smaller restaurant, that's $50.00 in the garbage. For a big place $50.00 is nothing (Employee 1, XYZ).

The actual layout of the restaurant also proved important:

> Of course most kitchens were not designed to have recycling areas within the

kitchen. We have created them. I think we are pretty fortunate in what we have here. I mean we do have the space to put them (Employee 1, XYZ).

Regarding local foods, he noted difficulties as well in being environmentally sustainable in the large operation as compared to a smaller restaurant:

How in an operation like this do you tell someone that we don't have tomatoes in December when everyone else does? I've been in smaller boutique restaurants that can do that. They can get away with it because they are feeding their niche. But with an operation like this, it's very difficult to do that. (Employee 1, XYZ).

How busy an operation was also affected environmental sustainability. Three examples show its impact. One participant described the problems with turning off unneeded lights during busy periods:

I guess in small ways, like lights in the coolers, getting in and out of there. That doesn't necessarily work out. The lights are on during busy times. (Chef, ABC).

Another manager noted that during busy periods she was less able to monitor the waste-streams:

When you are busy and out on the floor, you're not back in the kitchen watching what they are throwing out and what they are doing. (Manager, ABC).

Another employee summed up how serving the guests in a busy period trumped environmental thoughts or actions:

One of the problems that we run into is that we find the biggest problems is when we are all so busy it is hard to keep up with anything. So I am worried about them meeting deadlines for service, am I gonna get all bent out of shape because they threw out some fruit that could have gone to the break room? So I am gonna make them spend 10 minutes gathering the food up, putting it in a bowl and taking it to the break room? No I'm not gonna do that because I have more important things to focus on. (Employee 1, XYZ).

The front of the house (ding room) and back of the house (kitchen) also handled sustainability differently. While the front of the house is focused on direct customer interaction and is sometimes compared to the theatre due to the show being given to the guests by their individual server, the back of the house is traditionally a team that operates behind the curtain and is not in the customer's direct view. The Chef from ABC described the difference in food not being composted:

> The kitchen is not much of a problem. When we have, the front of the house is more independent people. They work more independently than the kitchen does. The kitchen works much more as a team, that's just the nature of the business. Because people are working side by side, when they are bringing things back they are not bringing it back in teams. As far as on a tray, it would be one person bringing it back and it is very difficult to catch who is throwing that stuff in there. It does happen. I say we are working on it, but it is a challenge (Chef, ABC).

While the back of the house was seen to handle food waste better according to the chef, another front of the house manager from the other research site noted how front of the house employees (wait-staff) can drive sustainable sales in talking about the local food movement again:

> We have free range chicken that is from Lancaster, so it is still pretty local to me, only a few hours away. So that is something that is something that is going over very well. The employees obviously all talk to guests when they order it and let them know that it is local free range. Guests tend to like that and we sell more of it (Manager, XYZ).

To sum up, while larger operations could handle the addition of new sustainable waste streams, such as new buckets in the kitchen, waste was less noticeable due to high volume. It was also, more difficult for a large operation to be more environmentally sustainable when using local foods, due to larger customer volumes and a varying clientele base. Additionally, during busy periods

sustainable or green thoughts diminished in importance in both locations. Serving the customer(s) in a timely manner took precedence. Finally, the front and back of the house interacted with environmental sustainability in different ways. While the back of the house handled waste streams more effectively due to the team orientation of the kitchen, the front of the house servers were able to sell or *push* the local foods due to their direct interaction with the customer.

3. Critical Incidents

Much can be learned from the processes in context. As noted in Chapter 3, Flanagan's Critical Incident Technique can be applied to hospitality, "CIT lends itself particularly well to research in individual operational units or groups of units with similar characteristics" (Callan,1998, p. 93). The fact finding portion of CIT was used in this study in answering, what was it like going through the process? Certain events concerning the processes detailed earlier (waste-streams, local foods, biodegradable items, energy usage, and food production levels) displayed noteworthy challenges in the environmentally sustainable procedures. As seen in the theoretical framework, both restaurants are seen as innovators in environmental sustainability, and as such, others can learn from both their actions and from how problems were resolved.

Critical Incident 1- Waste Streams.

Composting and recycling were completely shut down for two months due to fruit flies. The chef from XYZ described the challenge:

What didn't go well was late last summer, early fall where we were getting a lot of fruit flies. We stopped composting. First, we put in a smaller bucket and we weren't capturing as much. As far as plastic containers and cans, we were getting a

lot of bugs with that as well, a lot of flies, so we were throwing everything out as well. We were back on track for maybe three or four weeks now. For the first week it was a little difficult getting everyone back in the system again. We are still not a 100% where we were, but we are getting close. (Chef, XYZ).

Critical Incident 2- Local Foods.

Another example detailed how local food purveyors are less reliable than big food companies:

I tried to get in the door here a local pork farm. We would love to use more of his product, but when we order from him, we always tack on an extra day because sometimes it doesn't get here on time. So we'll order it to come on Wednesday even though we know that we don't need it until Thursday, because we know he may not get it here until Thursday. So it's kind of one of those things. (Employee 1, XYZ).

Critical Incident 3- Compostable or Recyclable Material Usage.

The use of sustainable materials in the operation also displayed challenges. One participant described the difficulties with the compostable to-go containers:

Because they are cardboard material. It works well for sandwiches and stuff, but for anything that is a little bit moist, it would kind of just soak through the containers. So they are like, well we need something more to go along with that. (Employee 2, ABC).

Critical Incident 4- Energy Usage.

An incident involving energy usage, in this case lighting, provided an example of how one chef combated employees not tuning the lights out. Succinctly put, he stated after his staff continually forgot to turn the lights out in the cooler:

Turn the ******* light out! (Chef, ABC).

Critical Incident 5- Food Production Levels.

A critical incident involving the process in food production levels detailed how past volume levels influenced future preparation of certain food items often incorrectly. On participant stated:

> A lot of times we are very busy over football season and other certain weekends. A lot of times we will gear up on all of our products for that weekend and that kind of carries over on the slower weekends where people get in the habit of doing and preparing a lot of stuff for a busy weekend. (Employee 1, ABC).

In sum, each of the processes had challenges. For waste streams, fruit flies were able to shut the recycling and composting down, while in local food usage it was noted that often the farmer was less than dependable. Green materials such as to go containers often leaked due to their makeup and a chef was reduced to yelling to remind his staff to turn the lights out. Finally, in food production levels, often the staff would prepare too much food for non busy periods.

Results for Research Question 2

How does management affect environmentally sustainable restaurant initiatives within the restaurant? How do employees affect environmentally sustainable restaurant initiatives within restaurant? These questions were answered through questions 7-12 in the interview guide (Appendix B).

Research question 2 investigates how these practitioners, seen in the theoretical framework as innovators, affect environmental sustainability within their daily job function as reported by the participants. The first part details

environmental sustainability results within managerial roles. The second part details environmental sustainability within employee actions.

Management

Managerial Role 1 Training.

Training was the first most cited managerial role in affecting environmental sustainability. Many restaurants face the challenge of high turnover rates in their staff. One manager put sustainability within that context:

> They're less, because they're students, they're kind of in and out, and they don't stick around for very long. I think they're less likely to deeply care about their jobs or about what they should be doing, or about how sustainable it is. So it's kind of more, it needs to be passed down from above, versus another job where you have people there for years on end (Manager, ABC).

She continued later:

> Because they are all young and not necessarily taking their positions very seriously. They just kind of gonna do the bare minimum of what's expected from them. So the bare minimum needs to be set pretty high for sustainability (Manager, ABC).

The chef from the same restaurant viewed turnover from his position:

> Just turnover, it's the biggest barrier. Back of the house there is much less turnover than front of the house and that would be a reason as well (Chef, ABC).

Given the turnover challenges, employee 1 from the XYZ restaurant concurred that any training needed to be top down and an important managerial role:

> I would imagine that if we were to try to get some kind of sustainability initiative more than we do now, than it would have to come from the top down. And then the managers would have to be the ones doing the training (Employee 1, ABC).

As an example of some of the training, the front of the house manager from XYZ detailed how she trains a new server on the waste-streams:

Ok, so like if I were training somebody, so basically their day would be to come in and the very first thing you would do as a trainer is take them through the restaurant. And so to me taking them through the restaurant, to me, that is the very first thing I would do. Like I would take them down and say this is where we recycle, all the cardboard in this box. It has to be broken down. This is where we do all the recyclable bottle and cans, and it tells you on top where they go. And this is where we do the compost. And I would simply explain to them what compost is, what goes in it and what does not go in it (Manager, XYZ).

Most of the employees recommended that management infuse environmental sustainability within basic new employee training. In other words, they wished management went a little further than just explaining how to do it. Employee 1, ABC continued:

If you are trying to teach or maintain a sustainability initiative or any other kind of initiative, if you are pushing it down somebody's throat daily, expect to get push back. It's a monthly, it can go bi-monthly, but I think the most important aspect is at new hire orientation training. Saying this is what we do here, this is the environment that we create. This is our culture. And in order for you to work here and fit in, you have to buy into this culture. And we are going to train you, train this into you, right from the beginning (Employee 1, ABC).

Employee 1, ABC continued with a Disney example:

Disney does a great job with that. They let you know right up front during the interview everything that is expected of you and things they don't allow. And if you don't want that, you don't buy into it from the beginning; you go and look for another job. Once you say OK or yes, I buy into all this and I agree with this and I like it, then six months down the road that's outside of their parameters, they can let you go or just say, 'hey you agreed to this from the beginning.' So I think that is real important. Just from the very beginning, saying that this is our culture and this is our environment. This is what we expect. If you don't want that, if you don't buy into it, you can go elsewhere (Employee 1, ABC).

Explaining the benefits of sustainability seemed particularly important to the participants in any training that is done. The same participant described it:

Convince the employees that, well have them convince themselves that they're helping each other, they're helping themselves, they're helping their friends and

family because they live locally. You know they are not traveling five hours to come to work here, so they are absolutely going to be friends and neighbors of people that will benefit from us purchasing locally. So if they are convinced of that, and then they can actually help drum up business if they can find some local purveyors that might be able to come and sell to us.

It was also very important to management that employees be knowledgeable about any local foods on the menu, particularly the wait-staff. One manager stated:

Okay, so like I think internally, like talking to the staff, training the staff and how to discuss with the guest, like you know when they are asking certain things on the menu, like our lamb, also a local product, discussing with them where it comes from, about the farm and maybe about the chicken as well (Manager, XYZ).

Benefits that could be mentioned during training also included nutritional aspects as another passionate participant stated:

I think that you would need to show them for instance. I am a big advocate for this. This is one of my hobbies, to keep up with this stuff. So if you were to be able to show people that okay, here is a study from the 1970s that show the nutritional value of broccoli, and comparing the nutritional value to now, you see that it's a fraction of the nutritional value because of the factory farms. They're a monoculture. They don't rotate their crops. The soil is being depleted and you can't get the same product. Compare that commercial broccoli to organic broccoli and you see the nutritional difference. If you can show them these facts, how can that not start to sink in (Employee 1, XYZ).

Summing up, training was seen as paramount in affecting environmental sustainability within each location. Each restaurant had challenges with turnover and agreed that sustainability should be included and emphasized during first day training. Many employees wished that management went a little further and demonstrated that sustainability was part of the culture. Finally, knowledge of both waste steam usage and local food knowledge, including origin and nutritional aspects were deemed important.

Managerial Role 2 Purchasing.

What is purchased in the restaurant dictates what is to be prepared, stored, used, and consumed. Purchasing was the second most frequently cited managerial role in furthering environmental sustainability in the restaurant. One participant described the chef's importance:

> I would say the main person responsible for sustainability would be the chef because he is at the top of the food chain. I'm responsible to an extent and I would imagine that all the managers really would be to an extent. The General Manager here, they are all responsible for implementing these kinds of decisions (Employee 1, XYZ).

While buying food may seem obvious as one of the chef's main functions, the purchasing of cleaning supplies may seem less so. The chef of XYZ restaurant describes some of his efforts in purchasing eco-friendly cleaning supplies:

> One of our cleaning supply companies came out with a new product which is a chemical that is wrapped in its own wrapper but we came to find out that it is much more expensive product as well. So anyway we switched for about a year and just very recently we saw that our cleaning supply costs had gone up to about $8,000 this year, we went back to the company to find out what was going on. We ended up switching to another product which is the same product inside but is not marketed as eco friendly (Chef, XYZ).

The chef possessed a working knowledge of what he had bought in the past and continuously used that information in making future purchases with price as the dominant factor. When considering a new more eco-friendly cup, he found that re-useable plastic cups were cheaper and in his mind more green than compostable, one-use cups.

> The same thing with eco-friendly cups. The disposable cups that we were using for our cafeteria, we were using disposables, but those cups, especially when they were first coming out, they were about 35 cents apiece. So we switched to a less expensive reusable plastic tumbler (Chef, XYZ).

When purchasing foods, price points were not the only consideration that the chef used when purchasing, or not purchasing, local foods. Recalling that XYZ restaurant was successful in offering local free range chicken, one participant explains what the chef was able to negotiate:

> One of the reasons that we have this free range chicken on the menu is because we can get it easily and regularly. The price point is very close. Maybe it's a little bit more per pound, but not much, and the flavor is far superior. So between all those things that is why it is on the menu (Employee 1, XYZ).

Front of the house management also, although to a lesser degree than the chef (back of the house), played a role in purchasing as well. As an example, the manager from ABC investigated what new options were available for new soup containers.

> I don't think the suppliers are as green friendly as where they need to be because I know that I had called a supplier on certain soup cups to go because right now we are using plastic. I thought a paper cup, the kind with the coffee or what not might be good. But right now they only have squat. So we don't have a paper soup cup. Yet (Manager, ABC).

In summary, management at both locations was involved in the purchasing function with the chef playing the dominant role. Through their knowledge of what would work in the restaurant, sustainable options were considered first but only adopted if they fit into the operation. Importantly, management did not stop looking for environmentally sustainable options.

Managerial Role 3 Operations.

The third most cited management role that affected environmental sustainability was in the actual daily operation of the restaurant. Managing staff

during the restaurant operation included many areas that affected environmental sustainability detailed by the participants.

First, having management setting the proper tone or leading by example seemed of particular importance to the participants. One employee stated:

> What I really think management needs to do is create an environment where 1) they practice what they preach, they're doing showing, and leading by example and 2) creating an environment in which it is acceptable, it's desired, it's fun – you know whatever it might take, create an environment where people want to buy in and want to be part of a sustainable initiative. (Employee 1, ABC).

Second, with a similar sentiment in mind, the Chef from ABC hoped that this feeling would translate into something positive:

> So when these employees are not under direct supervision, making those decisions to turn off the light or not throw that can in the garbage and taking the extra time to put in the effort into something that can be recycled, and you know just making those small decisions that could add up over time in conjunction with others (Chef, ABC).

Third, imbedding environmental sustainability into the operation was seen as an obvious solution to many of the participants. Both chefs stated making sustainability a habit would help in furthering sustainability. Chef, ABC stated:

> It is always an extra step if not a habit (Chef, ABC).

He continued later:

> I think it's just talking about, and being proactive about it, and just trying to break habits. I don't think that it is any, it's not a beating, disciplined type of thing. It's just more of a general awareness. If that can be instilled, then you have less problems. Then people will find their own ways of figuring out if you can instill that in them (Chef, ABC).

The Chef from the convention center stated similar notions. Here he showed how an environmentally sustainable habit could be created much the same way as creating a recipe:

Now it is just part of the routine. They're used to it. They've done it so many times. That's just how it is done. Just like when you are making sauce, if you are adding your wine, you deglazing something, you're letting it evaporate, that's just how you do it. It's the same thing with compost (Chef, XYZ).

Fourth, while setting the proper tone and inducing good habits was hoped for by most employees and management, consistency was cited as well. One manager described it:

I think probably the only thing I would do, if I see the students, or whoever, throwing the wrong thing in the wrong receptacle, you address it. You have to be consistent with what you see going on. "Who threw these flowers in here?" "They go in here." Things like that (Manager, ABC).

The same manager used consistency in her closing statements as well:

I can't think of anything else. I mean except for making sure that everyone is throwing things away in the proper containers and doing what they have to do (Manager, ABC).

In research site XYZ, management held similar views:

I think just stay on them and keep repeating, like explaining to them, like we need to do this, this is very important that we do this. It's good for the environment. It's something we need to pull together to do, and just really stay on them. Some people if they are really busy would just throw plastic in the garbage, and I would go, "Is this where it goes?" So you don't want to treat them like a child, but in some sense you have to (Manager, XYZ).

Finally, visual aids provided by management were also mentioned by a few employees as being helpful. Composting was seen as a newer initiative and not quite understood as well as recycling. Proper signage made and displayed by

management and employees aided in its correct use. One employee from XYZ explained:

We have throughout the operation, I don't know what you would call them, like murals or posters that separate what can and cannot be composted and recycled just so people have to reference because some-you know we separate stuff like that (Employee 2, XYZ).

Another employee from the other research site gave a more detailed description:

One of the stewards, what he did was he created a board and cut it in half. On one half he taped up paper products and any other thing that could be composted and said "This is compost." And on the other side, he had plastic and metal wrappers, those sorts of things, and he put those up over every trash area. I thought that was a very good process (Employee 1, ABC).

In summary management was able to affect environmental sustainability within daily operation through setting a proper example and making environmental actions a new habit within the operation. Being consistent and staying on top of staff in waste stream usage was important and was aided by signage.

Managerial Role 4 Marketing.

The final managerial role affecting environmental sustainability cited was marketing. It seems that while participants were aware of the many initiatives that were being undertaken within the confines of the restaurant, how these environmental offerings were communicated to existing or potential new customers was only understood by a few. References to marketing were only made by one employee and in the larger convention center location. Employee 1, XYZ stated:

The Gutessa cheese is that local cheese that we have on the menu and we put it out. The dish is what we have put it out in our latest newsletter. So that created a little bit of buzz. When I have seen people out and about, and they say 'hey I saw you in the newsletter, I saw your recipe, I love that cheese" and we'll have to come in and try it out. So I do think that when we try to get some of these initiatives and when people are aware of what we are doing, they do embrace it (Employee 1, XYZ).

He continued later commenting on reused bed boards in the wider hotel setting:

We have heard comments about like a few years back, they took full baseboards or whatever, the back of the bed, and they took those and turned them into recycling bins around the hotel. So it was kinda like reused you know, and we got a lot of great comments about that. So the awareness is there and I think when people see it they appreciate it. But whether or not the people in our market are making decisions about where they are going to eat that night because of it, I don't think we are there yet (Employee 1, XYZ).

Summing up, of the four managerial roles cited by the participants, marketing received the least amount of emphasis and consisted of a newsletter and the use of reused materials.

Employees

While management's role within environmental sustainability was widely noted, employee actions, although less, were also detailed. As the front line employees to the guests, and importantly, with each other, sustainable initiatives were depicted as more hands-on and described by both management and employees.

The most cited employee action on how they could affect environmental sustainability was peer policing. With employees outnumbering management in a dynamic environment, how they interacted with one another around sustainability issues proved important to the initiatives. One employee explained how he handles incorrect waste stream usage by a peer.

If I see somebody throwing aluminum cans in the trash, I'll say 'Hey Joe, why aren't you recycling that?" Or, 'Why are you putting that metal in the compost, because you know the guys that do the composting are going to have to pull that out?' So it's sort of self monitoring, peer pressure on the job site to increase sustainability (Employee 1, ABC).

With the kitchen being a cohesive unit, one chef commented on how his crew operates when a best practice on sustainability is not followed:

> They see it happening and stop it and older encourage the young and the more experienced to the less experienced (Chef, ABC).

Oftentimes new employee training was done by a fellow employee. Peer training closely followed peer policing and was the second most cited action that employees took. One server described how given that being sustainable may seem outside of one's job description she tries to train new employees on its importance:

> When I train people there, I do make a point to say, "Oh be sure to recycle these things. We end up with cardboard when we bring up boxes of stuff, and I always make a point to save the cardboard and bring it to recycling, but that's just an extra effort and most people don't do that. When I train people I encourage them to do stuff like that and go a little extra step (Employee 2, ABC).

Another employee, after stressing that the importance of nutrition said he often had training like conversations with his fellow co-workers on the benefits of serving local organic foods. He stated:

> If you can show them that commercial beef is higher in saturated fat, it's got all the Omega sixes and all those things compared to grass fed beef, that has CLA which is fighting heart disease and this and that and it has Omega 3 fatty acids. And you show them that it's like – I try to tell people (fellow employees) when they ask me about it and I say well, look at commercial beef like Wonderbread as grass fed beef is to whole grain (Employee 1, XYZ).

The third most mentioned employee action around sustainability involved communicating new ideas. With environmental sustainability in foodservice being a newer endeavor, new ideas can come from different origins. As one employee explained it:

> You have to communicate these ideas out and I'm not saying in a downward, hierarchical manner, but just that all employees are responsible for communicating

to one another and up to management all of these ideas at all times (Employee 1, ABC).

Recalling that one manager was trying to find a compostable to-go cup for soups, and the problem with the leaking cardboard to-go containers, one employee commented on the compostable cups used in the employee break room:

> In the break room they have corn-based, plastic looking cups for when you are getting drinks and stuff. So I would think that could use the same material and get to-go containers that would hold moisture much better (Employee 2, ABC).

As discussed in the section uniqueness of process due to setting, servers are the ones who push or sell the food. This was the final employee action in environmental sustainability. A front of the house employee provided another example of how through a server's influence, more sustainable goods could be sold:

> You know if I as a server or bartender can convince 50 people to order the bison burger instead of the beef burger, and explain to them that the bison burger is coming from a sustainable farm and I get 50 people to order those burgers than we are going to purchase more of those burgers over time from that farm (Employee 1, ABC).

To summarize, many employees affected environmental sustainability within the restaurant through peer policing and peer training. Additionally, these employees believed in the widespread sharing of new ideas and guest communication.

Results for Research Question 3

What effect, either positively or negatively, do outside entities have on the additions or changes in the process? These questions were answered in question 13-17 in the interview guide (Appendix B). Any organization has external entities that

affect its doings. Restaurants are no exception. The following details the results, according to the participants, of any outside bodies affecting environmental sustainability in the restaurant.

Customers

It was no surprise to find that the rules of supply and demand applied to environmental sustainable initiatives within the restaurant. Customers drive what is used. Customers were the first most cited outside entity. All participants mentioned their importance in their answers. One participant describes it in the context of sustainability:

> Customers, yeah customers. I think that, I think the main thing is customers supporting their local restaurants. I think that really helps or is the main thing, one of the main things (Manager, XYZ).

The chef from ABC stated that many local items in the restaurant and in his side job in his food truck were dependent on customer demand, particularly regarding newer food items:

> I believe in the long run it will bear fruit. The people that come to my restaurant or my truck and they taste it, they are loyal to that because they can feel it. But if it doesn't turn around quickly enough I won't make it. I need that support (Chef, ABC).

He continued later on the opportunity for success:

> And then if you are doing the right thing, and meeting the right people, you will be rewarded by your customers for doing that (Chef, ABC).

Customers desiring sustainable products also came in large groups and were served accordingly in the convention center. One participant described an event:

> One of the groups we have is a very good group in that they want everything in, they don't want us to use plastic wrap. They would rather use waxed paper. We use brown bags. So they are always thinking about that. We had a couple of groups

asking what our practices were before they even came in. We usually do very well with that (Employee 1, XYZ).

In the smaller Inn, sustainable behaviors were seen by certain customers as well:

Well sometimes people come in and bring their own products - silver and containers and use the same plate throughout the meal (Employee 1, ABC).

Customers come with different desires, and not all embrace environmental sustainability. While most of the participants described their customer base as being progressive, other types existed in their eyes as well. One participant described her clientele in the context of sustainability:

I don't think it is 100%. I think a lot of people aren't. I think a lot of people don't care, sometimes about it as well. They just – it doesn't matter to a lot of people. But I did find that working here, more people do care about it (Manager, ABC).

Finally, some of the participants commented on how customers could offer new suggestions as could anyone working in the restaurant. One participant described it:

If there is something that they have seen in their travels elsewhere that they think could help us be more sustainable, let us know (Employee 1, ABC).

In summary, customers were the most cited outside entity affecting sustainability in the restaurant mainly trough ordering local foods. Additionally, some large groups and individual customers wished for sustainable practices within the restaurant. Finally, while all customers may not embrace environmental sustainability, many may have good ideas for the restaurant.

Competition

Secondly, and close to the concept of customers, many participants spoke of competition. Competition took many forms, not just from other restaurants, but from any place where one could purchase food. While the concept of the restaurant is evolving, with many retail chains becoming competitors particularly in prepared foods, it was apparent that the participants viewed competition with a wide lens with price playing a major role. One participant described the current situation:

It's the whole Sam's Club, Wal-Mart thing. It's like I wanna buy local and I wanna support the US, I wanna buy Pennsylvania products or whatever. But I can go to Wal-Mart and buy something that is made in China that is just good for 50% less. How can I justify not buying that (Employee 1, ABC)?

Another employee commented on another restaurant's price points.

They buy in such huge bulk that they can do that. Are they practicing sustainable fishing? I doubt that. So here you are you are competing with someone who is not sustainable. So it is an unfair kind of playing field or whatever. So that's part of it. (Employee 1, XYZ).

Another participant added convenience to price:

People want to save a buck. They you know, they want more for less money. People in our society, it is more about fast food. It is like an easier thing, instead of actually wanting something that is healthier for you (Manager, ABC).

While many of the participants shared the sentiment that cheaper less sustainable competition was a negative, others saw competition that embraced environmental sustainability as a positive. One employee stated:

If five restaurants are working in the area and four of them decide to be sustainable, the fifth is probably not going to be patronized as much, I hope anyway (Employee 2, ABC).

An employee from the larger convention center echoed the sentiment:

I would say that if another conference center came in they were doing it, beating us, that would work (Employee 2, XYZ).

Whichever the case, some employees stated the importance of the current economic environment and placed it within the context of the actual business of a restaurant. A manager summed it up:

Organic costs more. I do believe that people want to do it, but I also believe that people want to save. They don't want to spend the money. I think they really, their number one complaint is how expensive food tends to be in the restaurant (Manager, XYZ).

In summary, restaurant competitors were broadened to include retail stores, and price points were important. Lastly, competition that was environmentally sustainable was viewed as a positive.

Government

The third external body mentioned by participants was government. It seems that sustainability is very much in the political news and within different contexts. Within foodservice sustainability, there was a general feeling that there was no real current government role. As stated earlier, the definition of *local* in local foods has no formal definition. How much restaurants benefit from government is debatable. Current restaurant interactions with any government organizations may revolve around food inspections, labor issues, and taxes. Not surprisingly, no one participant was overly enthusiastic about any current or possible future government role but saw its involvement as a possible plus. I decided to leave personal politics out of the conversation and dug a little deeper into what role it could possibly play. As one manager put it:

I think if the government, although I am not a real government kinda girl, took over something like this and made it so we had to do it and people had to do it, then yeah (Manager, ABC).

The sale of food can be dangerous due to possible food borne illness. Many regulations exist that require insurance. One of the chefs who believed that the government had a role pointed out some unintended consequences of insurance regulations on the small local farmer:

Some of these regulations they're throwing on are really tweaking the flow of the farmers and keeping them out of markets because they are organic and certified but not this certification. It's the large production that can afford this stuff (insurance). I think that type of regulation is just of – I see its purpose, but it is kind of clunky, misguided (Chef, ABC).

Rather than regulations, certain participants stated the success could come from the government in the form of incentive programs. One participant put it:

What would probably work best, I would imagine would be incentives as opposed to like fines or penalties. I think that would be very difficult to get, but incentives, if there were something like, if we were to produce so many pounds of recycled product or compost product, that we would get so much grant money or something like that (Employee 1, XYZ).

Importantly, many of the answers concerning government incorporated the aforementioned entities of customers and competition in their answer. One participant stated:

I think if customer demand shifted to sustainability and the government had some kind of community agency – not even necessarily government, but a community agency that could clarify what is sustainable, not just some guy carrying produce saying he is sustainable, then these two could meet in the middle (Chef, ABC).

Finally concerning the role of government, the same chef stated that it could play a role in educating the consumer in knowing what local foods were available when:

Maybe it's an education of them because somebody may not know what is growing that time of year. So it might be somewhere where government could step in and be more in the education system (Chef, ABC).

In summary, while most of the participants were skeptical of government, some believed that it could play a positive role. Incentive based programs and firm definitions were sought as a well as a possible role for government in sustainable education.

Farmers and Other Vendors

With local foods a large part of sustainable restaurants, local farmers and other large vendors were frequently mentioned, many times in comparison. Most of the participants felt that the local food movement lacked the infrastructure that major food purveyors possessed, thereby hampering sustainability. One participant with over 14 years of working in kitchens described it:

Well, here you have chefs that don't get paid that well. That's just the nature of, we do this because we love it or it's what we have fallen into or whatever. It's not because we get great salaries or great benefits. We work long hours, high stress, you know whatever, so you've got a chef who is working on 16 hours and he has got to get his product in for the next day. Do you think he is going to make six phone calls to local purveyors trying to find all of his product or is he going to call one person and get it all? That's what happens. So the idea is they are going to call one major food supplier and order all of their produce, all of their fish, all of their meats, everything and hang up the phone or they are going to be chasing purveyors around (Employee 1, XYZ).

An earlier critical incident described how local farmers could be unreliable compared to the major food suppliers. There was a genuine feeling among many

of the participants that the local farmers just didn't understand the restaurant business. The same kitchen employee continued:

> We have another farmer who will tell us hey I wanna get you guys tomatoes for that big event coming up. And we are like okay, we'll be ordering those on Wednesday to come in for Thursday so we have them to start producing on Friday, (for) Saturday. And he comes rolling in on Thursday, and we're like dude we ordered them from Big Food Company yesterday. We don't need them now so there is just a disconnect (Employee 1, XYZ).

Most of the participants also understood common seasonal challenges for local foods. Winter can shut down local foods. However some were working with other farmers who were using newer growing methods involving green and hoop houses to extend the growing season. One participant described it:

> He is wrapping up the season. He has been able to grow in his green house up until last week (December). He can do that every year the way he has his greenhouse set up and he told me he is going to be building another greenhouse. But again it's seasonal (Employee 1, ABC).

A common feature around farming was the higher price of local organic foods compared to other alternatives. As detailed in chapter two, organics typically cost more due to the economies of scale used by big agriculture, and the fact that not using chemicals can reduce yields. One manager demonstrated that the solution was shopping around:

> So like trying to, shopping around from farms with different prices, like the local farms. Cause some people are less expensive. I mean there are tons of people that do farmers markets and are like really inexpensive, and then there are people that are really expensive, when it's pretty much the same thing. It just depends how or large your farm is. So you just use the place that you can find the best price, and that will not help in you needing to raise your price so high that people don't want to support it (Manager, XYZ).

Finally, the same sense of community, found in many of the comments on the customer, was also applied to farming. The chef from ABC summed it up:

> That's something that I am working on. I mean it's not just one farmer, one restaurant or it's not restaurants versus retail. It's kind of got to be community that supports a community (Chef, ABC).

In summarizing, while local farmers play a significant role in restaurant environmental sustainability and have extended the local growing season, oftentimes the local farming option lacked the infrastructure compared to the incumbent food vendors. On other occasions, it was apparent to the restaurateur that the local farmer also lacked an understanding of the restaurant business. Lastly, with seasonality and price being issue, a sense of community was offered as a solution.

Chapter Summary

This chapter presented the results of the study. Each research question is summarized in table form in the following section.

Research Question 1

What sustainable processes have been added or modified? What was it like going through the process?

Table 1. Summary of Processes and Examples of Critical Incidents

Process	**Critical Incident**
Waste stream (Recycling, Composting)	Fruit flies during the late summer became so intense that composting and recycling were shut down for a month.
Local Foods	A farmer delivering a product late.
Sustainable Materials	Cardboard to-go packaging often leaked.
Energy Usage	Chef yelling to turn the lights out.
Food Production Level	Prepared food levels for a busy weekend when it was not busy.

Research Question 2a

How does management affect environmental sustainability initiatives within the restaurant?

Table 2. Managerial Roles and Description.

Managerial Role	**Description**
Training	New employees; make part of culture; both waste streams and local food knowledge needed.
Purchasing	Chef led; must fit within operation; ongoing process.
Daily Operations	Role modeling; making it a habit; being consistent; useful waste stream signage.
Marketing	Less used; newsletters; reused materials displayed.

Research Question 2b

How do employees affect environmental sustainable initiatives within the restaurant?

Table 3. Employee Actions and Descriptions.

Action	**Description**
Peer Policing	Observing waste steam usage by peers; taking corrective action.
Peer Training	Helping peers understand waste stream usage; encourage to go an extra step; help with local food knowledge.
Communicating New Ideas	Share new ideas with peers and management.
Selling Sustainable Foods	Inform customers of local food offering.

Research Question 3

What effect, either positively or negatively, do outside entities (e.g. government) have on the additions or changes in the process?

Table 4. External Entities and Description.

External Entity	**Description**
Customers	Customers drive sustainability through the ordering of local foods; are individuals and large groups; may have good ideas.
Competitors	Cheaper unsustainable food a threat; similar offerings could help.
Government	Views were neutral to negative on the role; incentive programs could work; term *local* needs definition; possible role in education.
Farmers and Vendors	Small farmers lacked infrastructure compared to larger vendors; some lacked understanding of restaurant business; sense of community a possible solution.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

> Open up lines of communication with the community, employees, with other restaurateurs; just don't close off any ideas. Sustainability initiatives, good ideas could come from anybody at any time. Act on it. If it doesn't work, then throw it out and find something else. We're entering a whole new world. There are going to be a lot of growing pains. You just gotta be as flexible as possible (Employee 1, ABC).

The above comment from one of the participants demonstrates the newness, importance, and wide scope of environmental sustainability within restaurants. To address this topic, the primary purpose of this study was to investigate factors that contribute to environmentally sustainable practices in the restaurant industry. The secondary purpose of this study was to investigate how these practices can be implemented into the operation. Chapters 1 through 3 introduced the research questions, reviewed the literature, and presented the methodology used for data collection and analysis. Chapter 4 detailed the findings of the study. This chapter, provides a study overview, presents a summary of the findings, links the study results to key literature, and proposes recommendations to researchers, management, and practitioners (employees).

Study Overview

From a concern of global warming to a more thoughtful use of resources, environmental sustainability is being embraced by some leaders in the restaurant sector. With 35 million tons of rotting food waste per year (Jones, 2005) from the commercial food sector producing methane, a much more powerful greenhouse gas than carbon, as one example of unsustainable consequences, many initiatives within the industry are beginning with the environment in mind. Newer organizations concerning themselves

with environmental sustainability have been formed, and many different sectors are taking the environment into account in their business practices.

Two related industries that have started to make environmental strides are the agriculture and hotel sectors. According to the Food and Agriculture organization of the United Nations, 25% of the GHG emissions are caused by deforestation (2005, para. 1). With agriculture responsible for much of deforestation, greener practices known as sustainable agriculture practices (SAP) have been introduced into some farming operations. However, use of less fertilizer and pesticides, both seen as harmful to the environment, can reduce crop yields. While many advancements in sustainability within the agriculture sector are taking place, much more needs to be done: "Despite the attractive alternatives that sustainable agriculture represents for many farmers, widespread adoption of sustainable agriculture practices (SAP) has not occurred" (Rodriguez, Molnar, Fazio, Sydnor, & Lowe, 2008, p. 67).

Switching to the hotel sector, a Cornell University roundtable discussion in 2009 revealed that a noticeable shift towards sustainability in the hospitality industry began in 2005 (Zhang, Jogleker, & Verma, 2010). Hotels, much like restaurants, come in different sizes and levels of service. Often they contain food and beverage outlets within their operation. Importantly, like restaurants, they serve customers who expect a certain amount of goods and services for their money. While sustainability in the US hospitality sector (including restaurants) began in 2005, it is noteworthy that in Europe, it started a decade earlier. Today, on both continents, many current sustainable hotel practices revolve around energy and utility usage and guest amenities.

In the restaurant sector itself, the Green Restaurant Association and National Restaurant Association offer environmental advice to outlets in the United States, with the Sustainable Restaurant Association doing the same in Europe. Unfortunately, very little research exits in the restaurant, food service, hospitality, and workforce education literature. While local-foods, a major component of environmentally sustainable restaurants, are covered in literature, it is from a farming rather than restaurant perspective. Arguably, as restaurants begin to enter into environmentally sustainable initiatives, the need for research is timely.

Recalling from Chapter 2, innovation has been seen in the restaurant industry before, including the introduction of healthy foods. The transfer of knowledge from Kellogg, Post, Wallace, and others led to the adoption into the American society of newer, healthy food items and habits. As proof of their success, many of their products and environmental lifestyles are still seen today. What were sought in this study were such innovators who focused on environmental sustainability as a whole within the restaurant industry.

To this end, the primary purpose of this study was to investigate factors that contribute to environmentally sustainable practices in the restaurant industry. The secondary purpose of this study was to investigate how these practices can be implemented into the operation. This study investigated restaurant practitioners in both managerial and employee capacities in two research sites. Much like how the aforementioned food innovators furthered healthy foods into the entire American culture, these research sites serve as examples of environmental sustainable restaurant innovators for the food service industry. One research site is a small inn–style restaurant, while the

other occupies a large convention center. Both the kitchen and dining room operations were considered. To address the purpose of this study, the following research questions were used:

1. What environmentally sustainable processes have been added or modified? What was it like going through the process?
2. a. How does management affect environmentally sustainable restaurant initiatives within the restaurant?
   b. How do employees affect environmentally sustainable restaurant initiatives within the restaurant?
3. What effect, either positively or negatively, do outside entities have on the additions or changes in the process?

In answering these questions, a qualitative methodology was used with certain case study aspects to provide thick, rich descriptions. According to Creswell (2007), qualitative research is used to develop theories when partial or inadequate theories exist for certain populations or samples. Given the paucity of research in food service or restaurant environmental sustainability, a qualitative methodology was used to fill that void on this contemporary subject matter.

Summary of the Findings

The summary of findings presents an overview of the results for the research questions. Direct quotes from participants are used. All other discussion is the researcher's summarization of the results.

Summary of Research Question 1

What environmentally sustainable processes have been added or modified? What was it like going through the process?

The study revealed five major environmental processes used in the restaurant operation: waste streams, local foods, compostable goods, utility and energy levels, and food production levels. Among these issues, local foods and waste stream particularly, composting, were the most widely cited.

Uniqueness of Process in Research Sites

Differences in size and customer base show uniquenesses in the processes where more local foods were used in the smaller site, while the larger one was able to introduce more processes due to its larger size.

Critical Incidents

Critical incidents of each process were also noted:

Waste streams encountered a fruit fly infestation

Local farmers were sometimes unreliable

Compostable to-go containers sometimes leaked

A chef was reduced to cursing to remind his staff to turn the lights off.

Food was often over prepared

Summary of Research Question 2

How does management affect environmentally sustainable restaurant initiatives within the restaurant? How do employees affect environmentally sustainable restaurant initiatives within restaurant?

After the processes were explained by the participants, Research Question 2 was used to answer what managerial roles and employee actions were utilized to affect environmental sustainability.

The study revealed four managerial roles within restaurant environmental sustainability: Training, purchasing, operations, and marketing. Training was frequently cited by the participants who stressed its need given that many may not understand the process or be new to the endeavor. Turnover was also an issue within the training context. The need for training by management focused around correct waste steam usage and knowledge of local food's origin and higher nutritional makeup. Along with these local foods, managers could improve their ecological footprint through continuous use and investigation of compostable materials to be purchased by the restaurant and by marketing their efforts more. Employees were able to further initiatives through peer policing of waste stream usage, peer training, and the communication of new ideas to management.

Summary of Research Question 3

What effect, either positively or negatively, do outside entities have on the additions or changes in the process?

Finally, the study found external entities that affected restaurant sustainability: customers, competition, government, and farmers and other vendors. While most of the participants agreed that *green* customers, either as individuals or groups, would drive the ecological demand, competition could hamper it if the offering were vastly cheaper. However, a community that contained many environmentally sustainable businesses was seen by some participants as helpful. Government was viewed skeptically. However, some participants did see a possible role for government through either incentive programs or education. Lastly, as stated in different parts of the results, the local farmer was often seen as unreliable,

challenged by seasonality, and lacking in infrastructure compared to the large food suppliers.

The results of this study depict the events, actions, opinions, and external influences concerning these *green* restaurant innovators within the structure of the theoretical framework, the diffusion of innovation. As discussed in Chapter 1, those who are the first to adopt a practice are seen as innovators. According to Rogers (2003), these innovators are small, and only make up 2.5% of those who adopt a practice. However, Rogers also states that they often have higher education, social status, and command larger operations. One can learn from these innovators. With environmental sustainability being a newer issue within the restaurant sector, their experiences both support and contribute to the literature and prove helpful to the industry. A further discussion follows.

Tying Conclusions to Key Literature

As reviewed in Chapter 2, current literature addressed some of the environmental sustainability issues found in this study. Additionally, this study revealed some factors not found in literature. This section discusses what study findings have been supported by key literature and what new contributions are made by the study to help understand factors in environmentally sustainable restaurants.

Support in Literature. This study found four themes supported in literature, food composting, the farmer/government relationship, signage used in information dissemination, and Lean manufacturing. First, the literature supports the notion that environmental sustainability in the food sector is an important issue. The

literature indicates that food waste can be harmful to the environment. Douglas (2010) points out that the 32 million tons of food scraps, which make up 13% of all trash, can rot and produce methane, a greenhouse gas, 21 times more potent than carbon dioxide. The US Environmental Protection Agency (EPA, 2000) itself set guidelines that composting should be considered for food waste before being sent to the landfill. In this study, all participants spoke of composting.

Of particular note, while in the literature, general composting was discussed, the participants in this study went much deeper and spoke of the various items, aside from food, that could and could not be composted. They then used such knowledge and desire in seeking out items (purchasing) to be used in the restaurant that could be composted after their use.

The second issue, that literature supports in environmental sustainability within restaurants, concerns farmers and their relationship, or lack thereof, with the government. Recalling from Chapter 2, that sustainable agriculture practices (SAP) exist and, that local organic foods are a key ingredient to restaurant environmental sustainability, education was found to be in short supply. Rodriguez, Molnar, Fazio, Sydnor, & Lowe, (2008, p. 67) found that farmers lacked the knowledge or education of such practices. This study supports the literature in that the local farmers often did not posses such knowledge on environmental sustainability. The famer/government relationship was also seen by Rodriguez et al (2008) where local municipalities favored incumbent, higher yield, traditional farms over smaller organic ones. As compared to the larger agribusiness sector that receives

government help in a variety of ways, this study supports the literature that this is not the case at the local organic level.

Third, Miller, (2010) detailed the many different signs that a university used throughout their campus covering different themes of environmental sustainability. The goal of the university was to educate the student and have signage near a contact point that could aid in the student making a better environmental decision. From examples of posters stating not to let the water run while brushing one's teeth in the bathroom to the use of colorful light switches with verbiage asking them to be turned off when students were exiting or when the lights were not in use, Miller detailed effective ecological signage. In this study signage was revealed through composting signs that were displayed in the kitchen near waste stream disposal. Of particular note, in this study actual items were stapled to the poster board of real life compostable examples as opposed to using just words.

Fourth, Bergmiller & McCright (2009) showed that Lean manufacturing processes led to green processes in the general manufacturing industry as a whole. Further, Engelund, Breum, and Friis (2008) provided a study that took Lean principles and showed that they could be applied to food service production as well. In this study, the proper management of food inventory levels was seen as an important component by some participants from both an efficiency and ecological perspective. Additionally, much like the participants in the Engelund et al. study who demonstrated usage of the Kaizen principle in which employees were encouraged to share ideas and provide input, some participants in this study also indicated the importance of the sharing of ideas for new green initiatives.

Contributions to Literature. This study provides insight into literature on identifying environmentally sustainable processes in action, effects by managers, and external influences.

Whereas newer organizations have recommended processes that a restaurant could undertake in furthering environmental sustainability, little has been presented on its relation to context. This study identified two key issues not found in the literature search: front versus back-of-house processes and a critical incident in composting.

The findings of the difference in the areas of the actual operations and how sustainable they were adds important information to the literature. Previously, researchers discussed differences in sustainability adaptation by different types of hospitality businesses (Tzschentke, Kirk, & Lynch, 2007). This study adds to the literature and provides examples of the adaptation by different areas *within* the restaurant itself. Restaurant workers often refer to themselves and each other according to where they work within the operation. You are either a front-of-the-house (dining room) person or a back-of-the-house (kitchen) person. Results of the study found that the majority of the back-of-the-house workers viewed themselves as more of a team than the front-of-the-house and were thereby more able to further environmentally sustainability initiatives though their deeper understanding of the local foods being purchased and prepared and by building sustainable actions into their daily job functions. The results showed that environmental sustainability was better understood and executed by back-of-the-house workers.

While the kitchen saw themselves as more sustainable than the front-of-the-house, this study also revealed that it was the front-of-the-house workers, food servers, who were the ones with the direct customer interaction and were more *able* to sell, or inform the guest of local food offerings and other sustainable initiatives. This was revealed by the majority of the front-of-the-house participants. Additionally, it was these customer-facing employees who also were responsible in receiving guest feedback and recommendations. Guest contact was cited by a majority of the front-of-house participants. While sales of local foods were a potential strength of the front-of-house processes, a majority of the front-of-the-house participants also revealed that due to higher turnover, contamination risk of the waste stream was higher involving dining room workers. With this understanding, the front-of-the-house processes have potential to do great good in moving local foods but also more damage, as compared to the kitchen, to the waste streams.

As mentioned earlier and seen in the theoretical framework, much can be learned from these innovators of environmental sustainability as they went through the various processes in the form of critical incidents. The critical incident here is in composting.

While literature does exist on the benefits of composting, none was found that studied critical incidents of its use. Given that only 3% of food waste is composted (Douglas, 2010), both research sites are clearly innovators.

Previously researchers discussed food disposal in terms of the point at which the discarded items ended up, such as the compost site versus the landfill (Baldwin

& Chung, 2007). In restaurants, waste stream management in the summer months can be difficult for a restaurant in the handling of its refuse at the site level. Bad odors, birds, and vermin are some examples of the challenges faced. The critical incident here, the fruit fly infestation, was so powerful that it was able to shut down both composting and recycling endeavors for over a month. Additionally, one chef stated that once they restarted their composting and recycling efforts, it was not back to the level of before. This study contributes to the literature in demonstrating some additional potential difficulties that could be encountered in environmental waste stream usage at the site level.

Switching to management, the contribution to the literature is seen in the updating of the purchasing function.

Recalling that Europe is often seen as having taken on environmental steps a decade earlier than the United States, Goodman (2000) provided an example of an environmentally sustainable hotel that combined their environment and purchasing functions into one. “Many environmental issues are easier to handle upstream than downstream. By adding environmental concerns into the selection of goods and services, many environmental problems can be eliminated before they come in-house” (Goodman, 2000, p. 208). While Goodman cited shampoo bottles and dishwashing liquid as examples where the hotel studied was able to work with their vendors to find more environmentally sustainable products, this study, with its restaurant focus, found that the same thought process could be applied to the restaurant sector and its purchase of organic food items. In this study the larger research site was able to work with an organic chicken farm that was cited by some

participants as having a steady reliable product. Even if it cost a little more, the chef saw value in a product that tasted good and was readily available.

Lastly in external entities, the contribution to literature was seen in government and farmers.

In Revell and Blackburn's (2005) study of sustainability within the UK construction and restaurant sector, the authors found that the restaurant industry had less dialogue with their government agencies than did the construction industry concerning sustainable matters. Their study revealed a lack of understanding of policies that were in place or being considered. In this study, some of the participants seemed to have a grasp of what policies were in place and what was coming down the road. What they wanted was for the government to go beyond the policy level and into an almost cooperation model, where incentives or grants could be awarded to restaurants that achieved certain environmental benchmarks. Importantly, some of the participants saw an even greater role for the government in educating the populace as a whole on green initiatives.

This study also adds to the literature on farming or agricultural operations. With much of the focus on local foods, waste disposal and bio-fuels, the business relationship of the local farmer with the restaurant industry was not found in a literature review. In furthering sustainable efforts within farming, this study found that it would be helpful if the local farmer had a better understanding of the restaurant business.

Recommendations

The primary purpose of this study was to investigate factors that contribute to environmentally sustainable practices in the restaurant industry. The secondary purpose of this study was to investigate how these practices can be implemented into the operation. Past research has shown recent issues involving environmental sustainability within different industries. This study attempted to investigate this theme within the restaurant industry. Based on the study results, the following recommendations for future research, management, and participants, are presented.

For Future Research

Today, numerous organizations and industries are implementing environmentally sustainable practices into their operation, including restaurants. While one can learn from past research on different industries, it can only go so far. As stated earlier, a Cornell round-table discussion found that a noticeable shift towards sustainability within the entire hospitality industry began in 2005, (Zhang, Jogleker, & Verma, 2010). The results of this study lay the groundwork for future study within the restaurant sector. Future research may continue to identify environmentally sustainable process, critical incidents of the processes, management and employee interactions, and the influences of external entities. This information will be beneficial not only in identifying and bettering sustainable practices within the restaurant, but also aid in understanding its delivery among the different restaurant segments presented in Chapter 1.

Future research may also further examine how management and employees respond to environmental sustainability within their operation. Therefore this study

can be extended to explore the application of environmental sustainability in the HRD/WLP and hospitality management fields, where the study of how a process not seen as a core business function (environmental sustainability) by some in the restaurant sector can be embedded into the business. Ultimately, I wish that future research on sustainability will further the results of this study by determining if there is a need to make environmental sustainability part of the job description and core function. The intention is not to force sustainability into the HRD/WLP and hospitality management fields. Instead, the intention is to investigate whether management and employees in restaurants need guidelines to abide by since, they are entering a whole new world with both the potential for success and failure.

With the heavy emphasis on health and safety regulations found in the restaurant industry, future research could focus on how they can be reconciled within waste stream and local food initiatives. With progressive restaurants buying more food locally and sending their waste though multiple waste streams, the points of vulnerability have increased. Future study could focus on both the additional vulnerable points and their reconciliation with modern codes and regulations.

Finally, future study can discuss the role of government. While it was noted in literature that a study of restaurateurs in the United Kingdom were unsure of what exactly the government did within environmental sustainability (Revell and Blackburn, 2007), future research could focus on the United States and on different governmental roles as well. Potential areas are environmental regulation, grant allocation, and education. Education in particular could involve many different

audiences. How different generations view sustainability and whether their contact with it differed in terms of their education and business understanding of what is available to them from their local governments are two examples of possible future research.

For Management

Recalling from Chapter 1 that a Global Reporting Initiative has been embraced by many organizations in reporting their environmental initiatives, Ricaurte states, "The GRI deals with the ‘What’ and ‘Why’ to the equation, but leaves the ‘How’ up to the organization and related standards or protocols” (2010, p. 1). The findings of this study provided certain examples of how environmentally sustainable initiatives within restaurants can be furthered by management. Among other issues, training was identified by a majority of the participants as critical. This study revealed that managers saw the value in early training in sustainable processes for the benefit of the restaurant and the environment. Such training included proper waste stream ecological handling, such as a trash or compost decisions. However, most participants stated that they believed that many employees lacked a thorough understanding of the entire composting initiative and were rather just told what to put where. One recommendation for management would be to provide a thorough description of the entire composting initiative during early on the job employee training. It is advisable that managers not only describe the initiative, but also its impact on both the restaurant and environment. Recalling that one participant described a problem with turnover and that a bare minimum of ecological training was needed, a core set of skills could be

incorporated into a checklist. *What*, *why* and *how* regarding waste stream usage could be provided. Common problems around contamination and critical incidents would also warrant coverage. In addition to waste streams, a general overview of sustainable food offerings and their origins (which farm) should also be part of the training due to the importance of customer interaction. Restaurant Management Systems could also be expanded to provide end-of-day reports on sustainable outputs including, but not limited to, energy consumption and waste stream counts, volume, or weight.

Training can also occur with vendors. Some management participants indicated that they believed their local farmer did not really have an understanding of the restaurant business. Delivery and consistency were seen as challenges. By taking time to train the local farmer on restaurant workings, the site would then have a vendor who better understood the operation. This new understanding possessed by the farmer could also be shared with other farmers, or related vendors in the community. In other words, if the farmer is given a better understanding on restaurant purchasing, preparation, and operations, delivery schedules and consistency could be improved.

While the farmer could better understand the restaurant, the reverse is true as well. Local restaurants could develop better cooperation with community-supported agricultural (CSA) outlets and add to their knowledge base. In adopting a better understanding of the entire operation and supply chain of the CSAs, the innovators of restaurant environmental sustainability could further add to their skills set and

transfer it to those in the later stages of adopting and infusing environmental sustainability into their operations.

Another recommendation for management would be to track food production levels more closely. Some of the participants stated that they often over prepared the number of food items because they had just finished their busy season, when in fact they were not as busy and overproduced. With food inventory perishable, this problem can be remedied by using an information reporting system that details past food production levels based on guest count.

Finally it is recommended that management investigate additional information systems that could be created within the local food purchasing function. Much like an organization that asks for proposals for an item they wish to purchase from a vendor, management could provide local food needs for certain future events on a web site. Local farmers would have access to the restaurant's upcoming needs and respond accordingly if they were able to meet that demand. If such a successful system for these special events were seen as successful, then management could consider widening the offering until a local communication system was in place for all meals.

For Employees

The results of this study also provide recommendations for practitioners or employees. With regard to environmental sustainability, it is recommended that employees embed what was given to them by management in early training into the operation through peer policing. As the study revealed, some participants saw the value in speaking up when their peers made incorrect ecological decisions. From

composting, to using less water, to understanding the higher nutritional levels in local foods, some participants spoke of the need to correct the old habits of their peers and move them to develop newer, more ecological ones. Given the newness of the environmental sustainability, gentle peer reminders could add to its successful implementation.

The Road Ahead

Given the obvious cost savings in energy, consumer demand for sustainable offerings (local food), and newer infrastructure such as compost facilities being built, environmental sustainability initiatives within the restaurant industry are starting to make sense to some, but not all, owners and operators. With many of the solutions happening locally, the extent to which initiatives are embraced or utilized differs from town to town and city to city. For the foreseeable future, this seems to be the case primarily because local foods and waste stream operate within that certain community. Restaurateurs who wish to learn from the innovators have a choice of either locating in an area that embraces sustainability and contains the needed infrastructure or effecting change in an area that does not. Wider impact can be accomplished through pressuring vendors to create more sustainable products, government incentives, and education. The combination of the many factors given by the innovators in this study show that while there is a lot to do, it can be done.

Lessons Learned

This study contains lessons learned that may be of benefit to future researchers who wish to conduct a similar study. This section discusses the methodology uses and personal insights.

The first lesson that I learned was the importance of getting senior level buy-in for the study. I met with management of both locations and explained the purpose of my study. Management was very receptive to the idea and recommended that I start with the chef from each location. After my initial meeting with each chef, front-of-the-house management was contacted on my behalf. Soon after and rather painlessly, due to management buy-in, I had my participants from both the front and back-of-the-house and from each location in order. Each participant was told by their superiors, in addition to myself, that they should feel free to speak freely and that their interviews would be kept confidential. Given that each research site seemed very interested in improving their ecological processes, they also saw value in it for them. This last piece proved helpful in the interviews and resulted in straight forward detailed answers, with both the bad and good represented. This last piece also proved helpful given the quick pace of restaurants. Restaurants are busy places and having a researcher tie up staff while they were on the clock could be troublesome. While some interviews took place during business hours after a meal rush, others took place on the participant's day off, a real commitment. This combination of management and employee buy-in proved extremely helpful.

The last piece of advice focuses on the interview process itself. Since the study focused on a contemporary subject matter, what was seen as common as opposed to new has not yet been defined. It proved helpful to me to dig a little deeper when participants gave general answers and moved on to the next topics. As one example, some saw such initiatives as recycling as common and understood

and quickly mentioned it. After some follow up questions, I gained a new list of a whole host of items outside of the traditional glass and plastic that proved insightful. More importantly, I also found a mindset in some participants to be constantly thinking of newer items to possibly recycle. If I had accepted the first comments, I would never have gotten this detail.

Summary

This study investigated factors that contribute to environmentally sustainable practices in the restaurant industry. The study also investigated how these practices can be implemented into the restaurant operation. Much can be learned from the innovators in this study. While their efforts were not perfect, and they faced many challenges, one can hope that others will indeed learn from them.

REFERENCES

Abbas, E.Z., Airey, D., Bowden, P., & Clarkeburn, H. (2008). Sustainability and ethics as decision-making paradigms in engineering curricula. *International Journal of Sustainability in Higher Education, 9,* 170-182.

Ackerman, F., Stanton, E.A., DeCanio, S.J., Goodstein, E., Howarth, R.B., Norgaard, C.S., & Sheeran, K.A.(2009). The economics of 350: The benefits and costs of climate stabilization. *Economics for Equity and Environment*, October, 2009.

Aras, G., & Crowther, D. (2008). Governance and sustainability: An investigation into the relationship between corporate governance and corporate sustainability. *Management Decision,* 46*(3),* 433-448.

Baertlein, L.(2011, January 19). U.S. restaurants to benefit as grocery prices rise. *Reuters*. Retrieved January 20, 2011, from http://www.reuters.com

Baldwin, S., & Chung, K. (2007). Sustainable disposal of edible food byproducts at university research farms. *International Journal of Sustainability in Higher Education.* 8*(1),* 69-85.

Barber, N., Taylor, C., & Strick, S. (2009). Wine consumers' environmental knowledge and attitudes: Influences on willingness to purchase. *International journal of Wine Research,1*, 59-72.

Bazeley, P. (2007). *Qualitative data analysis with Nvivo*. Los Angeles: Sage.

Beckley, J., Foley, M., Topp, J, Huang, J., & Prinyawiwatkul (Eds.) (2007).*Accelerating new food product design and development*. Ames Iowa: Blackwell Publishing.

Bennis, W.G., (1969). *Organization development: Its nature, origin, and prospects*. Reading Massachusetts: Addison- Wesley.

Bergmiller, G., & McCright, P. (2009). Lean manufacturers' transcendence to green manufacturing. Proceedings of the 2009 Industrial Engineering Research Conference.

Bierderman, P.S. (2008). *Travel and tourism: An industry primer*. Upper Saddle River, NJ: Pearson.

Breidenich, C., Magraw, D., Rowley, D., & Rubin, J.W. (1998). The Kyoto protocol to the United Nations framework convention on climate change. *The American Journal of International Law, 92 (2),* 315-331.

Bryant, A., & Charmaz, K. (Eds.)(2007). *The sage handbook of grounded theory*. Los Angeles: Sage.

Burke, W.W. (2011). *Organization change: Theory and practice* (3rd ed.). Los Angeles: Sage.

Boldrin, A., Andersen, J.K., Moller, J., Christensen, T.H., & Favino, E.(2009). Composting and compost utilization: Accounting of greenhouse gases and global warming contributions. *Waste Management & Research, 27,* 800-812.

Brown, D.A. (2008, May 19). *The ethical duty to reduce greenhouse gas emissions in the face of scientific uncertainty*. Retrieved March 15, 2011, from http://climateethics.org/?p=35.

Brown, N.J. (1981). Biological diversity: the global challenge. *Proceedings of the US Strategic Conference on Biological Diversity*, (Department of State publication No. 9263, pp. 22-27) Washington, DC: US Department of State.

Budiansky, S. (2010, August 19). Math lessons for locavores. *The New York Times*. Retrieved August 23, 2010, from http://www.nytimes.com.

Carraher, S.M., Buckley, M.R., & Carraher, C.E. (2008). Research challenges in sustainable strategic management: Change and sustainability. *International Journal of Sustainable Strategic management, 1*, 2-15.

Charmaz, K. (2008). *Constructing grounded theory*. Los Angeles: Sage.

Chou, C.J., Chen, K.S., & Wang, Y.Y. (2011). Green practices in the restaurant industry from an innovation adoption perspective: evidence from Taiwan. *International Journal of Hospitality Management*, 1-9.

Center for Integrative Environmental Research. (2008). *Economic impact of climate change on Pennsylvania*. Retrieved May 9, 2012, from www.cier.umd.edu/climateadaptation

Cresswell, J.W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). London: Sage.

Dahle, M., & Neumayer, E. (2001). Overcoming barriers to campus greening: A survey among higher educational institutions in London, UK. *International Journal of Sustainability in Higher Education, 2*, 139-160.

Deen, S. (2002, May 11). *Don't be fooled: America's ten worst greenwashers*. Retrieved May 11, 2011, from http://www.greenwashing.net.

Doherty, K. (2010, June). Carbon calculations: Food companies that measure their carbon footprint reduce environmental impact-and save time and money. *Food Logistics*, 25-30.

Douglas, D.D. (2010, October 25). In discarding food scraps, more restaurants are going green by composting. Washington Post. Retrieved November, 25, 2010, from http://www.washingtonpost.com

Engelund, E., Breum, G., & Friis, A. (2008). Optimization of large-scale food production using Lean manufacturing principles. *Journal of foodservice, 20,* 4-14.

Environmental Protection Agency. (2009). *Inventory of U.S. greenhouse gas emissions and sinks.* Retrieved March 15, 2011 from http://www.epa.gov/climatechange/emissions/downloads09/inventoryUSGhG1990-2007.pdf

Environmental Protection Agency. (2004). Compliance recertification application. Retrieved May 7, 2012 from http://www.epa.gov/radiation/docs/wipp/recertification/glossary_030304.pdf

Environment Protection Agency. (2000). *Value of recovered organic materials, solid waste and emergency response*. Retrieved March 15, 2011 from www.epa.gov/region09/waste/solid/compost.pdf

Esty, D., & Winston, A. (2009). *Green to gold: How smart companies use environmental strategy to innovate, create value, and build competitive advantage.* Hoboken New Jersey: Wiley.

Evans, R.L., & Blaszcyk, J. (1997). A comparative study of the performance and exhaust emissions of a spark ignition engine fuelled by natural gas and gasoline. *Journal of Automobile Engineering. 211*, 39-47.

Farley, J.W. (2008). The scientific case for modern anthropogenic global warming. *Monthly Review.* 60*(3),* 68-90.

Fleming, J. (2009). Going green while saving money. *American Water Works Association Journal,1(12),* 36-42.

Fortune, M.A., (2007) Global warming: Myth or reality? *Bulletin of the American Meteorological Society.* 88*(1),* 89-93.

Freidman, T.L. (2005). *The world is flat*. New York: Farrar, Straus, and Giroux.

Frisque, D.A., Lin, H., & Kolb, J.A. (2004). Preparing professionals to face ethical challenges in today's workplace : Review of the literature, implications for PI, and a proposed research agenda. *Performance Improvement Quarterly*, 17*(2),* 28-45.

Gagne, R.M. (1968). Contributions of learning to human development. *Psychological Review,* 75*(3*), 177-191.

Gardner, G.T., & Stern, P.C.(2008). The short list, the most effective actions U.S.. households can take to curb climate change. *Environment,* 50*(5),*12-25.

Garlough, R. (2011). *Modern food service purchasing*. Clifton Park, NY. Delmar.

Gremler, D.D. (2004). The critical incident technique in service research. *Journal of Service Research*, 7(*1*), 65-89.

Grove, R. (2002). Climate fears, colonialism and the history of environmentalism. *Harvard International Review,* 23(*4*), 50-55.

Gupta, K. (2007). *A practical guide to needs assessment*. San Francisco: Wiley.

Han, S.K.& Shin, H.S.(2004). Performance of an Innovative two-stage process converting food waste to hydrogen and methane. *Journal of Air & Waste Management Association, 54*, 242-249.

Hassol, S.& Udall, R.(2003). A change of climate. *Issues in Science and Technology,* 19*(3),* 39-46.

Heller, M.C.& Keoleian, G.A.(2003). Assessing the sustainability of the US food system: a life cycle perspective. *Agriculture Systems, 76,* 1007-1041.

Herriott, R.E.& Firestone, W.A.(1983). Multisite qualitative policy research: Optimizing description and generalizability. *Education researcher*, 12*(2),*14-19.

Hines, J.M.,Hungerford, H.R., & Tomera, A.N. (1986). Analysis and synthesis of research on responsible environmental behavior: a meta analysis. *The Journal of Environmental Education*. 18*(2),* 1-8.

Hogenkamp, J., Erisman, J.W., Mennen, M., Kemkers, E., van Pul, A., Draaijers, G., Duyzer, J., & Wyers, P.(1995). Dry deposit monitoring of SO2, NH3 and NO2 over a coniverous forest. *Studies in Enviromental Science, 64,* 457-468.

Hopkins, M.S.(2009). What the green consumer wants. *MIT Sloan Management Review,* 50*(4),* 86-90.

Humes, E. (2011). *Force of nature: The unlikely story of Wal-Mart's green revolution.* New York: Harper Collins.

Iles, A. (2007). Seeing sustainability in business operations: US and British food retailer experiments with accountability. *Business Strategy and the Environment, 16,* 290-301.

International Government Panel on Climate Change. (2009). *From energy crisis to environment crisis, the 1970s and 1980s*. Retrieved March 15, 2011 from http://www.ipcc.ch/pdf/glossary/ipec-glossary.pdf.

International Organization for Standardization (1997). Environmental management: Life cycle assessment principles and framework. The International Organization for Standardization, (Geneva, ISO 14040, 14041).

Inwood, S.M., Sharp, J.S., Moore, R.H., & Stinner, D.H. (2009). Restaurants, chefs and local foods: Insights drawn from applications of a diffusion of innovation framework. *Agriculture Human Values, 26*, 177-191.

James, M.R. (2009). *Going green: A comparative case study of how three higher education institutions achieved progressive measures of environmental sustainability*. Unpublished doctoral dissertation, University of South Dakota.

Jones, T.W. (2004). *Using contemporary archaeology and applied anthropology to understand food loss in the American food system*. University of Arizona, Bureau of Applied Research in Anthropology.

Jones, T.W. (2005, December). Analyzing retail food loss. *BioCycle*, 40-43.

Khosro, S.J., & Acikdilli, G. (2009). Marketing communications and corporate social responsibility (csr): Marriage of convenience or shotgun wedding. *Journal of Business Ethics. 88*, 103-113.

Kidwell, R.E. (2009). New Belgium Brewery: Sustaining earnings, employees, environment, and beer culture. *Journal of Applied Management and Entrepreneurship, 14*, 126-138.

Kourous, G. (2005).*Incentives to curb deforestation needed to counter climate change.* Retrieved May 12, 2011 from http;www.fao.org/newsroom/en/news/2005/1000176/index.html.

Kotter, J.P. (1995). Leading change: why transformation efforts fail. *Harvard Business Review, April*, 59-67.

Kyoto Protocol. (2009). *A survey of organization, providers, and research involved in the effort to understand and deal with climate change*. Retrieved from http://www.kyotoprotocol.com/

Linnenluecke, M.K., Russell, S.V., & Griffiths, A. (2009). Subcultures and sustainable practices: The impact on understanding corporate sustainability. *Business Strategy and the Environment, 18,* 432-452.

Logan, C.A., Alter, S.E., Haupt, A.J., Tomalty, K., & Palumbi, S.R. (2008). An impediment to consumer choice: Overfished species are sold as Pacific red snapper. *Biological Conservation. 141*,1591-1599.

Lozano-Garcia, F.J., Gandara, G., Perrni, O., Manzano, M., Hernandez, D.E., & Huisingh, D.(2008). Capacity building: A course on sustainable development to educate the educators. International *Journal of Sustainability in Higher Education*, 9*(3)*, 257-281.

MacCracken, M.C.(2009). The increasing pace of climate change. *Strategic Planning for Energy and the Environment,* 28*(3)*, 8-25.

Mels, R.W., & Timmerman, M. (2009). Sustainable intensive livestock production demands manure and exhaust air treatment technologies. *Bioresource Technology, 100*, 5506-5511.

Merriam, S.B. (2009). *Qualitative research: A guide to design and implementation* (Rev. ed.). San Francisco: Jossey-Bass.

Miller, G., Pawloski, J., Standridge, C. (2010). A case study of lean, sustainable manufacturing. *Journal of Industrial Engineering and Management.* 3*(1),* 11-32.

Miller, L,L. (2010). *Measuring the efficacy of an energy and environmental awareness campaign to effectively reduce water consumption.* Unpublished doctoral dissertation, The Pennsylvania State University.

Murray, P.E. & Murray, S.A. (2007). Promoting sustainability values within career - oriented degree programs. *International Journal of Sustainability in Higher Education, 8(3),* 285-300.

National Restaurant Association. (2011, February 1). *NRA forecasts return to industry sales growth*. Retrieved February 2, 2011, from http://nrn.comarticle/nra-forecasts-return-industry-sales-growth

Patton, M.Q. (199). *Qualitative evaluation and research methods* (2nd ed.). Thousand Oaks, CA: Sage.

Pawlik, K, D., Capehart, L.C., & Capehart, B.L. (2001). Analyzing facility energy use: a balancing act. *Strategic Planning for Energy and the Environment, 21*(3), 58-80.

Pearce, J.M., & Miller, L.L. (2006). Energy service companies as a component of a comprehensive university sustainability strategy. *International Journal of Sustainability in Higher Education, 7*(1), 16-33.

Phillips, P.P., & Phillips, J.J. (2011). *The green scorecard. Measuring the return on investment in sustainability initiatives*. Boston: Nicholas Brealey.

Retail Systems Research LLC.(2010). *The better run restaurant: environmental sustainability in restaurant retail 2010.* Miami, FL: Rosenblum, P. & Rowen, S.

Revel, A.& Blackburn, R. (2007). The business case for sustainability? An examination of small firms in the UK's construction and restaurant sector. *Business Strategy and the Environment, 16*, 404-420.

Ricaurte, E. (2010, November 11). *The standardization of sustainability*. Retrieved December 16, 2010, from http://www.hospitality.net.org/news/154000320/4049053.html.

Richards, L. (2005). *Handling qualitative data*. London:Sage.

Rimanoczy, I.B. (2010). *Business leaders committing to and fostering sustainability initiatives. Unpublished doctoral dissertation*. Columbia University.

Robbins, S.P. & Judge, T.A. (2007). *Organizational behavior* (12th ed.). Upper Saddle River, NJ: Prentice Hall.

Rodriguez, J.M., Molnar, J.J., Fazio, R.A., Sydnor, E., & Lowe, M.J. (2008). Barriers to adoption of sustainable agriculture practices: change agent perspectives. *Renewable Agriculture and Food System*, 24*(1)*, 60-91.

Rogers, E.M. (1995). *Diffusion of Innovations* (4th ed.). New York: Free Press.

Rogers, E.M. (2003). *Diffusion of Innovations* (5th ed.). New York: Free Press.

Ross, M. (2006). *How do communities change their culture towards more sustainable patterns of living, working, and learning?* Retrieved May 24, 2011 from Okanagan University of British Columbia web site: http://hdl.handle.net/2429/22666.

Rothwell, W.J. & Lindholm, J.E. (1999). Competency identification, modeling and assessment in the USA. *International Journal of Training and Development*, 3*(2)*, 90-105.

Rothwell, W.J. & Sullivan, R. (2005). *Practicing organization development: A guide for consultants* (2nd ed.). San Francisco: Pfeiffer.

Rynk, R. (Ed.) (1992). *On farm composting handbook.* Ithica, NY: National Resource, Agriculture, and Engineering Service.

Schmidt, A. (1996). *Chef's book of formulas, yields, and sizes.* (2nd ed.). New York: Van Nostrand Reinhold.

Seidman, I. (2006). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (3rd ed.). New York: Teachers College Press.

Sherman, S. (2004, February). Increasing edible food recovery. *Biocycle,* 33-37.

Shin, H.S. & Youn, J.H., (2005). Conversion of food waste into r by thermophilic acidogenesis. *Biodegradation, 16,* 33-44.

Sibbel, A. (2007). Pathways towards sustainability through higher education. *International Journal of Sustainability in Higher Education,10*(1), 68-82.

Sloan, P., Legrand, W. & Chen, J. (2009). *Sustainability in the hospitality industry: Principles of sustainable operations*. Amsterdam: Butterworth-Heinemann.

Smeets, M.W., & Faaij, A.P. (2007). Bio-energy potentials from forestry in 2050: An assessment of the drivers that determine the potentials. *Climate Change, 81,* 353-390.

Smerecnik, K.R. & Andersen, P.A. (2011). The diffusion of environmental sustainability innovations in North American hotels and ski resorts. *Journal of Sustainable Tourism.* 19*(2),* 171-196.

Stabel, W.R., (2008). Global climate change in the wider context of sustainability. *The Geneva Papers, 33,* 507-529.

Stake, R.E. (1995). *The art of case study research.* Thousand Oaks, CA: Sage Publications, Inc.

Steingress, F. M., & Frost, H. J. (1996). *Stationary Engineering*. (2nd Ed.). Homewood, IL: American Technical.

Sustainable Restaurant Association. (2011). *Our audit management survey asks things like...*Retrieved January 15, 2011, from http://www.thersa.org/index.php?option=com_content&view=article&id=172Itemid=136

Thomas Food Industry Register (1998). *Food for thought, celebrating 100 years in the food industry*. Thomson publishing Inc. New York.

Thout, L., Vaugois, N., & Maher, P. (2010). Fostering innovation in sustainable tourism. *Journal of Rural and Community Development*, 5, 76-89.

Tzchentke, N.A., Kirk, D., & Lynch, P.A. (2008). Going Green: Decisional factors in small hospitality operations. *International Journal of Hospitality Marketing, 27*, 126-133.

Van Manen, M. (1990). *Researching the lived experience*. Albany, New York: State University of New York.

Wolcott, H.F. (1999). *Ethnography: A way of seeing*. Lanham, MD: Altamira**.**

Wolf, J.A. (2011). Constructing rapid transformation: sustaining high performance and a new view of organization change. *International Journal of Training and Development.* 15*(1),* 20-38.

Wright, P.M.& McMahan, G.C. (1992). Theoretical perspectives for strategic human resource management. *Journal of Management*, 18*(2),* 295-320.

Yin, R.K. (2009). *Case study research: Design and methods* (4th ed.). Los Angeles: Sage.

Yin, R.K. (2003). *Applications of case study research* (2nd ed.). Los Angeles: Sage.

Zhang, J.J., Joglekar, N., & Verma, R. (2010). Developing measures for environmental sustainability in hotels. *The Center for Hospitality Research,* 10(8), 4-20.

APPENDIX A

Informed Consent Form

Informed Consent Form for Social Science Research
The Pennsylvania State University

ORP OFFICE USE ONLY

DO NOT REMOVE OR MODIFY

IRB# Doc. # 37828

The Pennsylvania State University

Date: October 28, 2011

From: Jodi L. Mathieu, Research Compliance Coordinator

To: Peter D. Nyheim

Subject: Research Proposal - Modification **(IRB #37828)**

Approval Expiration Date: September 19, 2012

(Note: This date reflects the anniversary date of the actual submission approval date.)

"Factors that contribute to sustainable practices in the US restaurant industry."

The revision(s) to the above-referenced study has been reviewed and approved by the Institutional Review Board (IRB). You may proceed with your study. Please continue to notify the IRB of any further changes to your study.

COMMENT: Approval of the modification submitted on October 14, 2011 has been granted for the following: (1) an increase in participant numbers; (2) additional locations; (3) revisions to recruitment documents.

On behalf of the IRB and the University, thank you for your efforts to conduct research in compliance with the federal regulations that have been established for the protection of human participants.

JLM/jlm

cc: Judith A. Kolb

Purpose of the Study: The primary purpose of this study is to investigate factors that contribute to sustainable practices in the US restaurant industry. The secondary purpose of this study is to investigate how these practices can be implemented into the operation.

1. **Procedures to be followed:** You will be asked to answer a series of questions during one 60 minute interview. Audio recordings will be made for the purpose of data analysis. You should not discuss names of persons or companies. If names are inadvertently given, they shall immediately be erased.

   Depending on the interview data, you may be contacted to verify the researcher's analysis of the data which may take another 60 minutes.

2. **Discomforts and Risks:** There are no risks in participating in this research beyond those experienced in everyday life. Some of the questions are personal and might cause discomfort.

3. **Benefits:** You will have full access to any data and reports resulting from this study. This research will provide insight into how different entities involved in restaurant operations can be more sustainable. This research will add to the literature in the study of sustainability in the restaurant sector and provide a foundation for future discovery of sustainable restaurant practices.

4. **Duration:** It will take about 3 hours to participate in the interview and one hour to verify their accuracy.

5. **Statement of Confidentiality:** Your participation in this research is confidential. Other than myself, only my dissertation advisor, Dr. Judith Kolb will have access to the interview data. Any references to the interview in the report will replace names with a participant number or pseudonym to protect confidentiality. The data will be stored and secured at my office in a locked file. The interview data will be destroyed when my dissertation is complete, no later than October, 2012. The Pennsylvania State University's Office for Research Protections, the Institutional Review Board and the Office for Human Research Protections in the Department of Health and Human Services may review records related to this research study. In the event of a publication or presentation resulting from the research, no personally identifiable information will be shared.

6. **Right to Ask Questions:** Please contact Peter Nyheim at (814) 865-9012 with questions, complaints or concerns about this research. You can also call this number if you feel this study has harmed you. If you have any questions, concerns, problems about your rights as a research participant or would like to offer input, please contact The Pennsylvania State University's Office for Research Protections (ORP) at (814) 865-1775. The ORP cannot answer questions about research procedures. Questions about research procedures can be answered by the research team.

7. **Compensation:** No compensation will be given, however you will be given full access to any research reports resulting from this study.

8. **Voluntary Participation:** Your decision to be in this research is voluntary. You can stop at any time. You do not have to answer any questions you do not want to answer. Refusal to take part in or withdrawing from this study will involve no penalty or loss of benefits you would receive otherwise.

You must be 18 years of age or older to take part in this research study. If you agree to take part in this research study and the information outlined above, please sign your name and indicate the date below.

You will be given a copy of this consent form for your records.

_____ _____

Participant Signature Date

_____ _____

Person Obtaining Consent Date

APPENDIX B

Interview Guide*

Interview Questions

1. Please tell me about your job in or in relation to the restaurant.

a. What are your major responsibilities? Can you walk me through a common daily routine?

2. What is the restaurant doing to be more sustainable?

3. What brought about these changes?

4. Can you provide an example of a sustainable restaurant initiative that was controversial and/or did not go well?

5. What emotions were seen during the process?

6. Can you provide an example of a sustainability restaurant initiative that was not controversial and/or went well?

7. What effect (did) do the changes have both internally and externally?

8. How can sustainability be encouraged in the restaurant?

9. Who is responsible for sustainability in the restaurant and how do they affect successful or unsuccessful implementation?

10. How does their role affect, or impact, the implementation of the initiative?

11. What training is necessary? How should this training be done? Who should lead it?

12. Can you provide an example of a sustainability initiative or best practice and walk me through the training process that was utilized to achieve the desired outcome?

13. What could stop or harm current sustainability initiatives?

14. How does the outside world help sustainability in restaurants?

15. How does the outside world hurt sustainability in restaurants?

16. Would sustainability be furthered better by competition or governmental regulation?

17. What piece of advice would you give a restaurateur who is about to embark on their sustainability efforts?

*While these questions provide the structure to the interview, other questions may arise in this exploratory study.

APPENDIX C

Coding to Theme Sample

Phase 1 – Open Coding and Transcript example

(R = the researcher, Employee 1, ABC = Participant 1 from site ABC)

Process added-compost Process added-recycling	**Employee 1, ABC:** I know that some time ago, the operation really started pushing a recycling and composting initiative. Very, very important that anything that is compostable, including wood and cardboard, any biomaterial that can break down is to be separated from trash like plastic and metals that will not break down – will not biodegrade. Really keep those separate; the whole idea being that we produce so much trash at both hotels, in the restaurant, and in the bar, the more we can keep separated, and really turn that compost into good compost, we reduce our, I forget the exact number, but it's tons of trash that it will reduce.

Phase 2 – Axial Coding example (Waste streams)

(Employee 1, ABC = Participant 1 from site ABC)
(Employee 2, XYZ = Participant 2 from site XYZ)

Q1: Environmentally Sustainable Process

Process added-compost Process added-recycling	**Employee 1, ABC:** Very, very important that anything that is compostable, including wood and cardboard, any biomaterial that can break down is to be separated from trash like plastic and metals that will not break down – will not biodegrade. Really keep those separate; the whole idea being that we produce so much trash at both hotels, in the restaurant, and in the bar, the more we can keep separated, and really turn that compost into good compost, we reduce our, I forget the exact number, but it's tons of trash that it will reduce.
Process added-compost Employee recommendations	**Employee 1, XYZ:** And I was here for a couple years and then I left, and back when I was here then, that's when they just first started a composting program. It was just getting off the ground back then. Now it's in full swing, and it's definitely a big part of what these guys do although I do have issues with how it's done.

Phase 3 – Theme example

Theme Q1: Waste stream management and improvement

Participants identified ecological processes currently in place. Additionally, participants offered suggestions on the need to find additional items that could be worked into the processes in both composting and recycling. Finally, they saw the need for vigilance around contamination issues.

Peter D. Nyheim

1120 Teaberry Lane #206
State College, Pa.
16803

W (814) 865-9012 e-mail pnyheim@gmail.com

Education

Ph.D., Workforce Education and Development, 2012

The Pennsylvania State University, State College, Pennsylvania
Green Restaurants

Masters in Business Administration, 2000

Drexel University, Philadelphia, Pennsylvania
Management Information Systems

Bachelor of Science, 1996

Drexel University, Philadelphia, Pennsylvania
Hotel and Restaurant Management

Bachelor of Arts, 1993

Lehigh University, Bethlehem, Pennsylvania
Government

Recent Experience

Senior Instructor of Technology, 2010 to present, The Pennsylvania State University, School of Hospitality Management

Instructor of Technology, 2005 to 2010, The Pennsylvania State University, School of Hospitality Management

Recent Presentations, Publications, and Memberships

- Speaker, Web 2.0 in Foodservice Management, 2009 FSTEC, Orlando Florida
- Panelist – Hospitality Technology Magazine Webinar, May 2008, "Customer Relationship Management"
- Microsoft Hospitality, Delivered Sales Force Training, Las Vegas, NV, November, 2007
- Lead author of Textbook "Technology Strategies for the Hospitality Industry" *Prentice Hall 2005. 2nd* edition, *2012.*
- Co-author, "Business Writing for Hospitality" *Prentice Hall, 2008*
- Contributing author, "Travel and Tourism" *Prentice Hall, 2008*
- Invited Speaker – Pennsylvania Restaurant Association, February 2006, April 2007, Pittsburg, Pa. "Current Trends in Restaurant Technology"
- Microsoft – Hospitality Technology Advisory Board
- Food Service Technology Conference – Advisory Board