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Case Studies of Wealth Creation and Rural-Urban Linkages

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Rural Futures Lab™

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Section 1
An Introduction to Wealth Creation and Rural-Urban Linkages

Brian Dabson

1.1 The Case Studies

The Case Studies

This collection of case studies of wealth creation and rural-urban linkages is part of a broader effort supported by the Ford Foundation, known as the *Wealth Creation in Rural Communities* initiative. The primary purpose of these case studies is to stimulate learning, discussion, and further inquiry about the application of the rural wealth creation framework. The cases were selected to illustrate different facets of this framework in action, and to further clarify the ways in which the framework could prove to be instrumental in achieving sustainable economic prosperity for rural people and places. The subjects of each of these cases represent decades of dedication and hard work by many people and organizations often in extremely challenging economic, social, and political contexts. These case studies are not evaluations or judgments of these efforts; on the contrary they are intended to provide foundations for rich debate on the future of rural regions and communities across the United States.

The choice of the four cases followed extensive web and literature searches, and engagement with multiple sector and organizational networks to identify potential candidates. The intention was that the cases would reflect diversity in geography, economic sector, scale, and motivation, so as to provide insights and perspectives on rural-urban linkages, the organization and development of value chains, and impacts in terms of wealth creation, as well possible transferable lessons and implications for policy. Site visits were complemented by phone interviews, documentation review, and data collection.

The cases are:

- *Transitioning to a Restoration Economy: A Case Study of the Oregon's Forestry Sector,* which focuses on the forestry sector in Eastern Oregon and on the value chain intermediary, Sustainable Northwest, based in Portland, Oregon.
- *Building a Regional Food System: A Case Study of Market Umbrella in the New Orleans Region*, which looks at the value chain intermediary, Market Umbrella, in New Orleans and on the particular challenges of promoting rural food systems in that region.
- *Plastics from Plants: A Case Study of NatureWorks, LLC, Blair, Nebraska*, describes a subsidiary of Cargill that converts corn into a value-added plastic resin as a replacement for petroleum-based plastics.
- *Wind Energy and Rural Development: A Case Study of West Texas*, which explores the burgeoning wind energy sector across rural West Texas.

This report begins with a discussion of the key concepts associated with wealth creation and rural-urban linkages, and then presents each of the cases in turn. The final section provides a commentary that uses the wealth creation framework to pose some questions that arise from the cases. The intention is to provoke discussions about both the cases themselves and what they say about the application of the wealth creation framework.

For readers not familiar with the language of wealth creation, some of the terms used in these case studies may be unfamiliar or at least used in unfamiliar ways. Table 1 offers some definitions as an initial guide.

Table 1: Definitions of Key Terms

Assets or Capitals	Forms of wealth that encompass the financial, natural, social, individual, built, intellectual, and political dimensions of a community or region
Asset Accumulation	Savings by individuals and households for key assets such as housing, education, and business start-up
Clusters	Geographic concentrations of interconnected companies and institutions that derive tangible benefits from proximity, common technologies, skills, etc., to enhance their competitiveness
Resilience	Ability of households, companies, communities and regions to anticipate problems, opportunities, and potentials, reduce vulnerabilities, respond to major disasters, and recover rapidly, better, safer, and fairer
Rural-Urban Linkages	Mutually beneficial relationships between rural and urban places and economies
Rural Wealth	The stock of enduring assets over which rural places have stewardship, control, or ownership
Rural Wealth Creation Value Chains	Value chains that intentionally protect and increase the stock of assets in rural areas, and which embody a set of values about which the consumer cares (such as renewable energy or locally-grown and/or organic food)
Sustainable Livelihoods	Capabilities, assets, and activities needed by households to make a living, ensure resilience, and build wealth
Value Chains	Sequence of activities and processes required to bring a product or service from conception to final use, where at each stage value is added as tools, labor, knowledge, skills are applied
Wealth Creation	Policies and practices that lead to the retention and creation of wealth

This introductory chapter provides some further descriptions of these key terms based upon a review of a broad body of academic and technical literature.

1.2 The Key Concepts

Sustainable Livelihoods

The Ford Foundation's *Wealth Creation in Rural Communities* initiative is itself part of the Foundation's *Expanding Livelihood Opportunities for Poor Households* program, in which livelihoods are defined as:

> …the ability to earn an income that enables the individual or the household to overcome vulnerability, maintain dignity, control their own lives, take risks to seize opportunities, and rebound from setbacks in everyday life by meeting needs and accruing assets. (Yellow Wood Associates, 2011, p.13)

The livelihoods approach is an analytical framework developed during the 1990s for incorporating concepts of assets, capabilities, and entitlements (Moser, 2008; Cameron, 2005). Carney defines livelihoods as:

> …the capabilities, assets (including both material and social resources) and activities required for a means of living. (Carney, 1998, p.1)

Carney then describes a livelihood as being *sustainable*:

> …when it can cope with and recover from stresses and shocks and maintain or enhance capabilities and assets both now and in the future, while not undermining the natural resource base. (Carney, 1998, p.1)

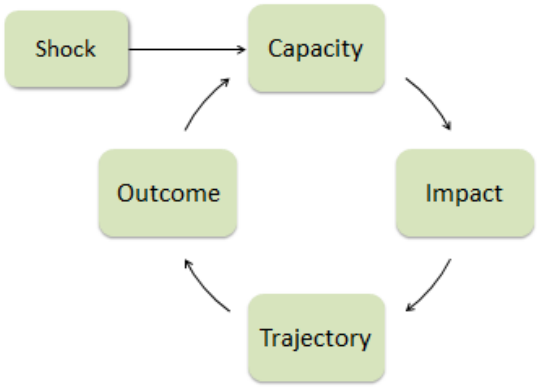
The strength of the sustainable livelihoods framework is in its people-centered, multi-sectoral, and inter-disciplinary approach to addressing poverty (Moser, 2008). As in many of the concepts discussed in this introduction, the literature draws heavily from research and experience in developing countries. The *Wealth Creation in Rural Communities* initiative is seeking to impact livelihoods in rural America through a focus on wealth creation, emphasizing the building and enhancing of assets of rural people and rural places (Yellow Wood Associates, 2011).

Resilience

There are important connections between sustainable livelihoods and wealth creation, and two other major areas of interest to researchers, policymakers and practitioners – resilience and asset accumulation strategies. The notion of resilience tracks closely Carney's definition of sustainable livelihoods:

> [A] resilient community is…one that anticipates problems, opportunities, and potentials for surprises; reduces vulnerabilities related to development paths, socioeconomic conditions, and sensitivities to possible threats; responds effectively, fairly, and legitimately in the event of an emergency; and recovers rapidly, better, safer, and fairer. (Wilbanks, 2008, p.10)

Figure 1: The Iterative Process of Resilience (Dabson, 2012)



Dabson (2012) provides a framework for rural and regional resilience that is summarized in Figure 1.

If a community's (or a household's) resources are able to withstand the impact of a *shock* – natural disaster, terrorism, disease, or economic crisis – without a discernible loss of function, then the community has demonstrated *resistance* to the particular type, scale, and intensity of the shock.

However, if the impact of the shock overcomes the community's *capacity* to resist, then there will be a state of temporary dysfunction as the community responds to the emergency. Capacity refers to the inherent vulnerability and the resources available to the community. In the context of this paper, these resources are in fact the community's assets. What happens next depends on the strength and depth of these assets.

One trajectory could be *recovery*, where the community is able to overcome the dysfunction and return to pre-event functioning without the need for substantial, change or adaptation. An alternative trajectory could be *resilience*, where the community moves to a "new normal", not necessarily better or worse than pre-event functioning, but certainly different. This is the most likely trajectory when the shock is at the level of 'disaster' or 'catastrophe'. Of course, the most desirable outcome is a significant improvement on pre-shock functioning in terms of increased community assets and reduced community vulnerability. A worst case trajectory is when the temporary dysfunction becomes persistent *or long-term dysfunction*, when the community is unable to return to an acceptable level of functioning (Dabson, 2012).

Moser (2008) makes the connection between vulnerability and assets in this way:

> The means of resistance are the assets and entitlements that individuals, households, and communities mobilize in facing hardship. Vulnerability is therefore closely linked to asset ownership. The more assets people have, the less vulnerable they are, and the greater the erosion of people's assets, the greater their vulnerability and associated insecurity. (p.81)

Assets Accumulation

Asset accumulation as a social policy idea is credited to Sherraden (1991). He argued that income only maintains consumption, whereas assets change the way people think and interact with the world. With assets, people can focus on the longer-term and pursue long-term goals. The two arguments underpinning this idea are that the poor can save and accumulate assets, and that assets have positive social, psychological, and civic effects separate from those associated with income. Asset accumulation for low-income households was operationalized through mechanisms such as the American Dream

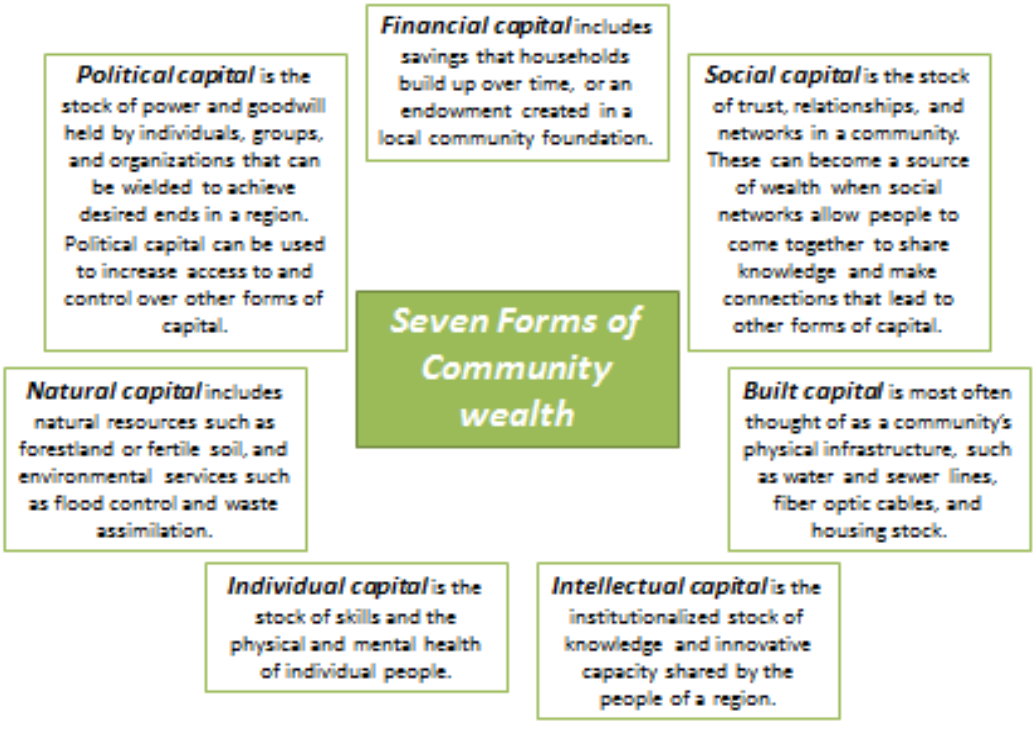
Individual Development Accounts (IDAs) demonstration, and the SEED (Saving for Education, Entrepreneurship, and Downpayment) initiative for children's saving accounts.

In a review of the impacts of these and other initiatives and programs, Sherraden (2008) suggests that there is reason to believe that the poor can save if they are embedded in institutional conditions that promote saving and to be cautiously optimistic about long-term saving outcomes and impacts of IDAs or similar saving strategies that include the poor. He refers to a number of operational and policy challenges that have arisen with the implementation of this approach, but he argues that asset-building will continue to play an expanding role in social policy in the United States and elsewhere.

Wealth Creation

The *Wealth Creation in Rural Communities* initiative expands the discussion about assets beyond individuals and households to communities and regions, and beyond financial assets to an array of assets (also known as capitals) that describe a more comprehensive view of wealth. These capitals are described in a "wealth matrix" that includes individual, social, intellectual, natural, built, financial, and political aspects (Yellow Wood Associates, 2011). This approach has many similarities to the Community Capitals Framework (Flora and Flora, 2004) and international work in the social policy field (Moser, 2008).

*Figure 2: Seven Forms of Community Wealth (*Adapted from Wealth Creation in Rural Communities (http://www.creatingruralwealth.org/wealth-creation-approach/multiple-forms-of-wealth/)



Using these multiple forms of capital as both a design and monitoring discipline, the wealth creation approach sets out:

> …to improve the livelihoods of rural people by creating wealth that is owned, controlled, and reinvested in rural places so that rural America is no longer left behind, but is a valued partner in resilient regions that make up the American landscape. (Yellow Wood Associates, 2011, p.5)

This mission statement brings together within a single framework the concepts of livelihoods, assets, and resilience. Through the application of the wealth creation matrix, the *Wealth Creation in Rural Communities* initiative is now putting the framework into operation in Central Appalachia, the Black Belt, and the Lower Rio Grande Valley.

One of the important breakthroughs of the initiative has been to recognize that there have to be connections to markets and market demand to ensure sustainable livelihoods. These connections are expressed as *value chains* in which producers, processors, buyers, and others work together to achieve economic, social, and environmental benefits.

Value Chains

A value chain is "…the full range of activities that are required to being a product or service from conception, through the intermediary phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use" (Kaplinsky and Morris, 2001, p.4). The term 'value chain' refers to the fact that value is added to preliminary products through combination with other resources – such as tools, labor, knowledge and skills – and other raw materials or preliminary products. As the product passes through the many stages of the chain, the value of the product increases (Herr and Muzira, 2009).

Figure 3: The Basic Components of the Value Chain (after Herr and Muzira, 2009, p.7)

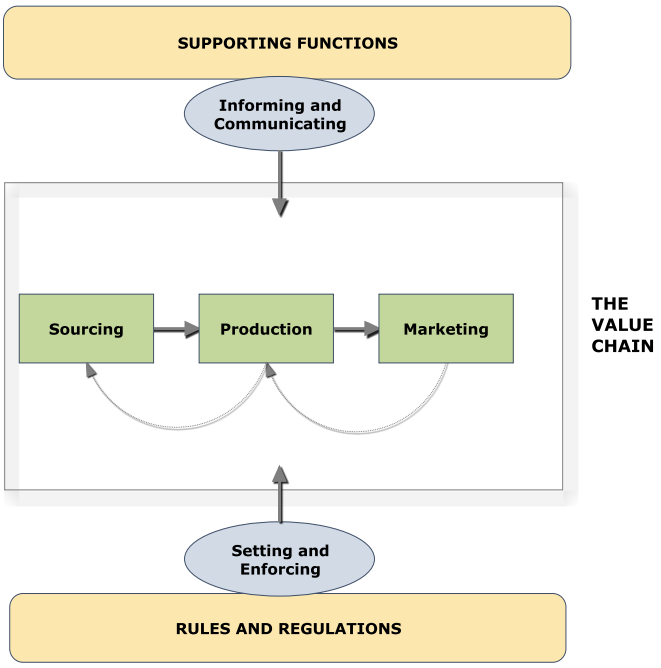


Figure 3 provides a simple illustration of the components of a value chain. At the core is the sequence of activities from raw materials to the customer, with the two main environmental influencers of supporting functions, which inform and communicate with the chain participants, and the rules, standards, and regulatory framework that governs the operations of the chain and its participants. Supporting functions might include mechanisms for coordination, information flows, research and development, financing, physical infrastructure, and skills and capacity.

There are significant benefits associated with mapping and analyzing value chains (Mitchell, Keane and Coles, 2009; Rich, Baker, Negassa and Ross, 2009). These include:

- Capturing the interaction of increasingly dynamic and complex markets and the inter-relationships between diverse actors at all stages of the chain.
- Identifying the power relationships between participants in a value chain, specifically who sets the "rules of the game" and how this constrains choices for the less powerful. In a developing country context, it is often clear that trade is not only about productivity and factor costs but also about brute economic power to extract value from the chain.
- Providing a way of engaging businesses in rural development through a focus on economic viability and commercial sustainability.
- Identifying critical issues and bottlenecks, and ways in which participants can derive more benefits from the chain, particularly important for the less powerful.
- Identifying the cost of and barriers to entry for aspiring or potential participants, as well as the nature and determinants of competitiveness in the marketplace.

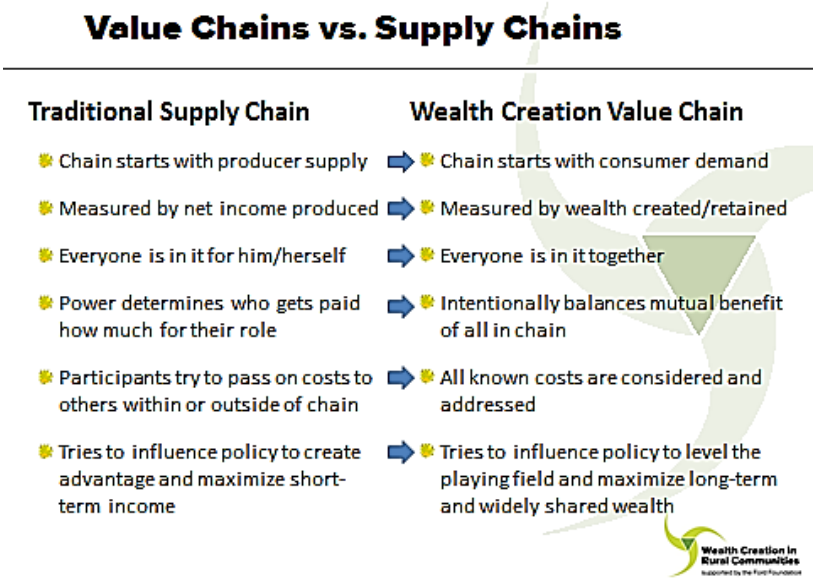
Efforts to enhance and develop value chains tend to focus on five drivers (Herr and Muzira, 2009):

- *Improving system efficiency*, by reducing costs, increasing efficiencies in each operation, and generally looking for the highest quality for the lowest price;
- *Improving product quality* so as to provide a competitive edge and ensure customer satisfaction;
- *Increasing product differentiation,* through a focus on innovation and learning, and embedding differentiation in the entire system not just the product;
- *Embracing social and environmental standards*, in response to changing customer preferences and social norms; and
- *Responding to the business environment*, both in terms of regulations and other governmental regulations, and the wider environment of macroeconomics, politics, government, and society.

Wealth Creation Value Chains

Within the context of the *Wealth Creation in Rural Communities* (WCRC) initiative, considerable effort has been expended in marrying value chain development with the wealth creation framework. Like the definition of "wealth", the WCRC initiative expands the meaning of "value" beyond monetary worth. According to the WCRC initiative, value chains are supply chains that reflect the values of the chain participants in the sustainable way that goods and services are produced, which encompasses the physical processes as well as the equitable relationships along the chain. A Wealth Creation value chain is a set of relationships and activities that lead to the production of something for market that embodies a set of values about which the demand side cares. Figure 4 shows the characteristics of a wealth creation value chain using traditional supply chains for comparison.

Figure 4: Wealth Creation Value Chain Characteristics (Yellow Wood Associates, 2011)



In the Central Appalachian region, the WCRC has focused on four such wealth creation value chains, summarized in Table 2.

Table 2: Value Chain Development in the Wealth Creation in Rural Communities Initiative (Yellow Wood Associates, 2011)

Value Chain	Intermediary	Development Purpose
Wholesale sustainable agriculture	Central Appalachian Network	Connecting small farmers to markets for healthy, sustainably produced, local foods
Green and energy efficient and affordable housing	Federation of Appalachian Housing Entrepreneurs (FAHE)	Providing safe, affordable housing that improves the quality of life for low-income homeowners using energy efficient and green building practices
Energy efficiency and renewable energy	Mountain Association for Community Economic Development (MACED)	Creating a market for energy efficiency and conservation and for renewable energy so as to reduce the energy cost burden on low-income families
Sustainable forestry wood products	Rural Action	Connecting local and regional forest owners with existing or potential markets for sustainable hardwood products

Each value chain intermediary has been required to measure the impact of its work in terms of building multiple forms of wealth.

Value Chains and Clusters

Value chains share many attributes with the concept of clusters, an economic analytical approach that has received considerable attention in the United States over the past 20 years. The premises underlying both approaches is that individual firms often face sector-level constraints that they cannot address alone, and that inter-firm cooperation is critical to increasing overall competitiveness (Chemonics, 2008). However, while the value chain approach focuses on the flow through a developmental process regardless of location of the participants, the cluster approach focuses on geographic concentrations of inter-connected companies and their interactions. Sometimes, this may encompass the whole value chain, sometimes different segments of the value chain, or in some circumstances involve firms that specialize in particular segments of multiple value chains (Chemonics, 2008; Humphrey and Schmitz, 2002; Roelandt and den Hertog, 1999).

Clusters are defined as:

> "…geographically close groups of interconnected companies and associated institutions in a particular field, linked by common technologies and skills…Clusters capture important linkages and spillovers of technology, skills, information, etc., that cut across firms and industries. Viewing a group of companies and institutions as a cluster highlights opportunities for coordination and mutual improvement." (Porter, 1996, pp. 199-205)

A Brookings paper calling for a more effective Federal approach to stimulating cluster competitiveness in regional economies across the United States (Mills, Reynolds and Reamer, 2008) expressed the view that regional economies are largely metropolitan in nature and that clusters are tools to leverage the economic strengths of cities, suburbs, and metros. This view is based on the perceived benefits of geographic proximity, where clusters are seem to promote knowledge sharing and innovation by providing "thick" networks of formal and informal relationships across organizations (Dabson, 2011).

The close association between clusters and metropolitan centers and regions presents significant challenges for those engaged in rural development policy and practice. If metropolitan-based clusters represent the new paradigm for national, state, and metropolitan economies (Muro and Katz, 2010, p.25), what is the future for rural economies? One way has been to conduct conventional cluster analyses for rural regions in an effort to identify where competitive advantage might be found (Porter et al., 2004; Monitor Group et al., 2006); an alternative has been to develop specific methodologies for discovering rural clusters (Rosenfeld, 2009).

There has, however, been one important study that provides a different way of thinking about clusters and value chains in a rural context and creates the bridge to the discussion on rural-urban linkages. Feser and Isserman (2009) analyzed the contribution that rural companies make to national value chains. They concluded that industry clusters are on a spatial continuum from those that are national in scope to those that are highly localized. Functional or economic interdependence is an important force underlying business and industrial competitiveness, but such interdependence may or may not be associated with a pattern of economic concentration.

Feser and Isserman continue:

> "…rural economies may depend on – as well as contribute to – the competitive success if clusters anchored elsewhere." Indeed, "the most important cluster for a given rural community's economic future

might be based in the rural locality itself, in a nearby urban area, or 1,000 miles away. A search for strictly locally based clusters, or even those nearby that spill into rural communities, may generate a misleading picture of the underlying economic base and prospective economic potential of a given place." (p.92).

Dabson (2011) made a similar point in a set of propositions underlying the concept of rural regional innovation. He identified three ways in which rural firms might relate to regional clusters:

- Rural businesses located within or close to metropolitan enters may be able to plug directly into clusters and value chains as suppliers and subcontractors.
- Those located further away will need to build upon the assets of their communities and regions, creating entrepreneurial opportunities that use telecommunications to link to customers. Although lacking the institutional thickness associated with metropolitan centers, community and virtual networks will perform cluster-type functions.
- For sectors that require space rather than proximity in which to operate, they will link into regional, national, and often global supply chains, and such will be part of non-proximate clusters. These include natural resource industries and large land users such as power plants, chemical facilities and defense establishments. (p.17)

Rural-Urban Linkages

The distinction between 'urban' and 'rural' places has been the subject of debate for a very long time. Although the idea of a dichotomy has long been disavowed by researchers, official definitions stubbornly classify that which is urban and designate that which is not urban as rural. One of the most coherent discussions on this issue in the United States was provided by Isserman (2005) who created a typology that better reflected the notion of a continuum from the most rural to the most urban places. The Economic Research Service (ERS) of the U.S. Department of Agriculture (USDA) has devised a number of additional methods to measure *degrees* of rurality. These include "rural-urban continuum" codes, "rural-urban commuting areas" and "county typology codes"[1] which attempt to capture some of the diversity and complexity of rural and urban settlement patterns and economic activities. Nevertheless, the designation of counties as either metropolitan or non-metropolitan as proxies for urban and rural still remain the basis for policy analysis and legislative intent.

In the international arena, the focus has thus been on the linkages between rural and urban places, and in particular on their complexity, scale, and dynamics (Tacoli, 2006; Tacoli, 1998; Von Braun, 2007; Satterthwaite, 2006; Douglass, 2006).

Tacoli (1998) describes four main types of interaction between rural and urban from her review of the literature:

- *Flows of people* – and their impacts on destination regions and communities are often politically contentious. The neo-classical perspective suggests that migration decisions are made by

[1] See USDA Economic Research Service at www.ers.usda.gov/Briefing/Rurality.
Rural-urban continuum codes distinguish metro counties by their population size and nonmetro counties by their degree of urbanization and adjacency to metro areas. *Rural-urban commuting areas* use Census Bureau urbanized areas and urban clusters combined with commuting information to create a typology of urban and rural census tracts. *County typology codes* attempt to recognize the heterogeneity of rural and urban counties according to their primary economic and social characteristics.

individuals seeing the comparative advantages of other places, in particular the possibility of improved economic opportunity. Structuralists, on the other hand, see migrants as victims forced by circumstances to move from unacceptable or hopeless situations. In any event, the main flows tend to be primarily from rural to urban, and particularly to the large metropolitan centers. In the U.S. context, the migration of Hispanic populations from Central America across the nation, and the population decline from the Great Plains provide examples of these flows.

- *Market interactions* – and infrastructure investments that encourage economic exchange between regions are a critical component of rural-urban linkage. This is where the discussion about value chains and clusters assumes great importance.
- *Flows of wastes* – from urban to rural areas are a worldwide phenomenon. Water pollution, loss and degradation of farmland through urban expansion and soil erosion, threats to forests, coastlines, and marine ecosystems from disposal of toxic wastes, air pollution and acid rain from urban industries, power generation and motor vehicles are among the among list of flows that position many rural areas as dumping grounds for urban wastes. Clearly these issues are not confined to developing countries and apply to varying degrees to rural American regions.
- *Sectoral interactions* – refer to urban functions that are carried out in rural areas, such as manufacturing, and rural functions carried out within urban areas such as urban farming. The challenges are at the interface between urban and rural, sometimes call the *peri-urban areas,* where urban and rural functions are spatially intermingled and where interactions are the most intense, both positive and negative.

Dabson (2007) framed these interactions as contributions that rural and metropolitan economies and regions make to each other's and the nation's prosperity.

The production of food and the extraction of energy, whether non-renewable or renewable, are the most obvious economic contributions that rural regions make. But there are many others. Some 30 million people live in rural communities where more than a quarter of workers commute into nearby metropolitan cores, and an increasing number of companies locate back-office functions in rural towns to access lower-cost workers or office space.

Rural communities are responsible for the stewardship of ecosystem services essential to human survival and well-being, such as clean air and water, flood and drought mitigation, pollution mitigation, pest control, seed dispersal, biodiversity, and climate stabilization. Mountains, wide-open spaces, pristine rivers, wildlife, and quiet special places, together with a rich cultural heritage, provide urban dwellers with a variety of experiences from the reflective to the extreme. Metropolitan congestion is given some relief by smaller towns and cities that offer affordability, space, and safety. And on the flip side, rural areas play a role in accommodating and managing metropolitan-generated wastes and "undesirable" activities such as power generation, sewage treatment, landfills, prisons, and military bases.

Metropolitan areas provide the concentrated markets for rural goods and services; they are the source of jobs and a magnet of economic opportunity for young people offering varied experiences, higher levels of skills, and higher incomes. They are also the location of a wide variety of specialized services, such as health care, high-end retail, entertainment and cultural activates, and legal and financial services.

A more recent review (Lichter & Brown, 2011) of the new "rural-urban interface" and the growing interpenetration of American urban and rural life points to the "enormous scale of rural-urban

interdependence and boundary crossing, shifting and blurring – along many dimensions of community life – over the past decades" (p.565) and two-way nature of these influences. Table 3 summarizes some of the dimensions of this interdependence.

Table 3: Dimensions of the Rural-Urban Interface (Lichter & Brown, 2011)

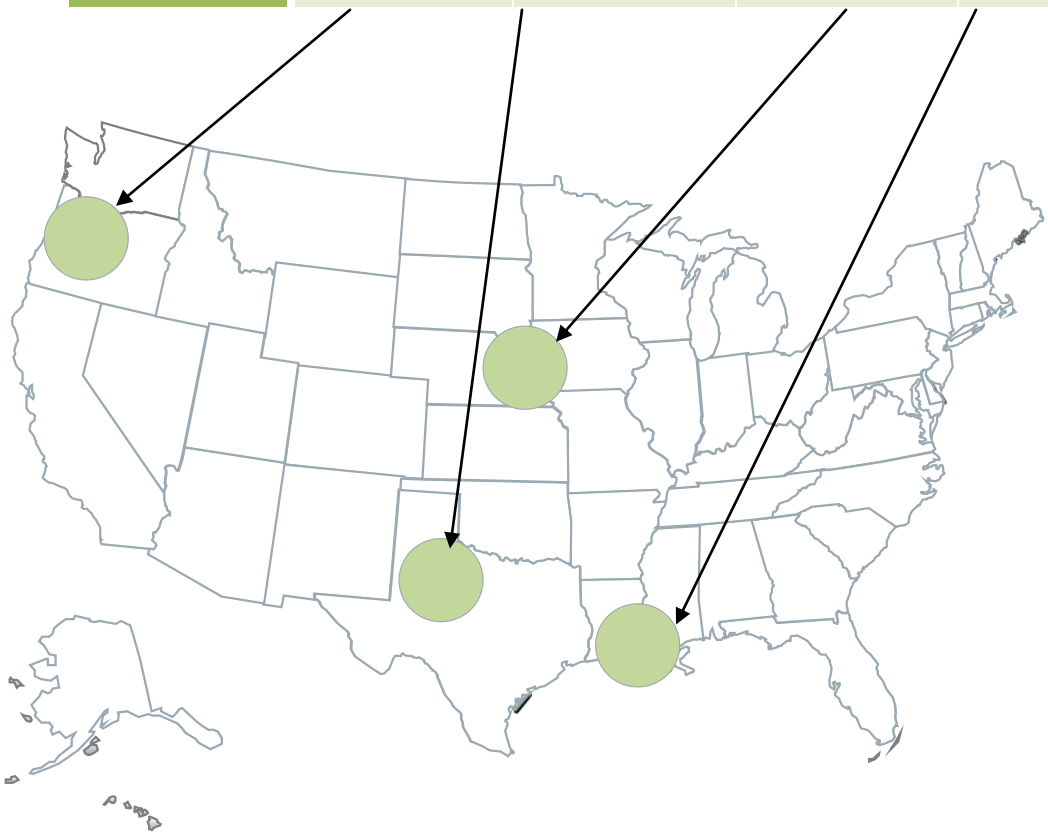
Rural America as…	
Cultural Deposit Box	Cultural differences between urban and rural have become less pronounced over time as urban influences permeate rural life, but rural values and lifestyles remain attractive to many urban dwellers.
Backwater	Associations with backwardness, isolation, conservatism, anti-government sentiments are still strong but it is becoming harder to maintain these stereotypes as urban influences increase.
Engine of Urbanization	The continuing migratory shifts between rural and urban in both directions has considerable impacts, both positive and negative on rural communities, often leading to conflicts over values and priorities, but blurring urban-rural distinctions.
Exurbia	Outward expansion of urban areas and increased commuting connect social and economic activities of rural and urban places and integrate rural, suburban and urban people, businesses and communities.
Place of Consumption	Ocean and mountain resorts, retirement communities, cultural and historic sites, national parks and recreation areas represent rural goods and services primarily consumed by urban and big-city populations. Second homes and in-migration are associated effects, all serving to blur boundaries.
New Immigrant Destination	The arrival of immigrants into previously homogenous rural communities creates both tensions and opportunities, and serves to open up rural areas to external influences.
Ghetto	Persistent poverty in rural counties historically associated in most cases with concentrations of racial and ethnic minority populations – Delta, southwest border, native American reservations. But changing patterns of poverty reflect urban-rural boundary crossing shifts and blurring.
Food Basket	Industrialization of agriculture has led to a rapid decline in the importance of farming as a source of employment. The need for off-farm incomes, often from urban-based employment, and increasing urban demand for fresh food that has given rise to intensive farming in areas close to urban centers. Both changes serve to speed rural-urban integration.
Repository of Natural Resources	Extraction and use of rural resources represent enduring relationships of dominance, dependency and unequal power within rural areas and between rural and urban areas. Conflicts between economic and environmental interests cross rural-urban and local-national boundaries.
Dumping Ground	Rural communities have become home to prisons, slaughterhouses, feedlots, landfills, and toxic waste sites giving rise to claims of environmental injustice – activities dumped on rural area by urban interests.

Wealth Creation, Value Chains, Rural-Urban Linkages and the Case Studies

The four case studies presented in the next four chapters illustrate different dimensions of wealth creation, value chains, and rural-urban linkages. Table 4 provides a preview of these dimensions.

Table 4: The Case Studies and Dimensions of Wealth Creation

Sector	Forestry Products	Alternative Energy	Bio-Manufacturing	Food Systems
State	Oregon	Texas	Nebraska	Louisiana
Wealth Creation	Shift from exploitative to restoration rural economy	Market driven with multi-level wealth implications	Market driven with multi-level wealth implications	Focus on social capital
Value Chains	Market development intermediary	Demand driven entrepreneurship	Corporate driven market development	Market development intermediary
Rural-Urban Linkages	Rural production, niche urban markets	Rural production, state/national urban markets	Rural/regional production, global markets	Rural production, urban public markets
Scale	State/multi-state	National	Global	Local/regional



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Section 2
Transitioning to a Restoration Economy

A Case Study of Oregon's Forestry Sector

Photo: USDA Forest Service

Brian Dabson

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Acknowledgments

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2.1 Introduction

There are four principles that underlay the wealth creation approach. "Respect people and their places. Help people collaborate and tap new markets based on shared values. Build many kinds of wealth so everyone benefits. Keep wealth local."[2] These principles are at the core of a major transformation that was set in motion over 20 years ago and is still playing out today in the forests of Oregon.

This is a story about a series of shifts:

- From an extractive to a more sustainable natural resource economy
- From bitter conflict to careful collaboration
- From external control to community-based partnerships
- From wealth depletion to wealth creation

The story is continuing and these shifts are only just beginning. The extractive economy is still in evidence as the privately-owned forests in western Oregon rapidly expand exports of unprocessed logs to Asia. As Governor Kitzhaber observed:

> This amounts to nothing more than exporting our natural capital and our jobs. We are at risk of becoming a timber colony for Asia; while undermining our mill infrastructure and their surrounding communities… (Kitzhaber, 2011)

There is still distrust and conflict in the forest communities, and legislative and legal battles continue over the appropriate balance between economic and ecological goals for publicly-owned forests. The Federal government still owns and controls 60 percent of Oregon's land base which fuels ongoing political and philosophical debates as to who should determine the future of the state's natural resources. At the same time, there are changes in the nature of private forest ownership which are pushing more investment and management decisions outside Oregon. And the idea of thinking about the nation's natural resources through the lenses of multiple forms of wealth is still in its infancy.

Nevertheless, there is much to celebrate in Oregon. This case study can only scrape the surface of what is an extremely complex and evolving chain of events and much has been left out. But there are signs of a developing restoration forest economy and its positive impacts along the forest products value chain; these impacts can be seen both in terms of wealth retention and creation and of forging linkages between rural and urban people and places. These developments do not just happen on their own. They require careful nurturing and intelligent intervention from a wide variety of people and organizations. The focus of this case study is on one such organization, Sustainable Northwest, which has played and continues to play the vital role of value chain intermediary.

This report describes the national context for forestry and the forest products sector and then the specific context of the Oregon forests, including the impact of a major swing in national policy towards the management of Federally-owned forest lands. There follows a discussion about the transition to a restoration economy and the role that Sustainable Northwest plays in that transition, together with a look at the research on rural-urban interdependence.

[2] See Wealth Creation in Rural Communities www.creatingruralwealth.org

2.2 The National Picture

This description of the national context is adapted from a report by the U.S. Forest Service (Smith, Miles, Perry & Pugh, 2009).

Main Characteristics of U.S. Forestlands

Forestlands extend over about one-third of the land mass of the United States, amounting to some 751 million acres – or equivalent to the area of the eight largest contiguous states. As shown in Figure 5, 68 percent of forestlands are classified as timber land – forests that are capable of producing 20 cubic feet per acre of industrial wood supply annually and not legally reserved from harvest. An additional 75 million acres (10 percent of total forestlands) are reserved for non-timber uses and are managed by public agencies or wilderness areas. The balance of 162 million acres are forests that are of low productivity but are of major importance for watershed protection, wildlife habitat, domestic livestock grazing, recreation, biodiversity maintenance and other uses. Most of this category is in the interior West and interior Alaska.

U.S. timberland contains approximately 920 billion cubic feet of growing stock, of which 57 percent are softwoods and 43 percent hardwoods. Softwoods are concentrated in the West, 43 percent of which are in the Pacific Northwest; hardwoods are predominant in the East. Douglas fir is the most abundant softwood; oak is the most abundant hardwood.

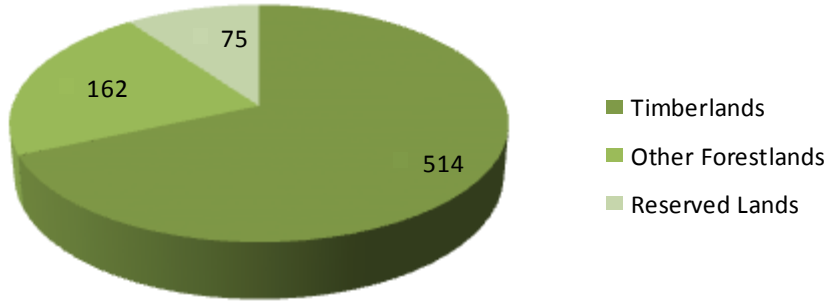


Figure. 5: U.S. Forestlands by main categories (million acres)

The Ownership and Management of U.S. Forestlands

About 44 percent (328 million acres) of forestlands are in public ownership (see Figure 6), three-quarters of which is controlled by the Federal government and about one-fifth by state agencies. The U.S. Forest Service has the largest share of publicly-owned forest lands extending over 147 million acres, or 20 percent of the total. There is much regional variation in ownership patterns, with the largest proportion of public lands at 67 percent in the Pacific Northwest region.

The 423 million acres in private ownership are in the hands of 11 million owners, 60 percent of whom own less than 10 acres. However, two-thirds of the forestland is owned by people or organizations with 10 acres or more. Those with holdings of 10,000 acres or more account for 22 percent of privately-owned forestlands. Family forests (owned by individuals, couples, estates, trusts) represent 92 percent of owners but only 35 percent (264 million acres) of forestlands.

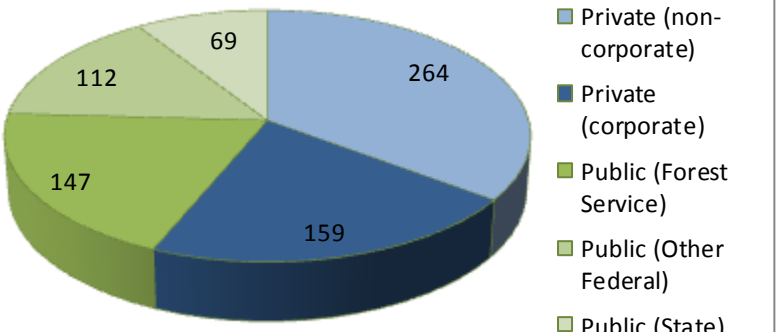


Figure 6: U.S Forestlands by ownership (million acres)

Figure 7 shows the volume of growing stock by the main ownership categories. Private owners control 70 percent of U.S. timberlands and 58 percent of total growing stock volume, compared with 19 percent and 30 percent for the National Forests.

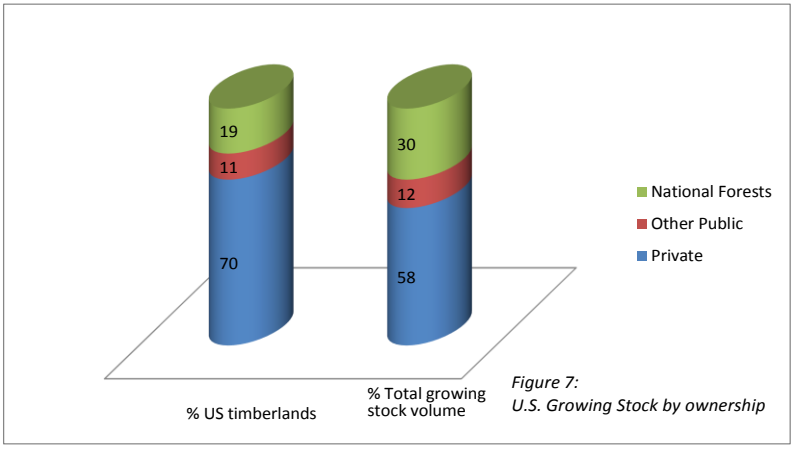
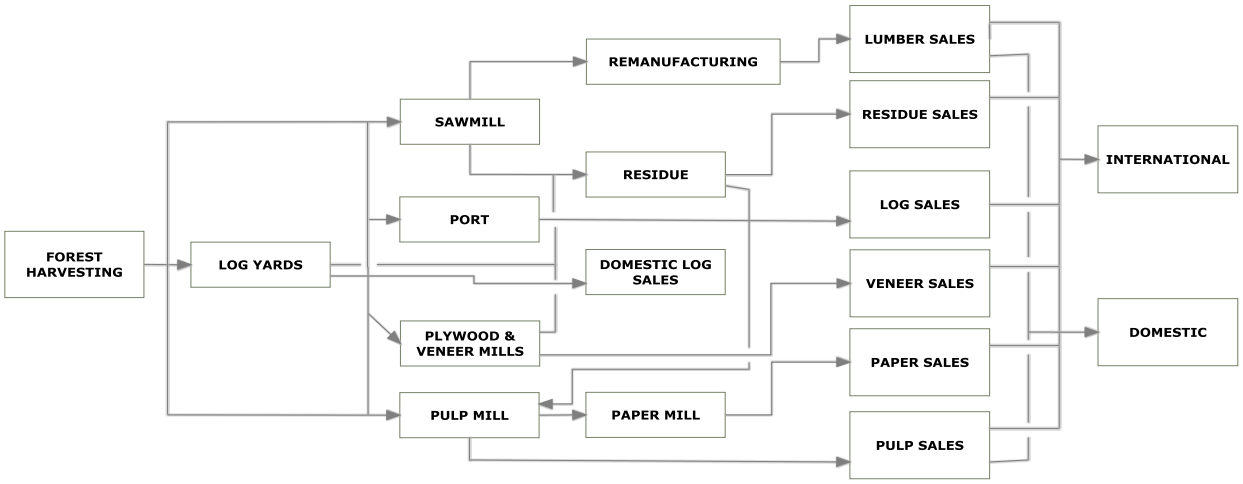


Figure 7: U.S. Growing Stock by ownership

The Forest Products Supply Chain

Figure 8 illustrates the flow of production from the forest to the markets, both domestic and international.

Figure 8: The Forest Products Supply Chain: Forest to Markets (adapted from www.forestoperations.org)



In 2006, the total timber harvest totaled 15 billion cubic feet of which 91 percent came from private forestlands. Roundwood product processed through the mills was primarily converted to saw logs (48 percent), pulp wood (29 percent) and veneer (8 percent) with the balance used for composite panels, and poles, posts, and mulch (Smith, Miles, Perry & Pugh, 2009). The residue after processing, amounting to 87 million dry tons, was then mainly used for fuel (42 percent) and fiber products (41 percent). The forests also yield a range of non-timber products, categorized as edible and culinary, arts and crafts, medicinal and dietary supplements, floral and decorative, and landscape products.

In 2008, the U.S. the forest products industry directly employed over 900,000 people and generated over $200 billion in sales, and some nine million jobs were dependent on paper or packaging as an important part of their daily operations. However, since 2006, the forest products industry has lost 360,000 jobs, more than a quarter of its workforce (American Forest & Paper Association).

Changes Affecting the Forestry Industry

There are significant changes underway in both the management and use of the nation's forestlands (Smith, Miles, Perry & Pugh, 2009):

- Restrictions on timber harvests on public lands have shifted timber operations to private lands in the U.S. and to forests in other countries. This has led to an intensification of the management of many private forests particularly in the South and on the Pacific coast.
- At the same time, there has been very significant divestiture of forestland holding by vertically integrated timber companies to timber management organizations (TMOs) and real estate investment trusts (REITs).

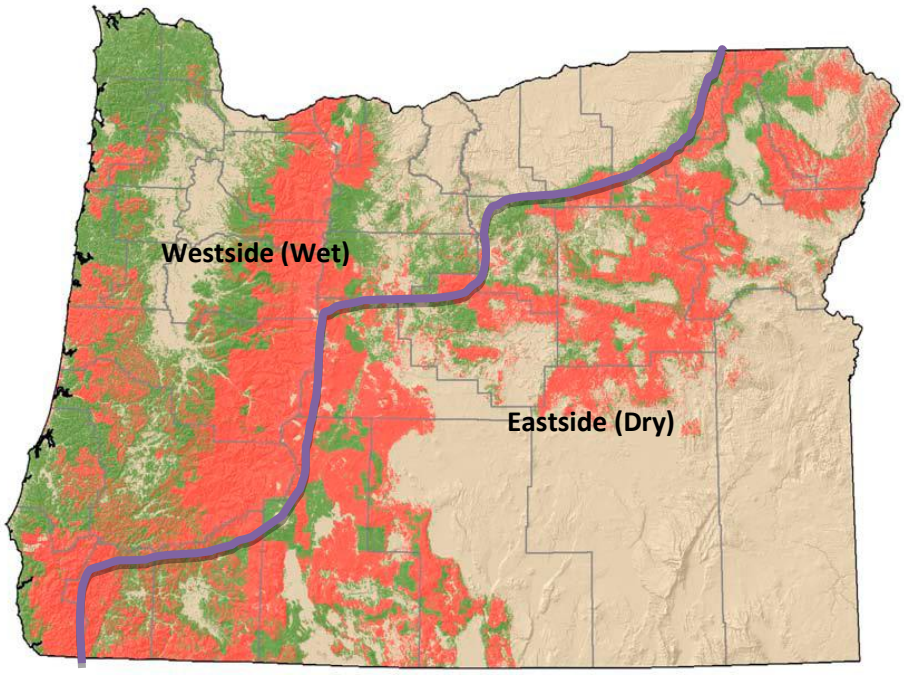
> TIMOs and REITS are essentially tax-driven operations designed to generate short-term (8-10 years) guaranteed returns. The health of the forest is therefore not a primary factor. The profit is in selling logs to China and not to local saw mills. This is third world style exploitation.
>
> Interview

- Expansion of residential development has been evident in many states, as has the loss of forests to urbanization pressures.
- Policies have shifted for controlling wildfires from total suppression to a more flexible approach to removing combustible materials, particularly on public lands.
- There has been a substantial increase in third-party certification for meeting independent standards for well-managed or sustainably managed forests.

2.3 The Oregon Forestry Sector

Oregon's forestlands extend over some 30 million acres, about half the state's land area. Of this, the Federal government owns over 18 million acres (60 percent), with 12 million acres comprising 15 National Forests. Timberland accounts for 24.6 million acres, of which 9.7 million acres are in private ownership, divided 60:40 between corporate and non-corporate forest holdings.

Map 1: Federal Forestland in Oregon



Source: OFR (2010) and Resources Planning Program, Oregon Department of Forestry.

Map 1 shows in red those Oregon forestlands that are federally-owned and managed by the U.S. Forest Service and the Bureau of Land Management; the green areas are in other ownership, both State and private. Oregon's forestlands are divided into two distinct regions: west of the Cascades, excluding the southwest part of the state east of the Coast Range crest, which has moderate temperatures and abundant rainfall (known as the Wet Forest); and east of the Cascades and the southern interior, where the summers are hot, winters cold and rainfall is much lower (known as the Dry Forest). The Westside forests are rich and dense with Douglas-fir, hemlock, cedar and spruce, with a healthy understory of

smaller trees; the Eastside forests are much sparser with ponderosa and lodgepole pine as the dominant species.

According to a 1996 report to the President and Congress, the forestlands of the Pacific Northwest

> …define the region's identity, woven into the lives and livelihoods of the people who call this home…[T]hese forests provide clean water, pure air, a home for plant and animal species, opportunities for recreation, and a place for solitude and contemplation. These same forests also provide a wide range of resources that people demand, including wood for forest products; fish for commercial and sport fishing; lakes, rivers, and mountain for tourism and recreation; and may other resources for a variety of smaller industries. (Tuchmann et al, 1996, p.1)

For decades, public policy required both timber harvests at or near historic levels and increasing environmental protection. These conflicting mandates led to impassioned debates as to which policy goal was most important, and by the late 1980s the conflicts attracted national attention. There followed legislative and legal battles, which culminated in the listing of the Northern spotted owl as a threatened species under the federal Endangered Species Act in 1990. This became the symbol of a chain of events that have had major and continuing consequences for the economy and the ecology of the Pacific Northwest region. Within a year, Federal District Judge William Dwyer issued an injunction that stopped timber sales on Federal lands in most of the Westside forests in Oregon and Washington. The Clinton Administration inherited this issue in 1993 and, in an attempt to bring to an end a period of contentious litigation and community strife, the President adopted the Northwest Forest Plan in 1994.

The Plan was designed to facilitate the recovery of the habitat for the spotted owls and other endangered species and to herald an entirely different approach to forest management on Federal lands. The plan called for science-based forest management built on five broad principles: adherence to national laws, protection and enhancement of the environment, provision of a sustainable timber economy, support for the region's people and communities during the economic transition, and ensuring that Federal agencies work together.

The Plan required coordinated management of lands administered by the Forest Service and the Bureau of Land Management. Much of the Westside lands became subject to restrictive land use allocations. These allocations designated land for uses such as:

- Congressional reserved areas, such as wilderness, wild and scenic rivers, and national monuments;
- Late successional and old-growth reserves as habitat for spotted owls;
- Adaptive management areas for testing alternative management approaches to integrate ecological and economic objectives; and
- Riparian reserves along rivers, streams, ponds, and lakes.

About 22 percent of the total was allocated for sustainable, programmed harvesting.

It is important to note that the Northwest Forest Plan related only to the Westside forests in Oregon. However, the Eastside forests were the subject of a similar set of forces. The Interior Columbia Basin Ecosystem Management Project (ICBEMP) was a preemptive effort to avoid litigation from the Sierra Club and others over riparian logging and its impact on salmon and other fish. The equivalent indicator species of the Northern spotted owl in the east was the pileated woodpecker whose falling numbers

were indicating significant forestlands stress. This led the introduction of the 21-inch screen to halt logging of any tree over that diameter. Thus active management became the accepted approach to dealing with the health of the National Forests across the entire state, with the inevitable impact on timber harvest levels.

Figure 9 shows clearly the precipitous drop in harvest levels over the past two decades – in fact since 1990 the timber harvest from Federal lands has dropped by 90 percent (see yellow line). Overall harvest levels have fallen from a nearly nine million board feet per year in the mid-1980s to under four million board feet since the mid-1990s, with only about 10 percent now being harvested from Federal lands. Levels from private forestlands (see green line) have remained stable over the period at between three to four million board feet (OFRI, 2010). Today, 76 percent of Oregon's timber harvest comes from private forest lands, with 12 percent from federal lands and 12 percent from other public and private lands.

Figure 9: Timber Harvest Levels by Ownership 1993-2007 (Oregon Forest Resources Institute, 2010, p.11)

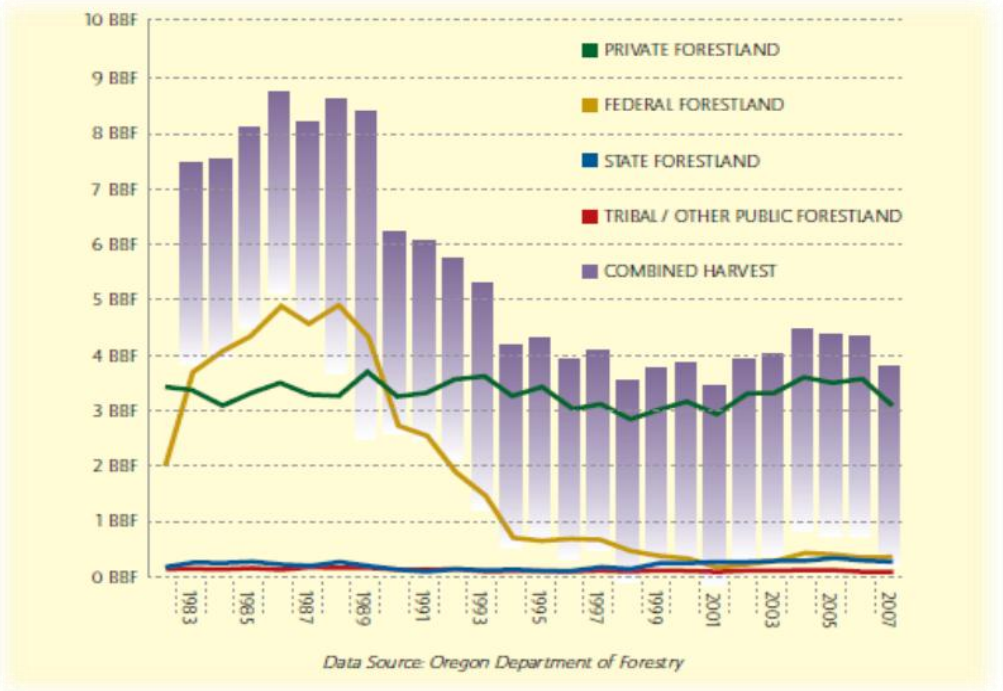


Table 5 shows that the forest industry in Oregon, according to the American Forest & Paper Association (2011), directly employs nearly 37,000 people, of which 60 percent are in wood products, 25 percent in forestry and logging, and 15 percent in pulp and paper.

Table 5: Snapshot of the Oregon Forest Industry (American Forest & Paper Association, 2011)

	Forestry & Logging	Wood Products	Pulp &Paper	Oregon Total
Employment	9,290	22,019	5,556	**36,865**
Annual Payroll Income ($ million)	352	1,180	480	**2,012**
Manufacturing Facilities	--	146	55	**201**
Value of Industry Shipments ($ million)	--	4,042	3,037	**7,079**
Tax Payments (State & local taxes, $mill.)	--	--	--	**158**

Nevertheless, the pulp and paper industry provides the highest annual payroll income per capita at $86,393, compared with $53,590 in wood products, and $37,890 in forestry and logging; and the highest value of shipments per employee at $546,616 compared with $183,569 in wood products.

A report from the Oregon Forest Resources Institute (2011) using different assumptions shows total direct employment in 2009 to be 47,772, not including self-employed and contract employees in jobs such as transportation, heavy construction, business services, and forest labor. The estimate for total employment using an econometric model was 57,000 jobs or about 3.5 percent of the state total. The same report indicates that the average wage for the sector is $43,952, eight percent higher than the state average.

The nature and scope of the transformation taking place in Oregon's forestlands is not easy to capture, not least because twenty years on, it is still a work in progress, and decades of exploitation and neglect cannot be overcome overnight. A major monitoring study of the implementation of the Northwest Forest Plan (Davis, R. et al, 2011) in Oregon's Westside provides some idea of what has happened over the period 1994-2008.

- Unemployment increased from 6 percent to 11 percent across the area covered by the Northwest Forest Plan in line with national trends.
- Total employment in the forest products sector, including secondary wood processing and logging, continues to rise and fall in line with harvest levels. From 2001-2007, total employment declined by 9 percent, with much of the decline on non-federal lands.
- During the period, timber offered for sale on federal lands more than doubled, and the 2008 harvest was nearly double that of 2001. However, timber offers in 2008 were only 75 percent of what was technically available from programmed, sustainable harvesting, and actual harvests were only at half the potential level.
- The area of forestlands designated in the Forest Plan as "late-successional and old growth" declined by 0.5 percent on Federally-controlled lands (about one-third of Federal forestlands was so designated) although there was a decline of 13 percent on nonfederal lands.
- Across the Northwest, the Northern spotted owl decreased in number by an annual rate of 2.8 percent, although the population remained stable in Oregon. There was some habitat loss of 3.4 percent mainly due to wildfire, and barred owls have become a vigorous competitor for prey and habitat.

- Another endangered indicator species, the marbled murrelet is a small seabird that nests in coastal old growth forests. It has declined by 3.9 percent annually as a result of habitat loss caused by fire on federal lands and timber harvesting on nonfederal lands.
- The condition of watersheds has seen a modest improvement overall, with the positive impacts of road decommissioning and natural vegetative growth partially offset by wildfires.

There is no direct equivalent monitoring data for the Eastside forests. The ICBEMP's final environmental impact statement, published in 2000, described the ecological and social conditions and trends for lands administered by the U.S. Forest Service and the Bureau of Land Management over the previous 10 to 20 years. The statement concluded that there was a need for a new management strategy for public lands, given the following:

- Soil productivity was declining in areas with the greatest intensities of timber harvesting, forest road construction, and grazing. The sustainability of the soil ecosystem function and process was at risk.
- Sedimentation and erosion was evident across the watershed as a result of water diversions, impoundments, road construction, changes in silvicultural practices, and excessive livestock grazing. The flow of streams had been impacted by dams, diversions, and groundwater withdrawal.
- There have been some major changes in vegetation, including a 95 percent decrease of western white pine and whitebark pine, a loss of large trees in roaded and harvested areas, a decline of old ponderosa pine, and the rapid spread of noxious weeds throughout the basin and of woody species on dry grasslands ad cool shrublands.
- An increase in fragmentation and loss of connection within and between habitats caused by conversion to agriculture and urban development, grazing, harvesting, recreation, fire exclusion, and mining, has led to declines in plant and animal diversity.
- The overall extent and continuity of riparian areas and wetlands have decreased, with some significant changes in land use and vegetation. Water quality has been affected, and non-point pollution in the form of sedimentation, turbidity, flow alteration, and high temperatures. The result has been the loss of some fish species and significant decreases in the numbers of others.

A Defenders of Wildlife report (Brown, 2000) focused on the increasing susceptibility of the forests to severe wildfires. Human activities, particularly livestock grazing, fire suppression, and logging of larger, older trees, had transformed much of the dry forest in the ICBEMP area from a fire regime of frequent, low severity fires to one of less frequent but high severity fires. These massive wildfires destroy the overstory trees, impact the soils, watersheds, and wildlife habitat, and have serious implications for humans living nearby.

It should also be noted that in the Eastside dry forest counties, unemployment has been in the 13-15 percent range, with poverty levels in 11-18 percent range over the past decade (Davis, E.J. et al, 2010).

Another important impact of harvest restrictions has been on the financial health of Oregon's rural county governments. Historically, counties with a substantial proportion of their land in Federal forests have depended on shared revenues from timber harvests to support their revenues. The dramatic cut in harvest levels in the 1990s had an immediate impact on the functioning of county governments. Congress in 1993 and then through the Secure Rural Schools and Community Self-Determination (SRS) Act in 2000 authorized payments to counties and schools based on receipts during years of historically

high harvests. In Oregon these payments went to 33 out of 36 counties. Funding tied to Forest Service lands was directed to spending on county roads and schools, whereas funding tied to Bureau of Land Management lands could be used for general purposes. The provisions of the SRS Act expired in 2006 but were extended to 2011 on declining scale; final payments to counties will be received in the year ending June 30, 2012.

An economic impact study of the termination of the SRS Act payments (Weber, Lewin and Sorte, 2011) estimated that Oregon faces the prospect of a loss of 3,800 to 4,400 jobs as counties slash personnel and services.

2.4 Toward a Restoration Economy

It is hard to argue that these data show other than modest progress on some indicators and a worsening in conditions on others. Nevertheless, there are indications of a significant paradigm shift underway – from a regional economy that is extractive, confrontational, externally-controlled, and wealth depleting, to one that focuses on forest health, community collaboration and capacity-building, diversified employment opportunities, public financial stability, state-of-the-art infrastructure, a workforce with enhanced skills and knowledge, and greater rural-urban dialogue and linkage. In other words, Oregon is slowly moving toward what can be called a "restoration economy."

The following is a vignette from rootofsustainabilty.org. It provides just one example of the new approaches being developed within Oregon's forests.

> *A mature juniper tree can consume 40 gallons of water a day. In the Klamath Basin, where farmers, environmentalists and tribes are scraping for every last drop of water, the exploding growth of juniper (from 2 million acres in the 1800s to 10 million acres today) is creating even greater demand on the already limited water supply. Agencies, nonprofits and watershed councils have spent years developing strategies to reduce juniper populations and thereby increase water supply for fish and farms.*
>
> *Pulled juniper trees are commonly burned, but Mark Cobb realized the potential of this resource. As an experienced woodworker, Mark knew that juniper had the durability and aesthetics to be a high value product. After working with the local Reach Mill, which employs more than 65 disabled people, Mark created a process where the juniper would be properly kiln dried. He now uses this wood to build furniture and lumber products that he retails, wholesales and distributes throughout the world. Mark's business, West Coast Juniper, has grown to more than $350,000 in annual sales (with 90percent of business conducted online) while providing four full-time jobs. Mark expects his sales to triple thanks to partnerships with the Klamath Tribes and Sustainable Northwest.*

Figure 10 shows the components of the paradigm shift to a restoration economy. It uses as its organizing framework the wealth creation approach referred to in Chapter 1 as developed through the Ford Foundation's *Wealth Creation in Rural Communities* initiative. For each of the seven forms of wealth, there is a brief description of the old paradigm, linked to the vision that many people, communities, and organizations in Oregon are now adopting – the new paradigm.

Figure 10: Wealth Creation Framework and the Transition to a Restoration Economy

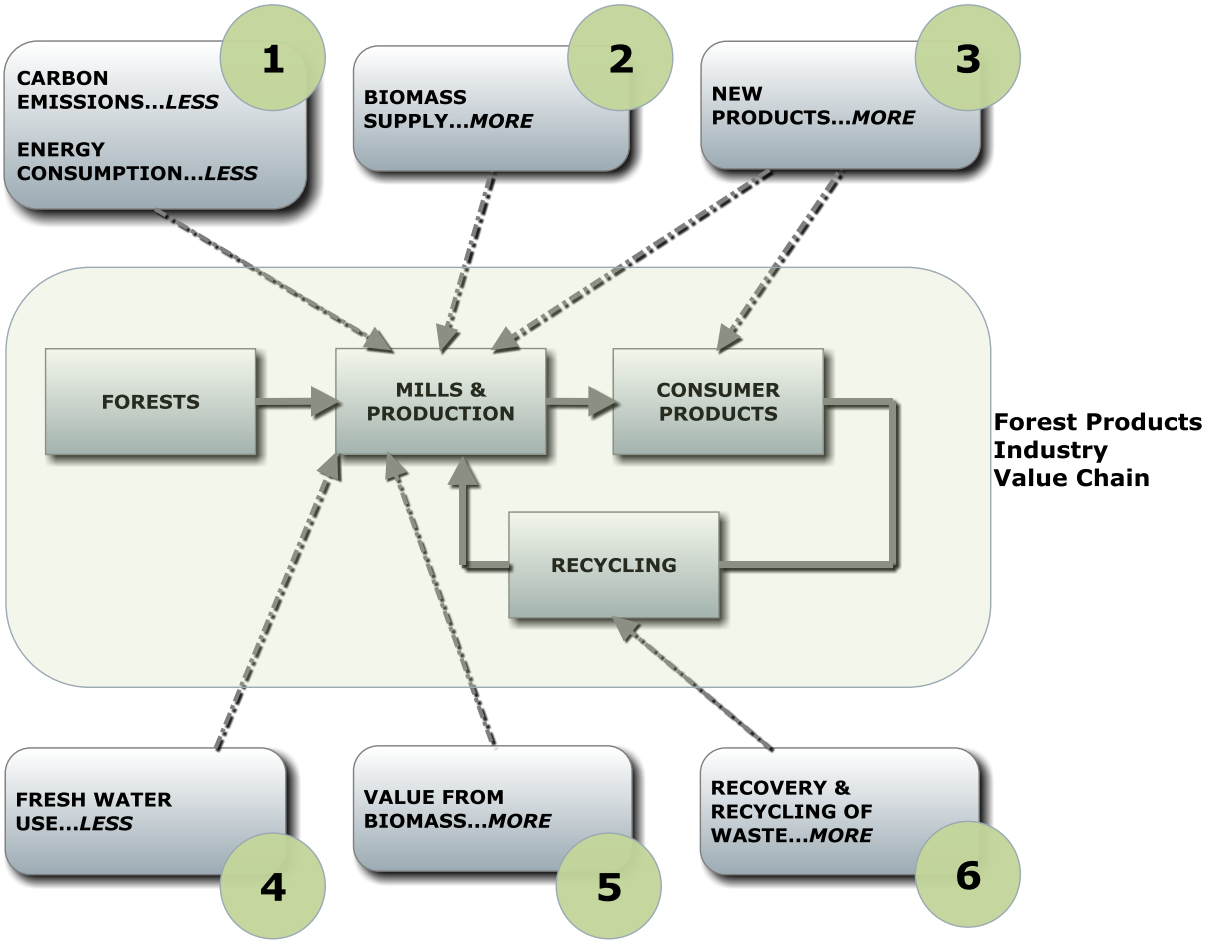
	Old Paradigm	New Paradigm
Natural	Policies allowed historically high levels of harvesting, promoted active fire suppression, excessive livestock grazing, removal of old growth over story, reduced water health, and increased risk of catastrophic fire and disease. Spotted owl as the indicator of rapidly declining forest health.	Policies supporting forest restoration, where forests are actively managed to restore forest health (including trees, water, habitats, and aesthetics), thin overstocked forestlands to reduce fire and disease risk, and ensure a predictable, sustainable supply of timber harvest.
Social	Major conflict between government agencies, timber industry, communities, and environmental groups, fought through legislation and courts. Growing powerlessness of communities.	Focus on community-based collaboration where forest owners, environmental groups, and industry create forest restoration plans, and avoid continuing strife and litigation. Higher levels of self-determination at the community level. Emphasis on community capacity building and leadership development.
Individual	Loss of employment opportunities as timber harvesting on federal lands severely restricted; families and communities under pressure from poverty and unemployment.	Shift in employment opportunities from industrial logging to complex forest restoration contracting. Long-term prospects improve as economic development supports diversification.
Financial	Loss of household income as jobs disappear; payments to local governments based on timber harvests decline; dependence upon Federal SRS payments to keep county services and schools; soon to go away.	Incomes stabilize and rise as more jobs created in restoration and local value-added economy. Decoupling of county finances from timber harvest levels, and new revenue approaches have to be found to support county and community services.
Built	Closing of mill and other infrastructure essential to a working wood products industry.	Development of new infrastructure including local-scale mills, biomass energy plants, and support infrastructure. Broadband critical.
Intellectual	Skills of large scale logging and milling operations no longer in demand,	Development of new skills and knowledge base for managing forests for economic, social, and ecological goals. Development of entrepreneurial ventures to seize market opportunities from forest restoration.
Political	As population declines in rural regions, loss of political representation in state capital; as policy and legal battles become widespread, more intervention from outside region, less control at local level	Growing appreciation of rural-urban interdependence driven by "buying local/regional" preferences, and enlightened leadership around "One Oregon" message. Greater local engagement and control in management of Federal lands.

So where are the opportunities that will make the vision a reality? Here are two approaches – one from the forestry and forest products industry, the other from a nonprofit group with a mission to support the creation of a restoration economy.

The Forest Products Industry Technology Roadmap

A process sponsored by Agenda 2020 Technology Alliance, the Institute of Paper Science & Technology at the Georgia Institute of Technology, the American Forest and Paper Association, and the U.S. Department of Energy led to the production of the *Forest Products Industry Technology Roadmap* (Agenda 2020 Alliance, 2010). This roadmap, among other things, provides recommendations for six interventions that need to be made into the value chain in order to create a more sustainable and competitive forest products industry. Figure 11 shows the main components of the forest products industry value chain and the proposed interventions.

Figure 11: Sustainability interventions into Forest Products Value Chain (adapted from Forest Products Industry Technology Roadmap, 2010, p.4)



These interventions are focused on:

1. **Carbon Emissions and Energy Consumption** – More efficient generation and greater use of energy from non-fossil fuel sources, together with advanced techniques for capturing carbon dioxide emissions.
2. **Biomass Supply** – Improved forest management systems and development of tree types designed and grown for specific end-uses.
3. **New Products –** Development of new bio-based composites and nano-materials, improved packaging techniques, and smart features for paper and wood products.
4. **Water Use** – Reduced water use in pulping and papermaking, and close-looped water systems for treatment and re-use of effluent.
5. **Biomass Value** – Development of new processes for conversion and use of biomass, and of new opportunities to displace petroleum-based products.
6. **Recovery and Recycling** – Improved sorting, new ways of recovering materials and reuse within production and energy processes, and products designed for deconstruction or recycling.

Some of these interventions may well require substantial long-term and large-scale investments before they achieve widespread adoption, and others, such as "designing and growing trees for specific purposes", may raise questions as to their compatibility within a restoration economy framework. However, many give a glimpse of what might be possible in terms of creating new business opportunities and reducing environmental impacts of forestry and forest products operations. Both are critical to economic prosperity, community well-being, and ecological sustainability in rural Oregon.

Sustainable Northwest

Sustainable Northwest, based in Portland, Oregon was established as an independent nonprofit organization in 1994 – at the same time as the adoption of the Northwest Forest Plan – by concerned political leaders from Oregon and Idaho who saw the need for a non-partisan entity that could help find solutions to the environmental, economic and social challenges faced by citizens, leaders, and communities in the Northwest. Since then, Sustainable Northwest has demonstrated its ability to bring together multiple, often opposing sides of an issue, and to craft and promote solutions through a collaborative process.

Sustainable Northwest sees four important forces at play: the forests of the Pacific Northwest are in urgent need of restoration, there is a talented labor force eager for opportunities to get back to working in the woods, there are local businesses seeking sustainably harvested wood to turn into high value products, and there is growing consumer interest and markets for locally-sourced materials. Bringing these together to forge a new economy based on diverse enterprises, jobs in forest restoration, use of small diameter timber, and regional markets for sustainably produced forest products has become the impetus for Sustainable Northwest's work.

This work can be summarized as the promotion of:

- Collaborative, community-based solutions;
- Business models and markets that are sized appropriately to the available natural resource base, and support regional and national "green" economies;
- Networks that connect people and ideas, and foster innovation; and

- Public policy that supports sustainable natural resources management.

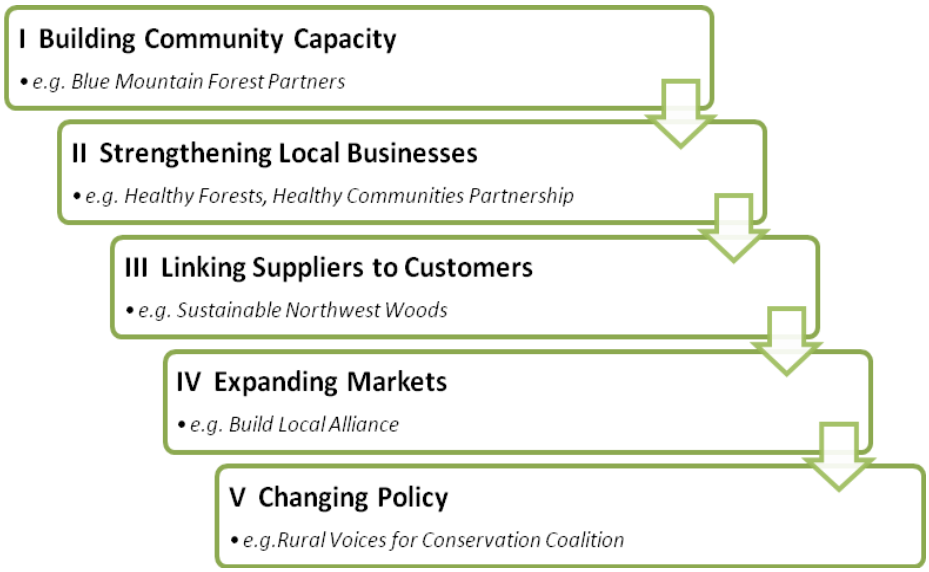
Sustainable Northwest operates at three levels:

- At the local level to help build strong rural communities that conserve and restore forests and rangelands.
- Across communities by building networks that advance and create a strong collective voice for community-based land stewardship.
- At the federal and state policy level, through presenting policy solutions that strengthen investment in sustainable natural resource management.

Figure 12 provides a graphic illustration of the main components of Sustainable Northwest's interventions into the forest products industry value chain (*based on discussion with Martin Goebel, 11/28/2011*):

- The process (Level I) begins in the rural communities that have had to endure the impact of the dramatic changes of forest management practices, particularly on federal lands, and need support in charting a new future for themselves, based on collaboration and community-based solutions.
- The next level (II) focuses on the sourcing of wood that meets standards for sustainable forest management and harvesting. Support is given to private forest owners in obtaining Forest Stewardship Council certification and producers who source material from public lands forestry projects designated and monitored by active collaboratives.

Figure 12: Sustainable Northwest Interventions in the Forest Products Value Chain



- The third level (III) is direct engagement in the marketplace through a wholesaling operation that links suppliers across the Pacific Northwest and markets in the region and further afield.
- Organizing and expanding the market for sustainable wood products is the fourth level (IV), working with architects and builders in the cities of Portland and Seattle so such products are specified in new development projects.

- The final level (V) is concerned with providing a voice for policy change in Washington DC and state capitals based on the experiences and practices of what is working on the ground among communities, forest owners and managers, and businesses to advance a restoration economy in the Pacific Northwest.

I. Building Community Capacity – *Blue Mountain Forest Partners*

USDA Forest Service

The Malheur National Forest extends over 1.7 million acres of eastern Oregon. It is a beautiful landscape of high desert grasslands, sage and juniper, pine and fir trees, together with alpine lakes and meadows. The forest extends across the two counties of Grant and Harney which have a combined population of about 13,500. Two-thirds of Grant County and three-quarters of Harney County are Federal lands. The largest settlements are Burns (3,000 people) and John Day (1,700 people).

Unemployment levels are in excess of 16 percent and poverty rates are over 15 percent. These communities have relied upon their natural resources of timber, agriculture, and ranching for generations, but now they are struggling to cope with changing market conditions and reduced economic opportunities.

There are two collaborative groups of local residents that are committed to work with the U.S. Forest Service to ensure that the National Forest is "being managed to restore ecological resiliency in a socially acceptable manner that provides economic benefit to these communities." (SNW, (1)). One of these is Blue Mountain Forest Partners that operates on the north end of the Malheur National Forest in Grant County. Sustainable Northwest has been a partner since its inception in 2006 helping to build community capacity to be active members of the collaborative.

> The US Forest Service and the Bureau of Land Management are permitted to pursue stewardship contracting for forest restoration projects. This allows contracts to be awarded on the basis of "best value" –allowing collaborative, ecological, economic, and social objectives to be factored in alongside price.
>
> Daly, C. (2006)

Forest management activities have been directed toward forest restoration and hazardous fuels reduction to decrease the risk of large wildfires. In the Malheur National Forest, these activities have been achieved through timber sales, service contracts, and stewardship contracts. The success of these collaborative efforts is seen in three ways (SNW, (1)):

- The first is that there have been no appeals or lawsuits for five years relating to the Malheur National Forest – this is particularly significant given the contentiousness of reduced timber harvests on public lands.
- Secondly, the first restoration project developed through the collaborative in 2006 was just 7,200 acres in size, but more recent projects are at landscape scale at over 40,000 acres. These projects are designed to protect lives and property from major wildfires, improve forest health

through thinning, and reducing fire hazard and insect and disease risk through prescribed burning.

- And thirdly, there are multiple benefits to the local economy as small diameter wood harvested through thinning operations is being put to use as biomass for local community heating systems. These benefits include jobs in sourcing the fuel and restoring the forest and the local processing of compressed logs, the introduction of new ways to heat schools, hospitals, and homes that provide substantial savings over imported oil and natural gas, and funds for reinvestment in much-needed public infrastructure and services.

II. Strengthening Local Businesses – Healthy Forests Healthy, Communities Partnership

HEALTHY FORESTS, HEALTHY COMMUNITIES
A NORTHWEST PARTNERSHIP

Another example of collaboration promoted and administered by Sustainable Northwest is the Healthy Forests, Healthy Communities Partnership. The partnership's goal is "to create a network that builds awareness of, and demand for, regionally and responsibly produced wood products, and enhances rural capacity to produce and market goods that benefit both entrepreneurs and forest ecosystems."

Northwest Windsor Chairs, Klamath Falls, Oregon

There are currently over 70 participating companies in Oregon, Washington, California, and Montana. The partnership provides a range of marketing services, such as product differentiation, market research, media exposure, tradeshow attendance, marketing materials, and business-to-business connections. It also offers capacity-building services in the form of training and workshops, financial systems support, business planning, and peer-to-peer learning.

A particular focus of *Healthy Forests, Healthy Communities* is on trees that were used mainly for fuel and firewood because they were not seen as having much commercial value in the commodity markets. The characteristics of the wood from these under-utilized and small diameter species are particularly attractive for quality furniture, flooring, paneling, molding, and millwork. Creating markets for this wood as part of forest restoration activities adds value and economic opportunity.

III. Linking Suppliers to Customers – *Sustainable Northwest Wood, Inc.*

In 2008, Sustainable Northwest formed a for-profit subsidiary, Sustainable Northwest Wood, Inc. with investment capital from the Ford Foundation and the Meyer Memorial Trust. It operates as a "wholesale lumber yard that connects local mills to growing green building markets, serving both regional producers and conscientious consumers." A wide range of products are stocked including dimensional material, interior and exterior finish lumber, and native hardwoods. All products are from

the Pacific Northwest and grown on forests managed either to the standards of the Forest Stewardship Council (FSC) or as part of the Healthy Forests, Healthy Communities Partnership.

After three years in operation, the company has been on target with its sales and is on its way to profitability. Its success has been helped by the relative strength of the 'green" building market in Portland during what have been challenging times for the construction industry nationwide. Sustainable Northwest Woods has been able to supply local sustainable wood to this market and has developed a reputation for reliability. Providing evidence of a demand for FSC lumber has encouraged larger lumber yards to carry more inventory particularly for sustainable structural commodities, which in turn is forcing the company to refocus its efforts on high value, low volume markets. As Ryan Temple of Sustainable Northwest Wood notes, "Eventually, what we're doing that's innovative moves into the mainstream. From a mission point of view and for a forest and community sustainability point of view, that's great. From a business point of view it's a challenge" (Sustainable Business Oregon, November 18, 2011).

Rendering courtesy GBD Architects and SERA Architects

The Oregon Sustainability Center, a seven-story, $64 million project, is planned to go up in the eco-district of Portland State University's downtown campus. The building hopes to attain the Living Building Challenge certification from the Living Future Institute and will provide critical data for the future construction of sustainable buildings elsewhere. The Center plans to utilize both solar and geothermal technology. It is striving to meet a triple net-zero status, where energy, water, and waste are generated, utilized, or recycled on site. The local sourcing of sustainable materials is an important aspect of the project.

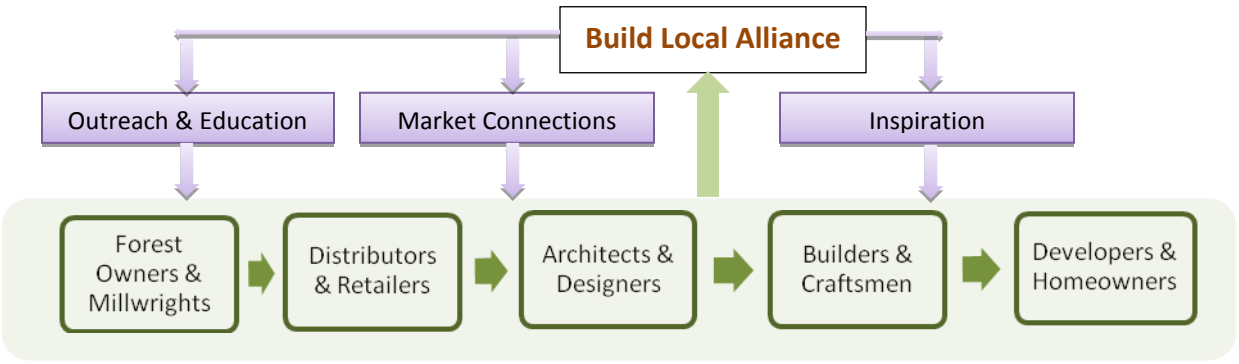
Sustainable Northwest Wood works with 64 locally-owned mills and wood products businesses around the region. A focus is specialty wood, such as juniper, white oak, and madrone, and making them available to the Portland market.

Challenges going forward include maintaining adequate supply to match growing demand especially when the construction industry comes out of recession. Large mills can readily gear up, but smaller mills without access to capital are less able to do so. Another cause for concern is the lack of differentiation by customers and in pricing between different levels of FSC certification, so that forest owners that supply 100 percent sustainably grown wood with all the extra care and costs involved are unable to obtain a premium over FSC plantation products.

IV. Expanding Markets – *Build Local Alliance*

Back in the summer of 2005, Build Local Alliance cofounder, Stephen Aiguier, and fellow wood users, knew that they were determined to use local, responsibly grown wood, but they were having problems finding and getting it. At the same time, cofounder Peter Hayes, and fellow forest owners, believed that their forests were growing local, responsibly grown wood but had problems reliably connecting with wood users to whom this mattered. So they teamed up in hopes of creating a single solution to their two problems – and the BLA was born. Recognizing the success of the Farmer-Chef Connection in solving a parallel pair of problems, Augier and Hayes asked each other "why not adapt the idea and apply it to wood? (www.buildlocalalliance.org).

Figure 13: Build Local Alliance and the Value Chain



Build Local Alliance's aim is to improve the vitality of local forests and related human communities by connecting local, responsibly grown and processed wood with local projects. It brings together participants along the "responsibly managed" value chain (Figure 13), through three strategies: educating the business community and consumers on the availability of local, responsibly managed wood choices; supporting connections between leaders in all links of the local wood chain, to increase local business services and products; and showcasing opportunities and examples that demonstrate the value and possibilities of using local, responsibly-managed wood.

V. Changing Policy – Rural Voices for Conservation Coalition

Sustainable Northwest is active in forestry policy through regional organizing, congressional education, and building alliances with diverse interest groups. Common ground is sought through collaboration despite the highly polarized national debate around restoration and wildfire policy. The policy program translates lessons learned in local community sustainability efforts into policy and institutional reform at the regional and national levels. This includes the Rural Voices for Conservation Coalition (RVCC) for which Sustainable Northwest plans and organizes all RVCC activities, distributes information on policy developments, raises funds to support the activities of the partners, and works to connect the partners with journalists.

RVCC comprises rural western, regional and national organizations that have joined together to promote balanced conservation-based approaches to the ecological and economic problems facing the West. Its goals more specifically are to:

- Develop and promote ecologically responsible and economically equitable solutions to the problems inhibiting the restoration and maintenance of Western forests.
- Increase support for federal funding of restoration and maintenance of public lands and rural economic development.
- Advance legislative ideas and influence legislation proposed by others.
- Strengthen the voices of rural leaders in conservation and economic development policy.

RVCC convenes an Annual Policy Meeting at which participants define its priority policy issues, messages and solutions for the coming year, and twice yearly, organizes a "Western Week-in-Washington" give members a chance to convey shared messages and solutions to Congressional staff, Federal land management agency personnel and interest groups.

A critical part of RVCC's work is the development of issue papers to provide perspectives on current problems and introduce proposed solutions. For instance, the May 2011 Issue Paper packet included RVCC's FY 2012 Appropriation priorities, a paper on sustainable biomass energy (in conjunction with the Coalition for Eastern Forests and Communities), and a paper on rural capacity for conservation and job creation.

The Dry Forest Investment Zone

Map 2: The Dry Forest Zone

Another example of Sustainable Northwest's collaborative work, which brings together ecological, economic, and community dimensions of forest restoration, is the Dry Forest Investment Zone (Davis E.J. et al, 2010). This is a five-year initiative to advance sustainable forestry, economic development, and community resilience in the dry forests of eastern Oregon and northern California. It is being funded by the U.S. Endowment for Forestry and Communities, USDA Rural Development, and the Ford Foundation. Sustainable Northwest is partnering with Wallowa Resources, Enterprise, Oregon; the Watershed Research and Training Center in Hayfork, California; and the Ecosystem Workforce Program at the University of Oregon in Eugene, Oregon.

The Dry Forest Investment Zone consists of 15 counties across eastern Oregon and northern California (see Map 2) that share similar socio-economic challenges such as poor market conditions for wood products, and high levels of poverty and unemployment.

There are three inter-related components to the initiative: local energy generation, healthy forests, and strong communities.

Local Energy – Throughout the zone, local communities are collaboratively and actively managing the health of nearby forests, so that they can use the byproducts of forest restoration to generate energy

for heating and powering local schools and municipal buildings. Small diameter trees removed during forest restoration that would otherwise be discarded or burned in the forest are now being manufactured into condensed wood pellets and bricks. These products are burned in wood-fired boilers to generate thermal energy for the local community.

> *In December 2010, Malheur Lumber Company, in John Day, finished an expansion of its existing lumber mill to integrate the production of wood-based fuels. Malheur Lumber is the last remaining mill in the region and this recent expansion has received strong support from two local collaboratives – the Blue Mountain Forest Partners and the Harney County Restoration Collaborative – since it is "appropriately scaled" to support their restoration goals for the Malheur National Forest. Small diameter trees removed during forest restoration, that otherwise would be piled up and burned in the forest, will now be manufactured into wood pellets and bricks.*
>
> *Crucial to the economic success of this business expansion is an integrated manufacturing model that maximizes value from each piece of wood at the facility. Malheur Lumber now manufactures a suite of products to produce multiple revenue streams including lumber, shavings for animal bedding, wood pellets and bricks, and thermal energy (heat) to dry lumber.*
>
> *The expansion at Malheur Lumber has allowed the company to retain 75 employees and created ten new jobs.*
>
> Sustainable Northwest (2)

Healthy Forests – Sixty-eight percent of the land within the Dry Forest Investment Zone is federally managed, comprising mainly dry pine and mixed conifer forests and high desert grassy range lands. Without proper management, these forests are at risk of drought and catastrophic wildfire, threatening local communities and their economies that depend on forest resources.

Throughout the zone, members of local communities, the forest industry, and the federal government are working together, with the help of Sustainable Northwest and its partners, to ensure that the National Forests are actively managed and healthy.

Strong Communities – Communities in the zone are shaped by the environmental and economic challenges they face. They also possess strong leaders, a drive to collaborate, and the ability to innovate. Community leaders and collaborative groups are creating local jobs, ensuring that the forests are healthy, and are finding cost and energy savings in local resources. In doing so, they are making the places they call home resilient and strong.

> *Litigation is good for stopping bad things happening but not effective in getting good things to happen. The right people at the right time have to craft something that works.*
>
> Interview

Twelve community-based natural resource organizations and collaborative groups are participating in a program to build their organizational strength, so that they are better able to accomplish land stewardship, explore integrated woody biomass utilization, and pursue improved federal and state forest policy. The program includes organizational assessments, peer learning, training workshops and webinars, and one-on-one technical assistance.

The Restoration Economy – Real or Imagined?

If the restoration economy is to be successful in the long-term, there has to be a sustained demand for the products generated from the forests. The trends seem promising for the two main streams of wood products: those that are certified as having been harvested from sustainably managed forests, and those generated through the thinning of forests and converted for biomass energy purposes.

Demand for Certified Wood Products According to Green Outlook (McGraw-Hill Construction, 2011), the U.S. market for green building grew from $10 billion in 2005 to $42 billion in 2008, and was projected to rise to between $55 billion and $71 billion by 2010. McGraw-Hill Construction estimate that by 2015, 40-48 percent of new non-residential construction by value will be green, equating to a market of $120 billion to $145 billion. In addition, there is a growing market for green retrofitting and renovation which in 2010 was estimated to represent 7-12 percent of the retrofitting and renovation market valued at $3 billion. In spite of the recession, this growth was driven by very large institutional projects particularly in the education and health care sectors, and by a supportive policy environment at both the federal and state levels, and research showing multiple benefits of green construction.

Although much of this activity is focused on achieving energy savings and more effective management of water and waste, an increasingly important factor has been the use of LEED in project specifications. In 2009, LEED was used in two-thirds of high value construction projects, and in over a quarter of all building projects. This has particular relevance for the forest products sector as LEED includes credits for the use of Forest Stewardship Council (FSC) certified materials. The FSC specification rate increased from 11.6 percent in 2006 to 20 percent in 2009. The sectors where FSC specification increased the most was in dormitories, education, manufacturing, hotels, and public buildings. This was particularly evident in the Mid-Atlantic and Pacific Northwest.

Demand for Biomass The Energy Information Agency's 2012 Annual Energy Outlook projects that increased generation from non-hydro renewable energy resources in the electric power sector will account for 33 percent of the overall growth in electricity generation from 2010 to 2035. The non-hydro renewable share of total generation will increase from four percent in 2010 (of which 46 percent was derived from wood and wood-derived biomass) to nine percent in 2035.

Biomass generation is projected to increase nearly four-fold, driven by the federal Renewable Fuels Standard, and by the co-firing of biomass with coal increases over the projection period, induced partially by state-level Renewable Portfolio Standards as well as favorable economics in regions with significant forestry residues. Traditional Industrial combined-heat-and-power generation in sectors such as the pulp and paper industry continue to contribute to overall biomass generation (EIA, 2012).

Declining County Revenues However, in spite of these seemingly favorable market indications, the shift from an extractive to a restoration economy is a slow process, and there are many challenges that still remain to be addressed. The loss of revenues to Oregon's rural counties, resulting from the cessation of timber-related payments, will be a major crisis for communities already struggling with high levels of poverty and unemployment. The economic opportunities from restoring the forests, biomass, and other entrepreneurial ventures may yield revenues and generate savings in the medium to long-term but will not be sufficient in the short-term to maintain essential public services. A Governor's task force (2009) examined ways in which the crisis might be averted and concluded that it would take responses from every level of government – county, state and federal – to have any impact. Many of the task force's recommendations were controversial, including raising taxes and calling for at least a doubling of timber

harvests from public lands, and some required state constitutional changes, others federal legislation. The concerns for possible job losses, the compromising of public health and safety, and the closing of schools could be major tests for the restoration paradigm.

Encouraging Developments On the other hand, there are indications that the restoration approach is gaining some traction. In May 2011, Senator Wyden, the chair of the Senate Subcommittee on Public Lands and Forests, held a hearing on his bill, The Oregon Eastside Forest Restoration, Old-Growth Protection and Jobs Act (S.2895). The purpose of the bill was to protect old growth forests and refocus national forest management in eastern Oregon on science-based restoration. Timber harvesting would be restricted primarily to small diameter trees and would serve landscape-wide forest and watershed restoration goals. One of the most important aspects of the bill was that it codified ongoing agreements between conservationists, the timber industry, and the community-based collaboratives, with the support of the U.S. Forest Service.

In February, 2012, the U.S. Department of Agriculture announced an allocation of $48.4 million to Eastern Oregon to support projects in the Malheur and Fremont-Winema national forests. The funding will be used to help restore more than 422,000 acres of forest, and will retain or create some 240 jobs over the next ten years. The money comes from the federal Collaborative Forest Landscape Restoration Program, and will be directed towards three community-based collaboratives, all supported by Sustainable Northwest.

2.5 The Rural-Urban Dimension

The past 20 years of turmoil and transition in Oregon's forestlands have attracted national attention and generated much legislative and legal activity. But they also highlight an important feature of the state's cultural and political reality.

> [O]ver the last several decades, the Oregon story has been divided into a rural narrative and a separate urban narrative. The separation of stories, and therefore communication, has created an imbalance and difficulty to developing solutions that benefit Oregon as a whole, thereby furthering the notion of the "urban/rural divide". (www.rootofsustainability.org)

As Seltzer et al (2011a) note, "Differences in such things as economic base, geography and landscape, settlement patterns, and population within a state…almost always feed political, social and cultural divisions…In Oregon these divisions manifest themselves in pairs of opposing terms like wet and dry, east and west, coastal and inland, red and blue, metropolitan Portland and rural Oregon…" (p.11). They argue that:

> The urban-rural relationship can…be characterized by both interdependence and tension. Make no mistake: this is a tension born of interdependence, not just difference. With this diversity of views built into the very design of the institution we know as Oregon, our success in the coming decades depends on our ability to make constructive use of that interdependence while finding new means for either accommodating or looking past our differences (Seltzer et al, 2011, p. 13).

A study of the evolving economic relationship between Portland and its rural periphery (Holland et al, 2009; Holland et al., 2011) shines some light on the question of interdependence. The main findings were:

- As Portland has grown over the past quarter century, its core economy has grown from being slightly smaller than the periphery economy in 1982 to being 50 percent larger in 2006.
- Commuting linkages between the Portland core and the rural periphery have grown stronger, both in the number of commuters and relative to the size of the labor force. The core depends increasingly (though modestly) on the periphery as a source of labor, but it depends on it less than in previous decades as a market for its goods and services. The periphery in turn increasingly depends on the Portland core as a source of personal income for its residents, and has continued to purchase needed goods and services from the core while increasing it local production.
- Core-periphery trade flows have weakened as the core has expanded trade to other regions and the periphery has become more self-sufficient. The periphery depends less on Portland as a market for its goods and services than it has in previous decades.
- Growth in exports from the periphery has a significant cross-regional impact on the Portland core. The Portland core benefits more from a given level of growth in periphery exports than the periphery benefits from the same level of growth in core exports, although given the size and growth of the Portland core economy, Portland core exports have a significant impact on the periphery.
- Both core and periphery, however, have a significant interest in each other's economic health: 18 percent of the impact of a shock to the periphery economy leaks across to the core economy. Likewise, 7 percent of the impact of a shock to the core economy spills over to the periphery[3].

There is also a special "Portland factor" to be taken into account that has direct import for this case study. Seltzer et al (2011b) point to the city's distinctiveness and competitive advantage, which rests "on its location in a spectacular setting, framed by mountains, characterized by abundance, and with ready access to wilderness, ocean beaches, and a vital working landscape." (p. 162). They go onto make the assertion that "if the extent of Portland's embeddedness in its rural periphery is unique among the nation's cities, then Portland's competitiveness depends on the health of its surrounding rural areas to a greater extent than is true for other U.S. cities" (p. 162).

This then is the context for looking at rural-urban linkages within the forest products sector in Oregon. Using the principles underlying Porter's industry cluster approach[4], Martin (2011) suggests that it is important for rural clusters to be tied to the nearest metropolitan area. She argues that this is because many value chains involve global actors and reaching these requires a local partner that is globally connected. Links between rural producers and urban centers can also help the development of niche markets that can be tested and refined in adjacent urban markets before they are launched globally (p. 151).

[3] An earlier study (Waters et al, 1994) estimated that the reduced timber harvest following the listing of the Northern spotted owl as a threatened species under the Endangered Species Act caused an estimated loss of 4,400 jobs in Portland. Most of this impact would have come from reduced household spending by the periphery for core-produced services. This represented less than 1 percent of the Portland core's 534,000 jobs, but the loss of 4,400 jobs in the core represented about 14 percent of the total regional economic impact of timber-harvest reductions in the western Oregon periphery (Oregon State University, April 2010, p.3).

[4] Clusters are defined as "geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions…in a particular field that compete but also cooperate" (Porter, 2000, p.15).

Martin points to several initiatives in Oregon that are seeking to establish tighter relationships between rural and urban parts of these clusters (or value chains). She sees these as representing investments that will reduce transaction costs, increase value, and improve profitability, and transform rural-urban relationships from arms-length, competitive, market-driven transactions to longer-term relationships based on honesty, integrity and trust. The key is differentiation – increasing profitability by branding and marketing products to specific market segments that may be willing to pay a price premium.

In the forest products sector, two differentiation strategies are being pursued, both of which have been described earlier. The first is differentiation through certification, a signal from a reliable third party that a product meets acceptable standards for quality. The Forest Stewardship Council provides certification that assures the consumer of forest products that they are from responsibly harvested and verified sources. The other form of differentiation is through direct marketing in an effort to connect producers to consumers. Sustainable Northwest Woods and Build Local Alliance are two examples.

As Martin suggests, the strengthening of rural-urban connections is essential for improving cluster or value chain performance. Portland, as well as other urban centers, is home to sophisticated, knowledgeable, quality-sensitive customers, who can help rural producers gain insights into the direction of future demand in larger markets. Portland's reputation, according to Cortright (2007), for its concerns for sustainability has evolved into a unique geographic context that depends on a vital rural periphery.

2.6 Conclusions

This case study attempts to tell the story of a rural economy in transition. This transition has been hard, is still continuing and its eventual outcome is not certain. The forestry sector, globally, nationally and regionally, is itself going through a major transformation as markets evolve, environmental awareness increases, and technologies advance. Within that context, the Oregon forestry industry has had to contend with dramatic change, as harvesting from federally-managed lands was brought to a standstill by court order and a new regime of science-based forest management was introduced. The impact on the rural economy and rural communities has been severe, and the road to recovery has been slow, and hindered by the recession.

Nevertheless, there is a very important transition underway, characterized in the case study as a shift from an extractive to a more sustainable natural resource economy – to a restoration economy. This shift encompasses some important elements of rural wealth creation as the emphasis has moved to finding ways to mitigate conflict through community and stakeholder engagement and collaboration, to facilitating greater local control over forest management decisions on public lands, and to embracing the multiple forms that wealth can take in rural Oregon.

At the center of these shifts is Sustainable Northwest, a nonprofit organization that acts as an intermediary in the forging of a value chain that connects sustainable forest management practices to both the premium urban markets for high quality and locally-grown wood products, and the local and regional markets for wood biomass for energy production. Although these represent important and growing markets, the linking of supply and demand has been and continues to be a challenging process. What has been accomplished over the past 20 years has been significant but the pace has been too slow for the rural communities that have been undermined by the disappearance of the extractive forest economy. However, there is clearly considerable support and commitment to making the restoration

economy a success from the Federal government to the Governor to forest land owners, wood products companies and community leaders.

An intriguing dimension to this transition has been the perceived urban-rural divide that is reflected in the political, social and economic discourse in Oregon. But there is also strong interdependence between the urban centers, particularly Portland, and the rural hinterland. Much of the city's distinctiveness and competitive advantage is rooted in its connections to the natural environment that surrounds it, and that the success of the restoration economy will increasingly depend on strengthening connections between rural producers and the sophisticated urban consumers in Portland and to other cities in the Pacific Northwest and beyond.

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Section 3
Building a Regional Food System

A Case Study of Market Umbrella in the New Orleans Region

Photo: Market Umbrella

Megan M. Carroll and Jennifer M. Jensen

Contents

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Thanks to Market Umbrella for providing the photographs used in this report.

Errors of fact or interpretation are entirely those of the authors.

3.1 Introduction

There are four principles that underlay the wealth creation approach:

1. Respect people and their places.
2. Help people collaborate and tap new markets based on shared values.
3. Build many kinds of wealth so everyone benefits.
4. Keep wealth local.[5]

Across the nation, the local food movement embodies these values. Regional food cultures and local economies are finding new expression through the rapid growth in direct-to-consumer sales via farmers markets, community-supported agriculture (CSA) farms, and other local food institutions.

This report examines how regional food systems offer a practical way to build rural-urban linkages and grow multiple forms of wealth in rural places. We explore the case of New Orleans and Market Umbrella, a nonprofit organization that is working to strengthen and grow the regional food system within and around the city.

The regional cuisine is an important part of daily life and the identity of the place and people. Yet despite their deep food culture, the local food movement has been slower to take root in the New Orleans region than in many other places across the nation. When Market Umbrella opened its doors in 1995, there were no farmers markets in New Orleans, and it was difficult to find locally grown, traditional foods in the city.

"You have to get rural places making money to get the economy up and running," says a Mississippi vegetable farmer and vendor at Market Umbrella's Crescent City Farmers Markets.

This observation is especially resonant in the region explored in this case study—Louisiana, Mississippi, and Alabama—where these largely rural states and have some of the highest poverty rates in the U.S.

Today, Market Umbrella and its Crescent City Farmers Markets are part of a food system that is expanding and improving all the time. They address multiple challenges to the local food movement in their region by encouraging rural-urban relationships that bridge divides across geography, racial lines, and economic class. On a national scale, Market Umbrella is developing practical ways for local food systems of all sizes to quantify local food's impacts on regional economies and people.

Like all regional issues, some of the challenges are place-specific—like the impact of Hurricane Katrina. The story of people coming together to address economic, social, and environmental issues through food is one that applies in many contexts, however. We find that many of the lessons of Market Umbrella and the New Orleans local food movement are applicable to other regions of the U.S. with nascent or emerging food systems.

[5] See the "Wealth Creation in Rural Communities" project: www.creatingruralwealth.org

3.2 The National Picture

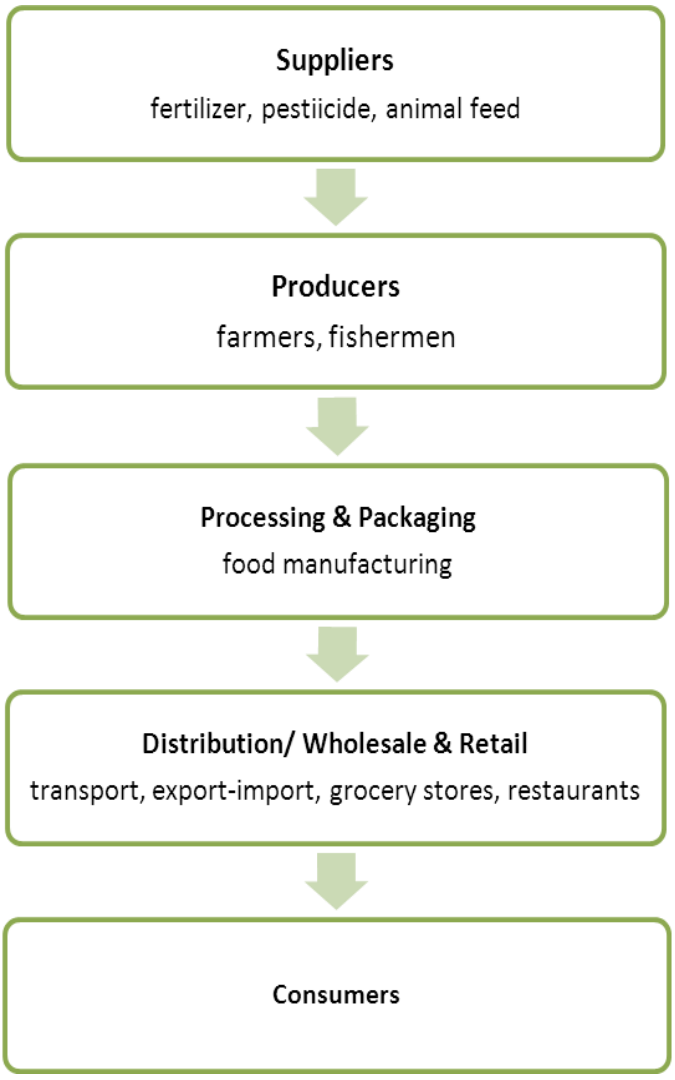
Characteristics of the food system

Food is a major player in the U.S. and global economy. The U.S. produces nearly $300 billion worth of agricultural products per year, and Americans typically spend around $1 trillion dollars per year on food (USDA, 2007; USDA, 2009). Additionally, many people in the U.S. are employed by the food system.

According to the U.S. Bureau of Labor Statistics[6], in 2008:

- 2 million Americans were employed in agriculture,
- 1.5 million in food manufacturing,
- 2.5 million in grocery stores, and
- 9.6 million in food services and drinking places.

Figure 14: Simplified Food System Supply Chain



Beyond its economic impact, the food system also affects our environment, society, and health. Food production has major impacts on our land, water, and air. The distribution of food can cause social inequalities such as food deserts and higher levels of food insecurity among certain groups. The way we process and consume food has direct implications for our health and environment, and can also affect our sense of community. The decisions we make along each step of the food system supply chain (see Figure 2) can have both positive and negative effects for individuals and communities.

Of course, the system represented in Figure 14 is far more complex than this linear graphic illustrates. Each step of the process is influenced by its enabling environment, and by the presence (or lack) of physical infrastructure, policies, government regulations, business supports, and relationships among the participants along the chain. The supply chain depicted here may look different for specific food industries or at various geographic scales (e.g., local, national, or global).

[6] See http://www.bls.gov/oco/cg/cgi_index.htm.

For our purposes, the basic chain offers a graphical illustration of how the food system links rural communities—our food production and processing hubs—with urban markets. It also provides a basis for thinking about the differences between a "traditional" food supply chain and a "value" chain. The Agriculture of the Middle website[7] explores how goals can be different along each step of the chain, and within the relationships that make up the chain (Figure 15)

> Traditional food supply chains can handle both undifferentiated (commodity) and "value added" food products. Food value chains are distinguished from traditional food supply chains by the combination of how they operate as strategic partnerships (business relationships), and how they differentiate their products (focused on food quality & functionality and on environmental & social attributes).

Figure 15: Differences between "traditional" food supply chains and food "value" chains (adapted from the Agriculture of the Middle website)

Traditional food supply chains		Food value chains
Farmers/ranchers/fishers) are treated as interchangeable (and exploitable) input suppliers, often operating in restricted markets or under short-term contracts where risks are usually born by producers.	**Participants**	As producers of differentiated food products, farmers/ranchers (and fishers) are treated as "strategic partners" with rights and responsibilities related to value chain information, risk-taking, governance, and decision-making.
Often framed in win-lose terms. Constructed as competitive, even adversarial, whereby each company seeks to buy as cheaply and to sell as expensively as possible.	**Business relationships**	Framed in win-win terms, and constructed on collaborative principles that feature high levels of inter-organizational trust.
Benefits/profits from the selling of final food products are unevenly distributed across the supply chain, with food processors and marketers usually receiving a disproportionately higher share.	**Distribution of risk & reward**	Commitments are made to the welfare of all strategic partners in a value chain, including fair profit margins, fair wages, and business agreements of appropriate duration.
Increasingly coordinated on a national & international scale. Food production, processing, and marketing sited for short-term economic gains for those parties who dominate the chain.	**Scale**	Operations can be effectively located and coordinated at local, regional, national, and international scales.

[7] From http://www.agofthemiddle.org/papers/valuechain.pdf.

The food system in the U.S. has undergone major changes in the past several decades. The next sub-sections explore some of these structural changes including increases in consolidation and vertical integration.

Ownership along the food chain

Increased consolidation among agricultural producers and processors mean that fewer firms control more of the production of our food. At the farm level, "large-scale family farms [and] nonfamily farms made up only 12 percent of U.S. farms in 2007 but accounted for 84 percent of the value of U.S. production" (Hoppe & Banker, 2010, p.iv). Among food processors, the consolidation is equally pronounced. For example, only four companies own 64 percent of the pork-packing industry, and 83 percent of the beef-packing industry (Hendrickson & Heffernan, 2005).

On the other hand, 63 percent of U.S. farmland is controlled by small family farms, or those with annual sales of less than $250,000 (USDA, 2007). The practices of small farms can thus have a large effect on our environment.

The food system in the U.S. is also characterized by *increasing vertical integration*, where a single or several cooperating firms control multiple steps along the food production supply chain. Examples of vertical integration include farmers who collectively own their input supply, marketing, or processing cooperatives, or a private firm such as a citrus producer that owns both the orange groves and processing plant (MacDonald & Korb, 2008). Decision making about farming and food processing is consolidated into fewer hands, and the profits earned along the value chain are concentrated there, too.

These phenomena squeeze small farmers out of the national and global food market, contributing to the loss of farmers in the U.S. workforce. Yet local food and direct-to-consumer sales offer alternative markets to small producers.

Rise in popularity of local food

Overall, local and regional food systems make up a small but growing part of our total food system. In 2007, the USDA measured $1.2 billion in direct-to-consumer sales, which were growing twice as fast as total agricultural sales. The growth was three times faster in the Far West and Rocky Mountain regions, and four times as fast in the top ten farmers' market states (Tropp, 2010). In this report, local and regional food systems are defined by direct sales between farmers and regional consumers, rather than wholesale or commodity sales.

Farmers markets often represent a first step for communities looking to build up their local and regional food system. Even though farmers' markets are only a small percentage of total agricultural sales in the U.S., they are by far one of the fastest growing segments. In 2011, there were 7,175 farmers markets across the U.S., compared to less than 2,000 in 1994 (Tropp, 2010).

A paper by the RUPRI Rural Futures Lab (Jensen, 2010) notes the diverse reasons that communities are supporting efforts to grow the local food movement:

> *Food is a "shared cultural emblem" that has the capacity to unite the region.*
>
> -Richard McCarthy
> Market Umbrella

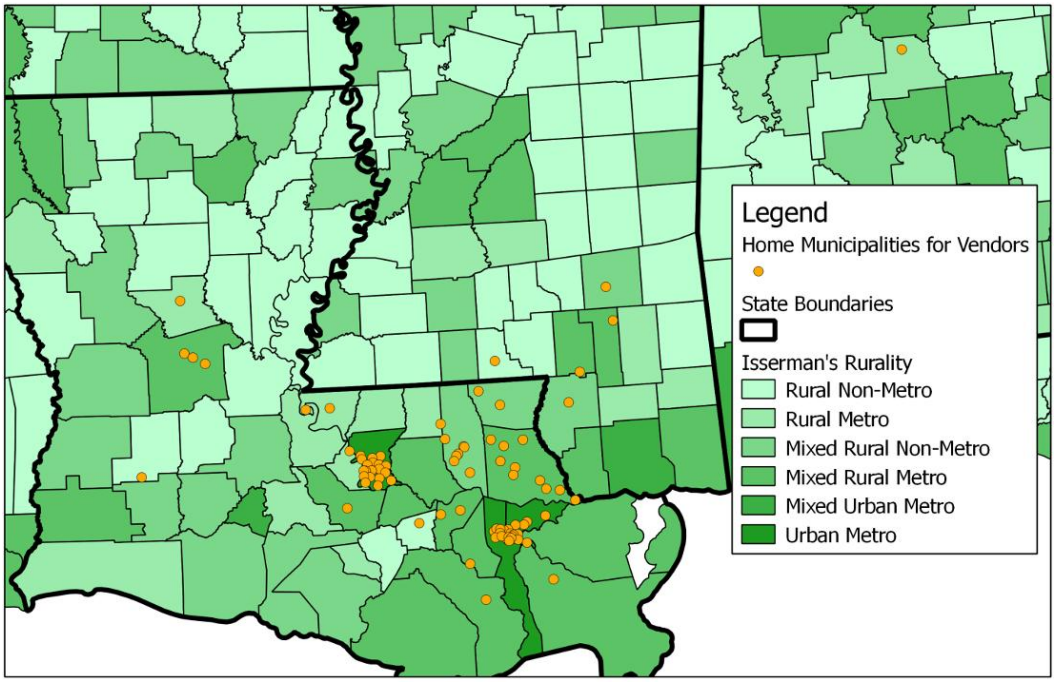
- To generate *economic development* in their communities by encouraging "buy local" campaigns and promoting local and regional entrepreneurship.
- To connect local food with social justice issues and better public health outcomes related to *food security*.
- To address *food safety* problems associated with the spread of disease through large-scale agricultural production by using the shorter supply chains of regional production systems.
- To pursue *environmental sustainability* through their local food systems, which consumers perceive to be more likely to embrace organic or other sustainable methods.
- To build more *sense of community* by inviting social interaction around local farm markets and community decision making.

Each of the reasons named above represent different aspects of community wealth that communities are addressing through regional food systems.

3.3 The New Orleans Regional Food System

For the purposes of this case study, Alabama, Mississippi, and Louisiana make up the region under discussion. This area around New Orleans is known for its unique food culture. Dishes like jambalaya, red beans and rice, and beignets are easily identified with Creole cuisine. The local fare and vibrant

Map 3: Location of Market Umbrella Vendors on Rural-Urban Continuum



tourism industry has encouraged a lively and creative restaurant scene in the city. In addition, the region outside of New Orleans is largely rural and agricultural.

As shown in Map 3, the Market Umbrella vendors are spread out in a variety of counties ranging from rural non-metro to urban metro in areas that are farmland, bayous, and grazing land. All of these characteristics support the development of a regional food system.

Yet despite the advantages of a thriving food culture and strong rural and agricultural roots, the New Orleans regional food system is still an emerging model. Across the U.S., there are examples of more and less mature local food systems (see Table 6).

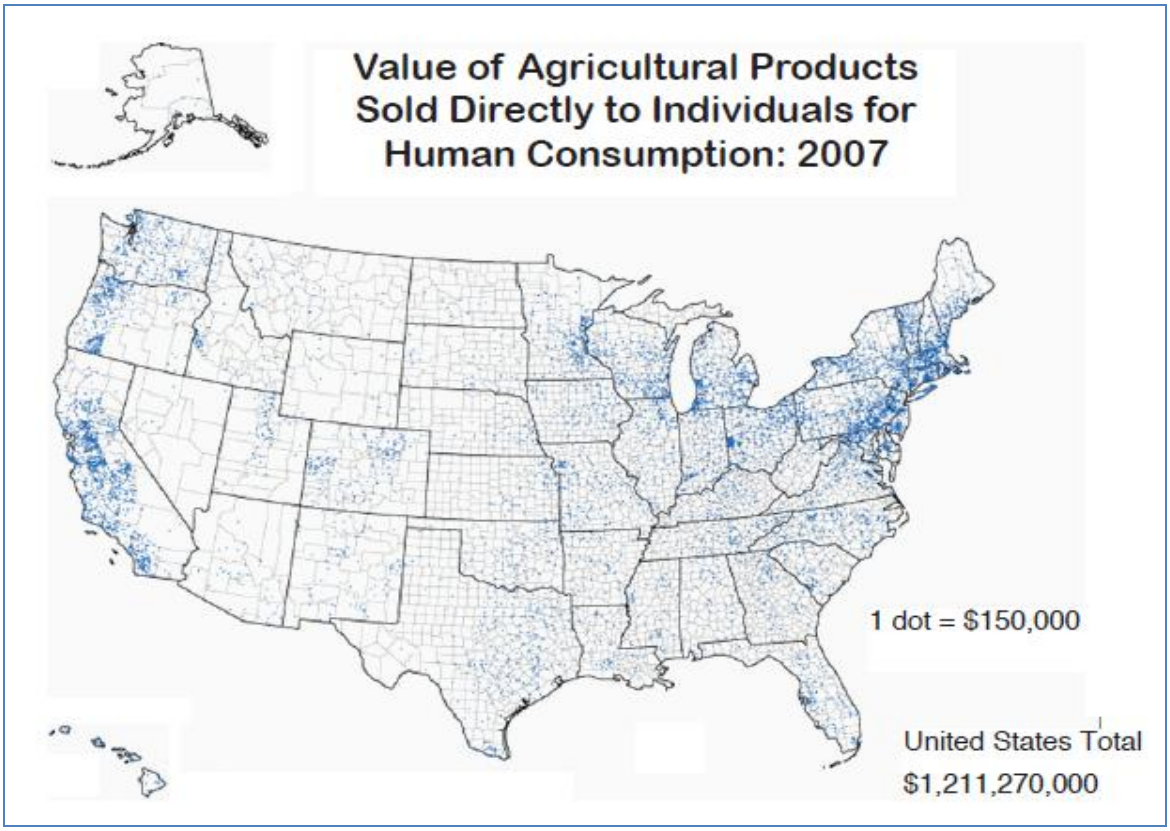
Table 6: Examples of Direct Food Distribution Models by Stages of Development[8]

Distribution Model	Start-up / Nascent	Developing / Emerging	Mature / Developed
Retail driven		La Montanita Food Cooperative, NM	The Wedge/Coop Partners, MN
Non-profit driven	MFA/Big River Foods, MN	**Market Umbrella & Crescent City Farmers Markets, LA** CAFF/Growers Collaborative, CA	Red Tomato, MA Appalachian Sustainable Development, VA
Producer driven	Browse and Grass Farmers Association, WI		New North Florida Cooperative, FL
Consumer driven		Oklahoma Food Cooperative, OK	

In fact, according to a common measure of local food systems—agricultural products sold directly to consumers—the New Orleans region is following the slow development patterns of several major U.S. regions. Map 4 shows that New England, the Mid-Atlantic, the upper Midwest, and the West Coast have the strongest local food economies by this measure. The southern and western U.S. regions show less engagement in direct-to-consumer sales, indicating that there are large areas of the country with fairly undeveloped local and regional food systems, and that there is still room for growth in regions like New Orleans.

[8] Based on Tropp, 2010, p.26

Map 4: Value of Direct-to-Consumer Agricultural Products
Source: USDA 2007 Agriculture Census fact sheet: Agricultural Diversification[9]



Some reasons for the slow development of the region's food system include socio-economic challenges and weak local policies to support a regional food system. In addition, the region is still recovering from a major natural disaster—Hurricane Katrina—that has hindered development projects of all kinds.

Regional Socio-Economic Challenges

The region is marked with high poverty rates and high unemployment. There is an acute need for economic and community development in both the city of New Orleans and in the rural places surrounding it.

Race issues are relevant to the everyday functioning of the food system here, since Mississippi, Louisiana, and Alabama boast the highest percentages of African Americans in their state populations (U.S. Census Bureau). African American land loss is a major issue for farmers in the region, according to the Executive Director of Market Umbrella.

[9] http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Fact_Sheets/agricultural_diversification.pdf

Race and the Food System

Who has access to land and seed? (The majority of black farmers are small operators who can't afford to buy seed.)

Who receives the government subsidies? (90 percent of USDA subsidies go to commodity crops, and only 7 percent of black farmers grow commodity crops.)

Who experiences the environmental impacts of food distribution? (Similar to the way interstate highway systems and chemical plants are built in low-income black communities, so are food distribution centers. Large delivery trucks come regularly and idle, releasing harmful diesel particulate, an asthma trigger.)

Which communities have better supermarket access? In which communities are garbage transfer stations often located? The answers to each of these questions will inevitably point to a racist system.

Jenga Mwendo
Director of the New Orleans Backyard Food Network
Food Fellow with the Institute for Agriculture and Trade Policy (IATP)
(http://foodandcommunityfellows.org/digest/article/racism-food-policy-new-orleans)

Local Policies & Agencies

In New Orleans, there is scant support to develop public markets. When the Crescent City Farmers Market opened in 1995, they were the only first farmers market to open in the city in a century. The market organizers quickly learned why: the city's public health department did not allow organizations to sell fresh food at public events. By working with the mayor's office, Market Umbrella was able to operate under a "festival exemption". Seventeen years later, they still depend on the exemption.

Relations between the farm market community and the state and local government appear to have ups and downs. In interviews for this case study, we found a disconnect between market participants and the state regarding the availability of agricultural and small business services. While the market organizers and vendors say the state does not help small farmers very much, the Louisiana Department of Agriculture and Forestry says that they will give guidance to anyone who calls. However, Market Umbrella organizers were clear that relations with the state have improved since the election of a new Commissioner of Agriculture in 2007.

The local agricultural extension agencies were cited in several interviews as limited partners to the local food movement. Relationships with extension agents seem to be most useful for making connections across the food system. Today, the producers who come to the Crescent City farmers markets are often referred to the market by extension agents or other producers. However, we found anecdotal evidence that extension agencies have limited experience with sustainable agricultural practices and cannot provide technical help on organic growing practices. For example, one farmer who went to the Louisiana State University's extension service with a question about growing organic citrus was told that he knew more about the subject than they did.

On the other hand, Market Umbrella's Executive Director, Richard McCarthy notes that regional fishers enjoy a strong relationship with a particularly helpful group, the Sea Grant extension agents[10]. McCarthy says,

> The public nature of commercial fishing means that fishers rely heavily upon Sea Grant agents' knowledge to conduct their business. An example is the ship-to-shore conversations between fishers and agents when a fisher is uncertain as to the legality of fishing in particular waters. This close and frequent communications leads to a different relationship than what is enjoyed between industrial agriculture agents of land grant [universities] and small farmers.

Recovering From Disaster: Hurricane Katrina

Hurricane Katrina disrupted life in the region at all levels, and its influence has impacted how the region's food system has developed. After the hurricane, local people that remained in New Orleans focused on fulfilling their basic needs: shelter, food, water, and finding loved ones.

Sources of food at that time were so scarce that some people depended on military MREs (meals ready-to-eat), according to one woman (Mother Nature Network, 2009). Even months after the storm, the few residents of the decimated city were depending on emergency food. Most neighborhoods did not have functioning grocery stores, food production and distribution systems were disrupted, and the population had fallen to the point where it was difficult to find workers for the few stores that did open (Farm Aid blog, 2006). Local farmers lost crops and equipment to the storm (see text box), and many people left the area during the evacuation and did not return for months, if at all (Seattle Tall Poppy blog, 2010).

Hurricane Katrina and local farms

Hurricane Katrina did significant damage to one Crescent City dairy farmer's equipment. After the hurricane, the dairy producer sold her herd for two years and considered permanently abandoning a family business that had lasted 30 years. With encouragement from Market Umbrella, the dairy farmer bought a small herd to rebuild her business in June 2010.

Part of the help that Market Umbrella provided was in the form of business support. Market Umbrella helped the farmer fill out application forms for a grant from the John Besh Foundation. The dairy farmer won a grant, ensuring they had the funds to get back in business so that they could continue to sell their goods to the people of the gulf coast region.

Organizations that had formerly focused on the local food system responded to the new needs of the city:

- Market Umbrella was well established enough by the time Katrina hit that they had reopened one of the Crescent City farmers markets within 10 weeks of the storm. Their market represented one of the few sources of *any* fresh food, let alone locally grown food, that was available in the city at that time.

[10] http://www.laseagrant.org/

- The nonprofit New Orleans Food & Farm Network (NOFFN), founded in 2002, shifted its mission to rebuilding the food system after Hurricane Katrina. To help residents find healthy food in the city, NOFFN built practical maps of food sources and distributed them widely. Today they continue to focus on helping consumers gain access to local foods.

Since Hurricane Katrina, a few organizations have joined the movement to strengthen different aspects of the New Orleans food system. McCarthy has watched some organizations rise and fall, while others have risen and persevered. Most of the growth has been among urban food efforts. Some examples of ongoing efforts since Katrina include:

- The New Orleans Food Policy Advisory Council, recognized by the city in 2007, works to increase consumer access to healthy and fresh foods.
- Edible Schoolyard New Orleans operates at five charter schools operated by the First Line charter school network.
- Many small nonprofit organizations are leading volunteer efforts in urban agriculture (e.g., the Latino Farmers' Cooperative and Grow Dat Urban Farm).
- Hollygrove Farm and Market is a CSA-style fresh food enterprise associated with an urban community development corporation (CDC).
- For-profit companies offer regional food to local buyers (e.g., Jack and Jakes, a wholesaler).
- Local foundations are providing grants to help farmers and entrepreneurs get back on their feet after Hurricane Katrina. For example, a local chef started the John Besh Foundation, which has supported local farmers and other entrepreneurs since 2011.

3.4 Building and Measuring a Regional Food System

In response to the challenges and opportunities of the New Orleans regional food system, Richard McCarthy, Sharon Litwin, and John Abajian developed Market Umbrella and the Crescent City Farmers Markets. The founders' overarching goal was larger than managing farmers markets, however. They sought to build a sustainable regional economy that united both rural and urban areas:

> Formerly known as the Economics Institute, marketumbrella.org began with a simple mission: to promote ecologically sound economic development in the Greater New Orleans area, particularly among family farmers and other local agricultural enterprises.[11]

To work toward their vision Market Umbrella partnered with Loyola University's Twomey Center for Social Justice. The market separated from Loyola and became an independent nonprofit organization in the spring of 2008.

Today, Market Umbrella operates on multiple scales. Locally and regionally, they run the three weekly Crescent City Farmers Markets (see text box below), which focus on building relationships between urban consumers and rural producers.

From http://www.marketumbrella.org/index.php?page=loyola-university

The Crescent City Farmers Market

In 1995, only six producers sold their goods at the first Crescent City Farmers Market in a lot in New Orleans' Warehouse district. Today, Market Umbrella manages three weekly markets that operate 50 or 51 weeks a year (details from Market Umbrella, 2011):

- *Crescent City-Mid City*: 3-7 PM on Thursday afternoons. In 2011, an average of 17 vendors earned an average gross receipt of $678.45 per market day. An average of 469 shoppers spent $24.62 per market. While this market does not bring a lot in cash sales, a third of the sales at this market are SNAP, meaning that this market does a good job of reaching out to low-income residents.

- *Crescent City-Uptown*: 9 AM-1 PM on Tuesday mornings. This market operates near the Market Umbrella offices, and appeals more to professionals, retirees, and school and senior groups. The average number of vendors is 23 who earn on average $1,457.23 per market. The average number of shoppers is 1,170 who spend $28.62 each.

- The flagship *Crescent City market* still operates Saturday mornings in the Warehouse district. This market appeals to tourists, families, and locals in the area. An average of 26 vendors earns $1,574.80 each, and an average of 1,300 shoppers spends $31.50 each.

For consumers, the organization maintains a SNAP/cash matching incentive program to encourage low-income residents to participate in the local markets. Market Umbrella has also developed an alternative currency for consumers to use at the Crescent City markets. Many consumers prefer to use credit cards, but individual market vendors usually do not offer that service. In response, Market Umbrella introduced a "wooden currency" in 2005. Using their SNAP cards or credit/debit cards, market shoppers can purchase the alternative currency to pay for their farm market goods. The vendors get the coins reimbursed on a bi-monthly basis for cash.

The Crescent City wooden currency (pictured at right) now accounts for 10 percent of the markets' sales. They expect to reach $400,000 in wooden currency sales by the end of 2011 (Van Hook, 2011). This innovation has made the point of sale significantly easier to navigate for both the vendors and consumers. For example, as opposed to getting a receipt from each vendor at the market, a restaurant shopper can purchase however much they want to spend at the market with the company credit card and have one receipt, making

accounting significantly easier.

Market Umbrella also provides business services to regional entrepreneurs and community members. The nonprofit helps market vendors write and submit grant proposals for business development, and introduces them to chefs or organizations that might be interested in their goods.

Market Umbrella offers micro-grants to entrepreneurs and community groups through the Crescent Fund. When market consumers purchase wooden coins, they have the option of putting one dollar into the Crescent Fund. Community members and groups can submit applications for a $500 cash infusion for that is either for public market development or for a project that is aligned with the values of the public market (such as improving a neighborhood garden). The Crescent City Farmers Market community—shoppers and vendors—then vote on the projects to decide who receives the funds. Those who receive the money must pay back the funds through their "time, talent, or treasure." For instance, a woman who was trying to start her own bakery paid back her cash infusion by baking cakes for a Market Umbrella event, according to McCarthy. Other projects that have been funded include school gardening and cooking initiatives, a New Orleans bicycle map project, and a farm that needed money to help remove debris from their farm after a major storm.

On a national scale, Market Umbrella functions as an educational and grant-making organization that supports other public markets. Market Umbrella manages *Marketshare*, a networking site for public market organizers to share their experiences and data (explained more fully in the next section). Their educational outreach also expands globally, with international speaking engagements and internships.

Market Umbrella Tools

Market Umbrella does not just run farmers markets, but also studies them. To conduct their research, they are developing survey tools and a national and international network of public market practitioners:

> By learning, sharing and growing, we cultivate the field of public markets for public good. We develop tools that help other markets build capacity and evaluate impact, stage peer learning opportunities, and launch a number of innovative programs to grow agricultural enterprises. Our reach now extends well beyond the New Orleans area, but our commitment to innovation and the economy of place — and of course, eating well — is still what drives us.[12]

Marketshare is an online forum[13] that Market Umbrella has developed to bring the people who run public markets together to share data and ideas (see Figure 16). Marketshare has over 900 members, 65 percent of which are market organizations. Other members include local governments, universities, Main Street associations, individuals (like farmers), journalists, and consultants.

[12] From http://www.marketumbrella.org/index.php?page=loyola-university
[13] See http://www.marketumbrella.org/marketshare/.

Figure 16: Marketshare online resources

The *Sticky Economic Evaluation Device (SEED)* is a survey instrument that helps market organizers to determine the economic effects their markets have on the local community and market vendors. It is available to people who sign up for Marketshare. Through SEED, Market Umbrella offers detailed instructions on how to complete a full market study. SEED uses basic data about the market, such as how often it runs, what it sells, how big of an area the market occupies, who owns the space, how many vendors, etc. It includes a survey designed for interviewing market customers, and describes how to accurately count the number of customers who enter the market. The resulting SEED report provides data on the average number of customers, the average amount spent by customers, the average amount taken in by vendors, the amount taken in by square foot of space, and where the customers are from. The reports can be used to help market managers solicit investments.

The *Neighborhood Exchange Evaluation Device (NEED)* will help market managers measure the social capital that is generated at their markets between the vendors, shoppers, and community residents. Through a combination of interviews and observations of the markets and interactions at vendor stalls, NEED determines who is coming to the market and what types of relationships, if any, are being forged by the market. The data acquired analyzes the demographics of customers, how different participants typify their relationships with others at the market, why people come the market, and how long they stay there. Market Umbrella is currently in the process of developing and refining NEED, so this tool is not yet available for use on the Marketshare website.

Growing Community Wealth

This section explores several of the community capitals that have been impacted by Market Umbrella's work. Of the seven community capitals, used by the WCRC Initiative (see page 10), financial, social, individual/intellectual, and natural capital are featured here.

Financial Capital

Using the Wealth Creation and Rural Livelihoods approach, financial capital is made up of stocks, rather than flows, of financial wealth. It "may include savings that households build up over time, or an endowment created in a local community foundation. These are examples of unimpaired financial assets – ones that can be used to invest in creating new forms of wealth."[14] However, flows of financial wealth such as income and sales are more easily measured than stocks such as household savings, so flows are more often reported here.

Providing an opportunity for rural producers to turn a profit through a regional economy has been a primary goal of Market Umbrella since the beginning. One of the organization's first "green papers" explored the economic impact of the Crescent City markets on rural communities and vendors. At that time, Market Umbrella found that the combined regional economic impact of the Crescent City markets was nearly $549,000 annually for 1995 through 1998. Also, through participation in the market, 15 new businesses and 22 new jobs were created for rural communities (Market Umbrella, 1999).

Unfortunately, there have been no reports since 1999 on the effects of the market on rural communities in particular. The Crescent City markets have grown considerably since that report, which implies more financial capital for more rural communities. Two vendor interviewees noted that they intentionally purchase from locally-owned businesses, farmers' markets, and co-ops in their rural home communities. Based on this anecdotal evidence, Crescent City markets are indeed connecting rural and urban places in a regional food economy.

Saving a dairy through direct-to-consumer sales at the farmers market

One Crescent City Farmers Market vendor has been in the dairy business for approximately 30 years in Mississippi. The dairy business has been in decline for much of that time in the region and throughout the nation.

Ten years ago, the farmer and her family read about northern U.S. dairies that were experimenting with value-added products and direct-to-consumer marketing. They decided to try both strategies to save their struggling dairy farm.

The family contacted their local agricultural extension agent for ideas of where to start. The agent directed the dairy farmers to Market Umbrella and the Crescent City farmers markets. According to the farmer, her family owns the first dairy in the Mississippi/Louisiana area to pursue direct-to-consumer marketing through farmers markets.

[14] http://www.creatingruralwealth.org/wealth-creation-approach/multiple-forms-of-wealth/

The organization has published its more recent financial impact on New Orleans using SEED. For 2011, the total projected gross annual receipts for all three markets were $4.3 million. Market Umbrella estimates that the total economic impact of the markets is $8.3 million (Market Umbrella, 2011), with a regional multiplier of 1.91. That means that for every dollar spent at the Crescent City markets, $1.91 is generated in the local economy.

The average gross weekly receipts for all three markets per is $34,225. On average, vendors take home $1,301 per market. If they were to attend one market per week for all 51 weeks that the market is open, they would bring home over $66,000. This figure could increase or decrease depending on which market they choose to attend and is a gross. The median household income in Louisiana is $42,505 (U.S. Census Bureau). Based on these figures and personal stories like the dairy farm in the following text box (next page), Market Umbrella's farmers markets are helping regional producers support themselves and participate in the regional food economy.

There is a common thread among the stories of the Crescent City market vendors: they either would not be in business today or they would not be as successful if they had not participated in the urban farmers markets. This fact was emphasized by multiple producer interviewees.

Social Capital

Beyond the financial benefits, Market Umbrella's farmers markets have done a particularly good job of improving the stock of social capital across the region. According to McCarthy, the relationship between New Orleans and the surrounding rural areas was very negative and antagonistic at the time of the markets' inception. McCarthy says that local politicians were using New Orleans as a symbol for all that was wrong with the social and economic policies of the time. In addition, the city's high crime rates in 1995 meant that people outside the city—including rural producers of local foods—were frightened off from the potential markets of the city. There were few positive interactions on a regional level.

Market Umbrella's organizers first challenge was finding producers who were "brave enough" to come into the city center to sell their goods. "It was like asking the farmers to come to Baghdad," McCarthy admits. Luckily, some of the regional farmers realized that there was profit to be made by growing niche crops and providing fresh, local produce for the urban chefs that were gaining national prestige.

Examples of social capital at work among Crescent City farmers markets' consumers and vendors include:

- When a local family dairy's processing facility exploded, an attorney who frequented the market assisted the family with completing the necessary paperwork and navigating interactions with the insurance companies and government authorities (Van Hook, 2011).
- When a market shrimper's wife was diagnosed with cancer, thousands of dollars were raised among the market shoppers and vendors alike to help cover the costs (Van Hook, 2011).

Much of the social capital that has been accrued by the participants in the market—rural vendors or urban consumers—has developed by crossing over racial and economic boundaries. The Crescent City farmers markets are doing a relatively good job of reaching low-income residents, which a challenge for many farmers markets. In some circles, farmers markets and local food are seen as elitist or expensive, yet one-third of Market Umbrella's Mid-City market sales receipts come from low-income SNAP participants. Market Umbrella organizers see room for improvement in diversifying the demographics of the vendors at the Crescent City markets (Carter, 2011).

Diverse participation in the regional food system

In 1964, a group of Mississippi farmers—seven black and one white—founded an association to make themselves eligible for grants from the Office of Equal Opportunity. Their goal was simple: to buy a sprayer for their crops.

More than a decade later, the farmers discovered that African American farmers in the organization were getting paid less than the white farmers for the same goods from certain major buyers. In response, the association purchased a truck in 1979 and started selling their goods directly to certain buyers who offered fair prices for all.

The association has continued to thrive, and became a formal cooperative in 1981. Today, the cooperative has 35 participating members and 10 non-participating members. They built their own packaging facility in 1996, which was used as a warehouse for relief items after Hurricane Katrina.

The cooperative has been a partner of Market Umbrella from the beginning. The cooperative's current Director is credited with being a co-founder of the Crescent City farmers market, and the cooperative was one of the first six vendors to participate. They were also present at the first market to open after Hurricane Katrina.

According to two Market Umbrella employees, the breakdown of stereotypes occurred faster after Hurricane Katrina. There was a "reordering of the power structure", and because of the "shared sense of trauma," it was much easier to do work regionally across political, racial, and class barriers. More neighborhoods were cohering in new ways because it became clear after the hurricane that the government could not necessarily be trusted to help them if they needed, so they had to help each other.

A NEED survey in 2007 found that farmers market vendors, consumers, and New Orleans residents alike saw farmers markets as being important for community life not only for the nutritional aspects but also as an access point to local farmers and a social meeting place. Shoppers interviewed said that the markets were even more important post-Katrina because they promoted social cohesion.

However, the social cohesion encouraged by farmers markets has limits. It may only exist in neighborhoods where there was some degree of social cohesion before, or only among homogenous groups. Another NEED survey of one market in the low-income area of the Upper Ninth Ward found low turnout and participation by vendors. At the Crescent City farmers markets included in the sample, 80-90 percent of the shoppers were white, and most were white-collar professionals or able-bodied retirees.

Individual/Intellectual Capital
For many small producers, farmers markets serve as a valuable first step in running their own business. For example,

- The Crescent City wooden currency develops the vendors' financial literacy. The wooden currency is reimbursed twice monthly, which requires a different management strategy from cash, and more involvement in the formal economy.
- Through interaction with consumers, vendors at the markets are learning how to cater their businesses to provide better services and products. McCarthy notes that some female vendors are becoming especially adept at being responsive to customers by offering smaller sized ready-to-eat food products.

Farmer vendors are also expanding their agricultural skills by catering to the needs of restaurant customers. Chefs ask for access to new kinds of crops, and some farmers will grow these niche products for them. Once the new crops make it to the market, vendors and customers inquire as to how to prepare them, and some chefs even make recipe cards for vendors to distribute at their stall (Van Hook, 2011).

The skills cultivated at and for the Crescent City markets are transferable to other jobs and industries. McCarthy tells the story of one vendor who taught himself how to process strawberries for wine to sell at the market, and now he processes strawberries for Abita Beer's Strawberry Harvest Lager and a regional dairy's strawberry ice cream. This entrepreneur has developed a new stock of individual capital that can be taken anywhere.

Intellectual capital is developed when Crescent City market vendors bring their new skills back to their home communities. Some vendors participate in and help organize farmers markets in rural towns. Others spread knowledge about sustainable production practices that was previously unavailable. Producers have had to figure out many of these techniques on their own through experimentation. There is anecdotal evidence that some of that hard-earned knowledge is transferred from one party to another while selling goods at the market (McCarthy, 2011; Van Hook, 2011).

Natural Capital
While Market Umbrella was founded with the intention of promoting ecologically sound economic development, there are no codified standards of environmental sustainability for the producers that sell goods at their farmers markets. At this time, Market Umbrella has no way to measure environmentally focused changes in the region as a result of their markets.

Many of the producers at Crescent City farmers markets rely on conventional agricultural methods. One grower stated that, while trying to use organic methods as much as possible, he is not going to lose a whole crop to pests or disease if he can use a conventional chemical pesticide. For most small farmers in the region, the risks for going officially organic are higher than the potential rewards.

Market Umbrella organizers recognize that a blanket requirement for all of their vendors to have organic certification would leave the market with few or no vendors. The process of becoming a certified organic is often time and cost-prohibitive. A dairy farmer selling at the Crescent City market noted that she would have to buy organic cattle feed from Missouri, which would raise her costs to the point that her business would no longer be competitive. It often takes three years or more for producers to go through

the organic certification process, during which time they cannot sell their products under an organic label.

There is little support from agricultural extension agencies toward pursing an organic label. As of February 2012, McCarthy says there is no staff among the Louisiana Extension or Department of Agriculture that can administer an organic system. Technical assistance for organic practices is virtually nonexistent. One citrus grower using organic growing practices was told by the local extension office that the grower knew more about organic fruit production than they did.

Yet when consumers ask for organic or sustainably produced goods, market vendors are encouraged to use organic practices. At the Crescent City farmers markets, many of the vendors claim to use sustainable practices in their business. Among the personal relationships that vendors create with consumers at the market, their word is sufficient.

The learning process is slow, but McCarthy sees positive changes. He provides an anecdote about a small-scale poultry producer who has recently started using no-till practices with organic inputs. The farmer told McCarthy, "I've never been a huge organic believer, but I'm now understanding how we need to get back to basics with building soils and addressing the health effects from all of these chemicals we've been using."

3.5 The Rural-Urban Dimension

Food systems of all scales have a rural-urban dimension: in general, food is produced (and often processed) in rural places, and consumed in urban ones where most of the population resides. Yet not all food chains are place-based, meaning that the participants along the chain may not be co-located or geographically linked in any meaningful way. The 2010 Rural Futures Lab paper (Jensen, 2010) discusses this distinction in the varying definitions of different scales of food systems:

- A *local food system* comprises the actors and process of growing and processing food near its end market, the consumer. Most people agree that "local" is defined by geographic proximity. Some researchers say "local" food can [also] be identified by certain types of market arrangements that connect farmers directly or nearly directly to consumers (Martinez et al., 2010).

- *Larger scale food systems*, like the national food system, operate at a scale that is not place-based. The terms "agro-industrial" or "conventional" food systems generally refer to the methods used in agricultural production and processing. These terms often assume high-efficiency, large-scale production based on the industrial principles of economies of scale, narrow diversity of crops, and a scientific approach to nutrition and food processing (Hanson & Hendrickson, 2009).

- Some authors differentiate *regional food systems* from local systems to emphasize the need for local foods to scale up to be sustainable or self-reliant. Regions are described as having a wider land base, more varied food products, and larger markets than local systems (Clancy & Ruhf, 2010). Advocates emphasize that regions are a good unit of analysis for measuring land use needs and priorities because agricultural issues are

regional issues: “topography, water availability, land and other inputs, farm scale, crop options, and market proximity are operable at the regional level” (ibid.).

- Regional food systems advocates argue that “local is a necessary but not sufficient component” (ibid.) of a self-reliant food system. They envision regions as made up of multiple local systems. In practice, regions can be a larger partner to local systems, offering opportunities to scale up and diversify local production. The diversity and redundancy of multiple “nested” food system scales may bring more resilience to our food system as a whole.

For rural America in particular, the regional approach may benefit remote communities by connecting them to local food systems that would have otherwise existed apart from them. This hypothesis appears to be true for the New Orleans regional food system associated with Market Umbrella and the Crescent City farmers markets.

Linkages Back to Rural Communities

Producers for the Crescent City farmers markets come from Louisiana, Mississippi, and Alabama (see map in Figure 4 on page 57). They are vegetable farmers, fishers, dairy farmers, beekeepers, and more. The average distance a producer has to travel to the Crescent City markets is 72 miles, but some producers come from as far away as Jemison, Alabama, which is approximately 350 miles (Crescent City Farmers Market, 2011). The anecdotes shared in this case study demonstrate that without the relationships developed through the Crescent City markets, these more remote rural producers would not have access to the urban markets of New Orleans.

In addition, once the vendors’ home communities find out that a producer is going to New Orleans to sell at a farmers market, there is interest sparked in the home community to set one up as well. Crescent City vendors attending the new farmers’ markets can use their experience at the New Orleans markets to assist the development of the rural markets. McCarthy estimates that at least half of the rural vendors who sell at Crescent City markets also attend other farmers markets, and at least half of those other markets are in rural areas. According to the USDA’s Food Environment Atlas, eight of Louisiana’s farmers markets are now in the hometowns of Crescent City vendors. Farmers’ markets in these rural towns are thus bringing more financial and intellectual capital into the rural region around New Orleans.

Linkages to the Urban Market

The consumers represent the end market as well as the urban dimension of this rural-urban relationship. The consumers at the Crescent City farmers markets generally fall into two categories:

individual consumers shopping for their personal use, and institutional consumers shopping for restaurants or schools. A majority of individual consumers are urban residents of New Orleans, with only small percentages coming from the suburbs of Kenner or Metairie (Market Umbrella, 2011). These consumers tend to spend relatively small amounts at the market.

Institutional consumers, particularly local chefs, are important to the history, management, and continued financial success of the Crescent City farmers markets. As noted earlier, when the restaurant scene was blossoming in the 1980's and 1990's, many of chefs had nowhere to go to buy locally grown products. Crescent City farmers markets were the first to fill that niche in 1995, and Market Umbrella has successfully worked to make connections between restaurant shoppers and vendors. Representatives of the restaurant industry have a say in how the market is run, with some seats on the board of directors reserved for chefs and other members of the restaurant industry.

> One New Orleans chef cited the Crescent City markets as the best option in the city for local food, and said that having a relationship with the producers is important to their restaurant and their customers.
>
> A forager for one of the restaurant groups in the city stated that the freshest food comes from nearby and can be acquired at these markets, and it is the freshest food that chefs want associated with their restaurants.

While the restaurant-producer business relationships begin at the market, they often grow and deepen beyond a weekly market interaction. Often restaurant shoppers will ask for specific products or for products to be grown in a certain way. For instance, one producer started feeding whey to suckling piglets at the request of a restaurant group. McCarthy spoke of chefs and farmers "planning their businesses together" by going through seed catalogs and picking out products for the producer to grow and the chefs to buy together. Because of these dealings, the selection of products offered at the market has diversified considerably (Van Hook, 2011), and the market vendors have expanded their knowledge and capacity for producing more diverse goods.

Rural producers also use the Crescent City farmers markets are also a place to test new products and connect to new urban buyers. One dairy producer used the Crescent City market to determine whether or not there is was demand for Creole cream cheese, a regional dish that had not been available commercially in the greater New Orleans area for 20 years. After Market Umbrella started advertising that Creole cream cheese was available at the Crescent City markets, 26 grocery stores approached the dairy producer to buy her product.

Horizontal Linkages across the Farmers Markets

Business relationships between vendors at the market can be competitive or collaborative. Some competition between vendors is good, but if there is the threat of it becoming a disruptive force at the market, market organizers have to "act strategically so as to not upset the trust between the market and the farmers" (Van Hook 2011).

Crescent City organizers balance their markets in several ways. First, they choose vendors and the markets certain vendors can attend. In addition, to avoid having a surplus of one product while there is dearth of others at the weekly markets, the Crescent City organizers have some say in who is allowed to sell what at the markets. While the market organizers believe that choice is good for the consumers and competition is good for the vendors, they do not want to let their markets get so flooded with one product that producers are not able to make a profit. In theory, if the demand for one product increases, the organizers will allow more vendors into the market.

While some of the vendors at the Crescent City farmers markets view their relationship with others at the market as competitive, there is also a considerable amount of collaboration between vendors at the market. Some of the vendors buy supplies in bulk to cut down on shipping costs, such as one farmer who organizes bulk shipments of Agrande kelp, a fertilizing product used by organic producers. Other informal, mutually beneficial arrangements include a farmer who grows starter plants for other vendors.

The Enabling Environment

An important part of any value chain is the environment in which it operates, made up of a system of support structures around the chain that help it function. These structures include the policies and regulations that affect individual businesses and their interactions as well as the business enabling environment.

Business Support

The business support that Market Umbrella provides the vendors in its markets is vital to the success of both the regional food system and the participants themselves. One fish producer said that Market Umbrella provides a majority of the business support that her small company receives. She noted that Market Umbrella had referred her company to potential buyers such as chefs and grocery stores, and connected her to film crews for producing advertisements. Market Umbrella also helped her fill out the paperwork that won her company a grant from a local celebrity chef's foundation that has a program geared towards small farmers.

Serving as a connector of people was even more vital in the time after Katrina. McCarthy remembers,

> "…if you were in rural areas, you were isolated, you cut off from resources reaching you. And the rural farmers' connection to the city ended up being one of their assets because we used the market post-Katrina as a place where we could introduce nonprofits, people, farmers to foundations, government officials, and the media."

Improving Relations with Government

Market Umbrella has worked with several local and state governments to improve the enabling environment for the food system. The New Orleans mayor's office has been very supportive of Market Umbrella and allows their farmers markets to operate under a festival exemption in the city. At the state level, Market Umbrella has continued to work with the health department to meet their guidelines to operate legitimately under that code. Yet the nonprofit's organizers have found a significant number of discrepancies between the city and state regulations as well as fire and health codes.

In response, Market Umbrella recently applied for and received a grant to work with the mayor's office to align the multiple layers of codes and regulations so that none of the rules contradict each other. McCarthy says that his office has just completed a year-long policy project with the city. While the city conducted relevant research, Market Umbrella submitted zoning and permitting recommendations. McCarthy says, "We are poised for major, positive changes on this front." He also notes that the year-long engagement has "already borne results" for market vendors. The city's systems of permitting and sales tax collection are becoming more "reasonable", and vendors report to McCarthy "an improved customer service system and attitude in the Department of Permits" (personal communication, 2012).

Market Umbrella is working to improve the relationship between small farmers, the farmers markets, and the government. Market organizers continue to research ways to make the market processes easier (such as how taxes are collected) and more beneficial to the city, consumers, and the vendors.

3.6 Lessons Learned

Wealth creation is not just about money – it is about building relationships, skills, and knowledge, and protecting and improving community assets. Market Umbrella and the New Orleans regional food system have made great progress in developing the food value chain and addressing multiple social and economic challenges.

There are many regions of the country – particularly remote and rural places – that do not have well-developed (or even emerging) local food systems. There are lessons to be learned from a place like the New Orleans region, where the food system is not as well-established.

- **Measuring your food system highlights opportunities**

Executive Director Richard McCarthy reports that there is room for economic growth in the local food system, noting that he sees more consumer demand for local and regional food products than the Crescent City and other city markets can provide. McCarthy can confidently report this opportunity because his organization has taken the time and resources to measure their food system. Across the U.S., there is a trend toward mapping and measuring food systems to find sources and demand for local markets. Market Umbrella's SEED survey offers a practical and transferable tool for existing and potential local food systems across the U.S.

Taking the mapping trend one step further, Market Umbrella has also developed NEED, a tool for measuring the social impact of local markets. Once this survey system is up and running, it will be a major contribution to the increasingly complex and rich system of regional food systems growing up around the U.S.

- **Disasters can become catalysts for change**

Hurricane Katrina represents both a region-specific challenge and a lesson in regional resilience. For New Orleans, the hurricane was a disastrous setback. Yet, looking back on the period since Katrina, it is obvious that the disaster became a catalyst for local people and new residents to re-imagine the food system. Since the hurricane, many new players have emerged to support many different aspects of the system.

- **Diverse participation in the food system remains a challenge**

While taking advantage of the new energy for building the food system, leaders like Market Umbrella need to make sure African Americans and low-income people are represented as partners, producers, and consumers. Market Umbrella has already partnered with a wide array of rural farmers from the region to build their Crescent City farmers markets.

McCarthy makes the point that if one of the markets' goals is to increase the wealth of rural farmers, it makes sense to connect them to well-resourced urban consumers.

At the same time, Market Umbrella faces the same challenge of any organization engaged in the creation of an equitable local food system: to increase food access to vulnerable populations. To that end, Market Umbrella has chosen market locations that balance the needs of the vendors and consumers of all stripes. The Mid-City market on the edge of a low-income neighborhood is a good step in this direction. In addition, all of their markets are located on routes for public transportation and feature EBT machines.

There is still work to be done on this delicate balancing act between supporting rural farmers and providing healthy foods to vulnerable urban populations. In terms of encouraging low-income consumers at the Crescent City markets, McCarthy argues, "If it has taken us a decade to build consumer support for local foods and all of its complications among consumers who are literate and engaged, then how long might it take to achieve the same kind of solidarity and support from those who are new to the equation?" He makes the good point that this work will take time.

- **Benefits to rural places and producers in food systems are still not well understood**

Market Umbrella has made great strides in connecting rural producers with new urban markets. The organization's intentional focus on rural-urban linkages is a model for emerging food systems in rural regions. More study of rural-specific representation and impacts in the New Orleans system would contribute to the organization's mission of strengthening the system as a whole.

- **Environmental issues are trumped by economic and social issues**

Another challenge for Market Umbrella is its relatively weak focus on environmental outcomes so far. Though environmental issues are part of their mission, economic and social issues have taken precedence over environmental ones when the nonprofit is making decisions about its activities in the community. In the New Orleans region, there are perfectly good reasons to focus on the economy and society first, but there is room for more emphasis on how the food system affects the region's natural capital.

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Section 4
Plastics from Plants

A Case Study of NatureWorks LLC, Blair, Nebraska

Photo: Omaha Public Power District

Alan Okagaki and Brian Dabson

Contents

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4.1 Introduction

In February 2012, President Obama issued a Presidential Memorandum directing the Federal government to take steps to increase the purchase of bio-based products over the next two years in order to create jobs and drive innovation where bio-based products are grown and manufactured. The aim is spur a 50 percent increase in the number of new products that are designated as bio-based. It was noted by the Secretary of Agriculture that the bio-based products sector marries the two most important economic engines for rural America: agriculture and manufacturing.

The 2002 Farm Bill provided a definition for bio-based products: commercial or industrial products (other than food or feed) that are composed in whole, or in significant part, of biological products, renewable agricultural materials (including plant, animal, and marine materials), or forestry materials. This definition is broadly similar to the one used in the European Union, which also notes that,

> "…bio-based products may range from high-value added fine chemicals such as pharmaceuticals, cosmetics, food additives, etc., to high volume materials such as general bio-polymers or chemical feedstocks. The concept excludes traditional bio-based products, such as pulp and paper, and wood products, and bio-mass as an energy source"
>
> (European Commission, 2007, pp.1-2).

In 2005, bio-based products accounted for seven percent of global sales and $77 billion in value within the chemical sector (European Commission, 2007). In 2010, the sales volume of biotechnology products was around $120 billion worldwide, and is estimated by one source to increase to over $300 billion in 2015 and to $600 billion in 2020 (Festel, Detzel,& Maas, 2012). A more cautious estimate (Nieuwenhuizen & Lyon, 2011) suggests a 2025 range of between $230 billion and $550 billion, equivalent of seven to 17 percent of the total chemical market.

The major factors driving the demand for bio-based products (European Commission, 2007) include the limited availability and increased cost of fossil resources versus renewable bio-based resources, and a changing consumer demand based on the awareness of the need to ensure sustainable production and consumption. The future growth potential is in their capacity to substitute for fossil-based products, to be greenhouse gas neutral, and to be manufactured using less energy and water and generating less waste.

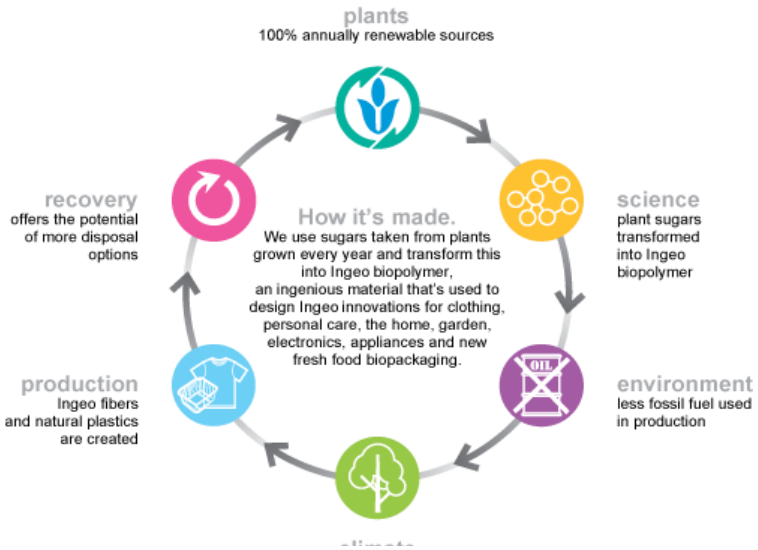
This is the context for the case study of a bio-based product company in Nebraska. The ability to transform a renewable crop – in this case, corn – into a value-added plastic resin that can be used to make low carbon footprint and/or biodegradable products would seem to have the potential to be a game changer for rural America. This case study looks at its impact on the region and the local community, through the wealth creation lens.

4.2 Overview of NatureWorks LLC

NatureWorks LLC is a private company, wholly owned by the Cargill Corporation, a privately-held agricultural products corporation. It is the world's largest producer of plastic resin derived from plant material rather than petroleum. The production facility, located in the Cargill Biorefinery Campus in Blair, Nebraska, has a nameplate capacity of 300 million pounds of plastic resin per year and until recently accounted for the majority of the world's total production of bioplastic.

NatureWorks manufactures a polylactide (PLA) polymer under the trade name "Ingeo" which can be formed into flexible films, fibers, nonwovens, injection-molded, and thermoform plastic products. In addition to being manufactured from a renewable resource (currently corn), Ingeo is produced with 50 percent less energy input than petroleum-based plastics such as PET (even when accounting for the non-renewable energy embedded in the corn). Unlike petroleum-based products, Ingeo is compostable in an industrial composting facility. Ingeo is price competitive with fossil-based resins such as polystyrene and polypropylene. It is currently being manufactured into over 40 families of products including food packaging, food service ware, clothing, home textiles, personal care products, durable electronic goods, and even automotive interior parts.

Figure 17: The Ingeo Process



Source: www.natureworksllc.com

NatureWorks sells roughly 40 percent of its product to companies in the United States and somewhat lesser shares to Asia and Europe. While the production facility is located in Blair, corporate headquarters are near Minneapolis, Minnesota and there are also offices in Europe and Asia.

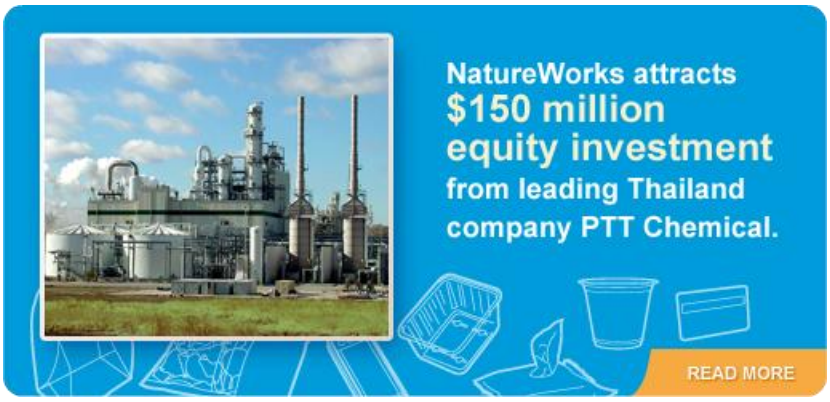
The genesis of NatureWorks was in 1988 when Cargill made a commitment to develop new product lines based on plant starches manufactured by the company. Between 1988 and 1994, Cargill invested in significant research that resulted in multiple advances in converting plant sugar via fermentation into lactic acid and producing polylactide polymers (PLA) based on those lactides that had commercially viable properties. In 1994, Cargill built a small-scale pilot manufacturing plant in Savage, Minnesota to test its production concepts and to begin developing a market for its new PLA product.

Cargill soon realized that it needed a partner with more experience, standing, and manufacturing experience in the plastics industry. Thus, Cargill-Dow, LLC was founded in 1997 as a 50/50 joint venture with the Dow Chemical Company to commercialize the PLA polymer. Operating under the trade name "NatureWorks", Cargill-Dow built the production facility in Blair in 2001. Dow withdrew from the partnership in 2005, in part because sales volume did not materialize as quickly as desired and financial performance was weak. Cargill bought out Dow's share of the company and renamed it "NatureWorks,

LLC." Cargill sought an additional investor and in 2007 partnered with the Japanese plastics firm Teijin. Teijin, however, was hit hard by the global recession and sold its share of NatureWorks back to Cargill in 2009.

Over the past several years, NatureWorks has been in a growth mode. Sales have increased annually by 25-30 percent in the last three years. A plant expansion in 2009 doubled production capability to its current 300 million pounds per year.

In October 2011, PTT Chemical Public Company Limited (PTT Chemical), the largest chemical producer in Thailand, announced that it was making a $150 million equity investment in NatureWorks. NatureWorks and PTT Global Chemical will partner in building a second Ingeo production facility in Thailand. The Thailand plant is planned to be operational in 2015 and will utilize locally abundant sugar cane or cassava root rather than corn as its source of plant sugars. This facility in Thailand shortens supply chains for its growing Asian markets and gives the company more credibility in the marketplace. NatureWorks indicates that some large customers have expressed concern over Ingeo because they did not want to be dependent on a single source of supply (the one plant in Blair).



Source: www.natureworksllc.com

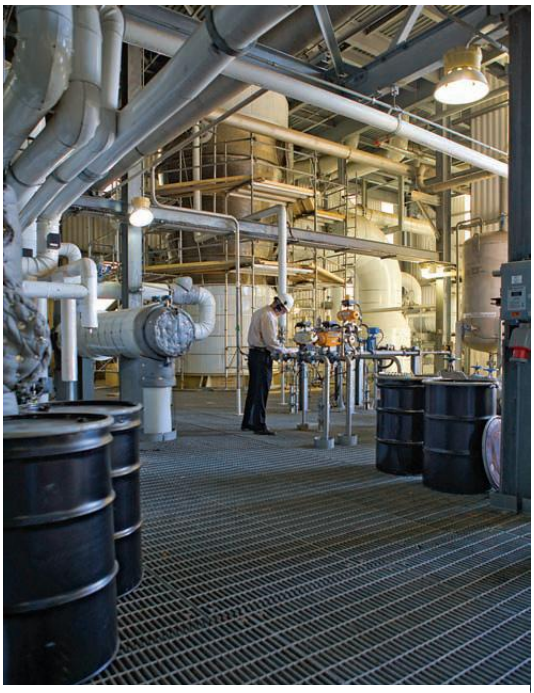
Meanwhile, the Blair plant will undergo another expansion in 2012 to a nameplate capacity of 350 million pounds per year. If an Ingeo sales price of roughly 90 cents/pound is assumed, then the Blair plant will have the capacity to produce in the neighborhood of over $300 million of product annually. Over the longer term, NatureWorks expects Ingeo market to continue to grow and that the company will either build more plants or license the technology. The company is also interested in expanding Ingeo beyond the current lactic acid platform into other types of bioplastics which either on their own or combined with PLA can meet a broader range of market needs.

4.3 The Value Chain

The NatureWorks LLC value chain has to be understood in the context of the Cargill Biorefinery Campus on which it is located. The Campus is an industrial park, one square mile in size, adjacent to the Missouri River, and developed by Cargill in 1994. The philosophy behind the Campus is to utilize all parts of the corn for the manufacture of product. In addition to NatureWorks, the Campus includes Cargill's corn wet processing mill and other Cargill companies that produce corn oil, ethanol fuel, erythitrol (a non-caloric sweetener), and animal feed. Three non-affiliated companies are also located on the Campus. Purac makes lactic acid for non-NatureWorks uses; Evoniks manufactures lysine (an amino acid) used as a supplement in animal feed; and Novozymes, a Dutch company, is constructing a plant that will produce enzymes for use in fuel ethanol plants. The total capital investment in the campus exceeds $1 billion and it constitutes the largest concentration of private investment in the state of Nebraska.

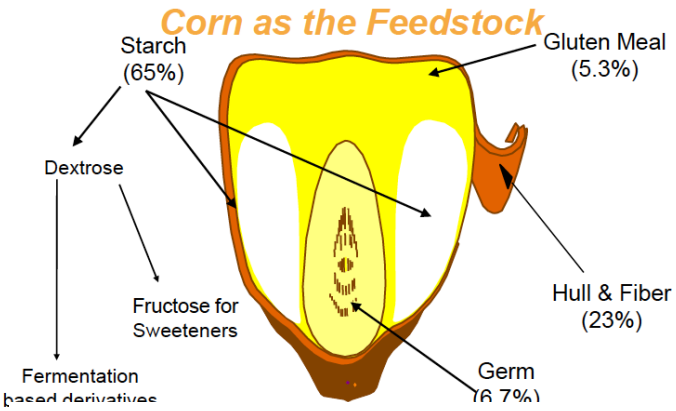
Cargill sited the Biorefinery Campus in Blair primarily because of its access to corn. Nebraska is the third largest corn producing state in the country and the neighboring state of Iowa, across the Missouri River from Blair, is the nation's largest grower of corn. The Biorefinery Campus sources 60 percent of its corn from five counties in Nebraska and Iowa, roughly a 25 mile radius. The remaining 40 percent of corn supply is grown within a 60 mile radius of the Campus. Cargill buys corn directly from farmers. The facility receives corn 365 days per year.

The heart of the Campus is Cargill's wet processing mill which breaks corn kernels down to their constituent parts: starch (65 percent of the kernel), germ, gluten, hull and fiber. The Biocampus utilizes one variety of corn, Yellow Dent #2. Corn starch is converted into dextrose (a simple sugar) and then fermented into lactic acid. NatureWorks buys the lactic acid from Cargill and converts it into a monomer called "lactide." Using catalysts, the lactide molecules are then strung together into long chains (polymers) called polylactides (PLA). Ingeo is a PLA.

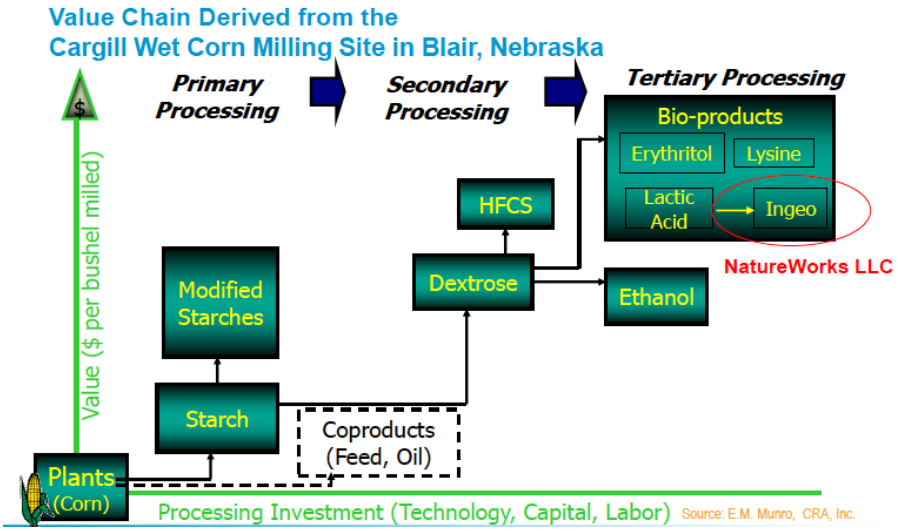


NatureWorks LLC, Blair – Photo: Omaha Public Power District

One bushel (56 pounds) of corn yields 32 pounds of corn starch which ultimately will convert into 19 pounds of Ingeo resin. The finished product is a translucent pellet which is sold in 750 kilogram boxes, 1000 kg super sacks, or in bulk, shipped by rail or truck.



Source: www.natureworksllc.com



NatureWorks makes over 15 distinct Ingeo grades, each with polymer chains of differing lengths, and each with different chemical and physical characteristics and each designed for different end-uses and products. Ingeo competes in various applications with conventional petroleum-based plastics which include polypropylene (PP), polyethylene terephthalate (PET), and polystyrene (PS). It is currently is priced as low as 90 cents per pound, depending on the specific grade, volume requirements, and contract conditions, and is increasingly cost-competitive with petroleum-based plastics. The price of competing plastics fluctuates depending largely on changes in the cost of petroleum (the feedstock). For example, in 2005 food packagers absorbed price increases of 30-80 percent for conventional plastics as a result of changes in petroleum price. Ingeo can be formed into finished products using the same manufacturing equipment as competitor plastics. It can be transformed into films, sheets, fibers, and flexible or injection molded durable (multiple use, lasting products) forms. Ingeo plastic has two product characteristics that limit its application: limited heat resistance and permeability to gases as compared to conventional plastics. Thus, Ingeo has often been utilized in cold food containers but not for hot food. Similarly, while Ingeo has been formed into bottles for still water and juices, it is not suitable for carbonated beverages.

NatureWorks sells Ingeo to over 50 companies in the United States as well as to firms in Europe and Asia. Ingeo has been incorporated into product representing more than 100 consumer brands and retailers. The most prevalent applications have been in the food industry: clamshells, plastic utensils, food containers (such as yogurt containers), and water and juice bottles. Two other growth areas are non-woven fiber applications (disposable diapers, hand wipes), and the durables market (e.g., phone casings).

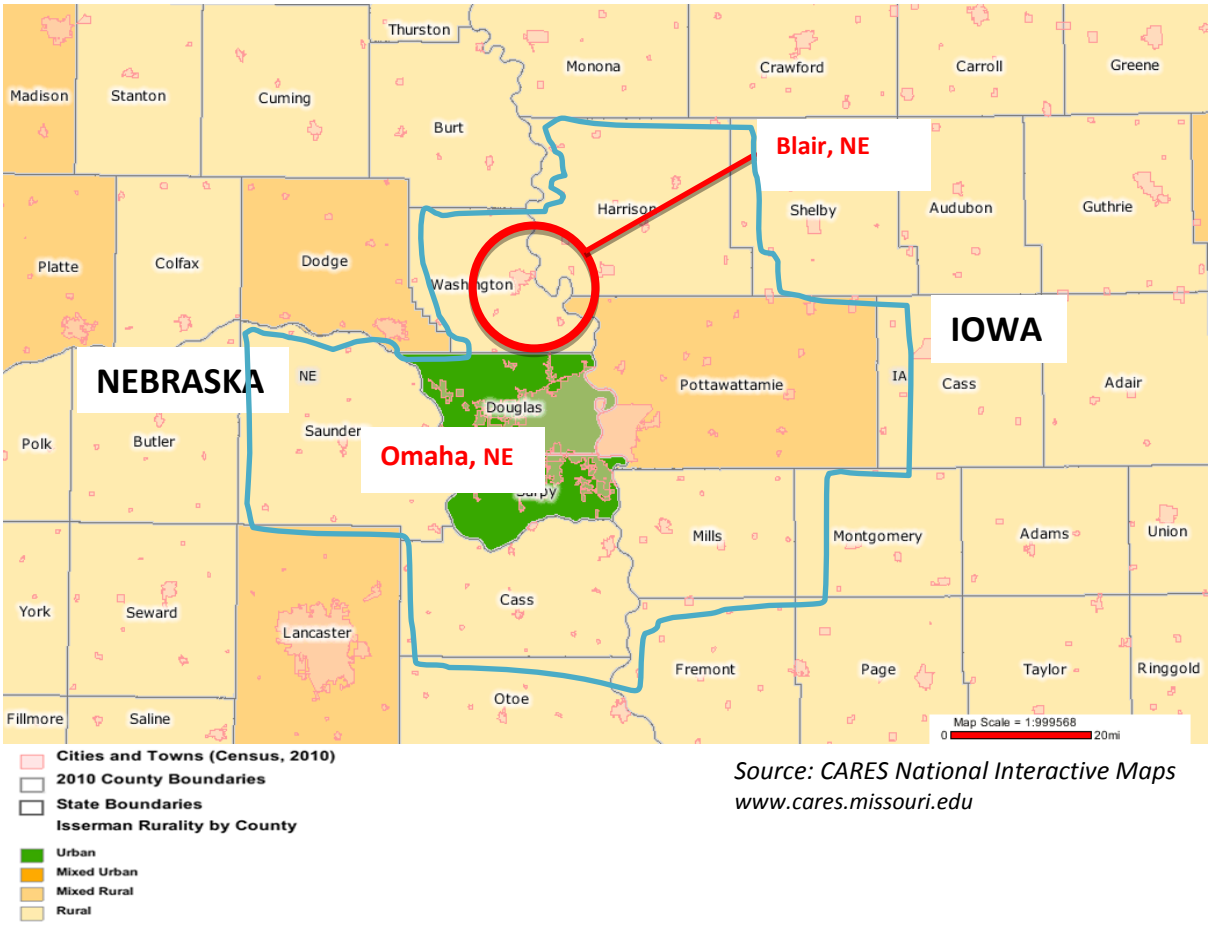
While Ingeo often competes in a commodity plastic resin market, its environmental credentials are a major part of the product's brand. NatureWorks positions Ingeo as "offering the performance of conventional plastics and fibers with a fraction of the greenhouse gas emissions and lower non-renewable energy requirements." NatureWorks also emphasizes that Ingeo has more "end-of-life options" than other plastics. Ingeo can be composted, recycled or incinerated. Ingeo products can be converted back into lactic acid, for use as an industrial feedstock including the production of more Ingeo. In addition, Ingeo has more stable pricing because it is not subject to the large fluctuations in the cost of petroleum.

NatureWorks manages sales out of its headquarters near Minneapolis, Minnesota. Of about 100 employees in total, 35 work in the Blair facility and another 40 are located in the headquarters office. The remainder of NatureWorks staff – primarily sales and technical support – is spread across offices in the United States, Europe and Asia. It recently added a salesperson in Mexico to gain a presence in Latin America. Thus, NatureWorks represents not so much a "rural-urban" linkage as it does a "rural-global" linkage. The linkages are made through a sophisticated sales infrastructure with physical presence on three continents. Much of the sales and distribution knowledge came through Cargill's earlier partnership with Dow, a company with more experience and relationships in the plastics industry than Cargill.

4.4 The Region

Blair is located about 30 miles north of Omaha in Washington County, part of the Omaha-Council Bluffs metropolitan area, outlined in blue on Map 5. Washington County had a 2010 population of 20,234 of which 7,990 lived in Blair, the largest town and county seat.

Map 5: Location of Blair, NE



Source: CARES National Interactive Maps
www.cares.missouri.edu

Census data indicate that the populations of Blair and Washington County are virtually all white (96.4 percent and 97.2 percent and have median household incomes substantially higher than the state as a whole. The 2009 poverty rate is roughly one half that for the state as a whole. The adult populations of Blair and Washington County are slightly better educated than Nebraska as a whole as measured by percentage of adults with high school degrees and percentage of adults with bachelor's degrees. The age demographics of Blair and Washington County closely mirror those of the state. Both Blair and Washington County grew in population between 2000 and 2010 at rates close to the state's population increase. Nebraska as a whole had a very low seasonally-adjusted unemployment rate (November 2011) of 4.3 percent, but Washington County's rate was even lower at 3.4 percent.

Thus, Washington County goes against the more common pattern of rural areas of being less wealthy than urban areas. By several definitions, Washington County would not be considered "rural" because of its location within the Omaha-Council Bluffs metropolitan area. However, its population density, land use and general character are much more rural than urban. Map 1 shows Nebraska and Iowa counties as classified by Isserman – Washington County can be seen to be predominantly rural, in common with most Nebraska counties. It has a population density of 51.9 persons per square mile which, though greater than the state average of 23.8, is far less than adjacent Douglas County, which contains Omaha, at 1,574 persons per square mile.

The southern edge of the county, which is closest to Omaha, is undergoing some housing development, but the remainder of Washington County is dominated by agriculture. In 2007, the county had 217,306 acres of land in farms, which constitutes 87 percent of the county's total land mass. After Blair, the next largest population centers are the city of Fort Calhoun, with a 2000 population of 856 people and the village of Arlington, population 1,197 (2000).

Thus, in terms of its population density, settlement patterns, economic uses of land, and general character of the landscape, Washington County is clearly rural. In terms of its labor market, however, Washington County has a strong connection to Omaha. Residents describe the high volume of commuter traffic from Blair and Fort Calhoun into Omaha but also the equally large number of people who live in Omaha and commute to jobs in Blair (such as the Cargill complex) or Fort Calhoun (which has a nuclear power plant and manufacturing facilities.

Five counties (Washington and Burt in Nebraska, and Harrison, Monona and Shelby in Iowa) supply the Cargill facility with 60 percent of its corn. Washington and Harrison counties are part of the Omaha-Council Bluff metropolitan statistical area; the other counties are non-metropolitan and non-micropolitan.

The data strongly indicate that Washington County is faring much better than its neighbors. All five other counties lost population between 2000 and 2010 and four of the five counties lost 6-19 percent of their jobs. Washington County had a median household income between $9,000 and $19,000 higher than the other counties and a significantly lower poverty rate. While all of the counties had similar percentage of adults with high school degrees, Washington County had a much higher percentage of adults holding college or advanced degrees. This is probably due to professional and managerial persons living in the south part of the county who commute to Omaha.

The most common forms of agriculture in Washington County are corn and soybean farms and cattle operations. Corn and soybeans are raised on two-year rotations. While there is some irrigation in the western part of the county, most corn is raised on dryland operations. Most farms are family owned

and operated; corporate farms are rare or non-existent. The general trend has been a movement away from livestock and more towards corn. Washington County produces feed corn, not sweet corn. Prices for feed corn have been strong since 2007, partly because of the demand for corn for ethanol production. The local market for corn is described as very competitive. In addition to the Cargill Biorefinery Campus, there are several cooperatives and grain elevators that purchase corn.

4.5 Wealth Created

Economic Wealth Creation

NatureWorks employs about 35 workers fulltime and has an additional 35 contract workers on-site performing maintenance, packaging and supply chain logistics. Additional workers are employed for plant expansion projects. The staff composition breaks down as:

- 16 technicians (hourly employees)
- 6-8 technologists (hourly)
- 2-3 administrative support (hourly)
- Remainder, professional and managerial positions

The hourly positions start at $16/hour and can move up to $25/hour. Most of the training is done on-site; the only educational requirement is high school diploma. Some of the hourly employees have gone on to college and received degrees but further formal education is not a requirement.

According to a 2009 Cargill factsheet, the Biorefinery Complex as a whole employs over 500 people in production, administrative and management positions. It pays over $40 million in wages, salaries and benefits. Cargill processes approximately 300,000 bushels of corn every day and pays more than $350 million annually to corn producers. It purchased $170 million of products and services from area businesses and paid nearly $3 million in property, sales and use taxes. This represents an aggregate annual expenditure of over $560 million into the local and area economy.

Paula Hazlewood, executive director of the Gateway Development Corporation, estimates full-time employment at the Biorefinery Campus currently at 600 plus another 600 contract employees. About half of the workers live in Washington County; the rest commute in from a 50-60 mile radius. The Campus represents $1.5 billion of total investment, making it the largest single investment in the state of Nebraska.

The 600+ jobs at the Biorefinery campus account for 10 percent or more of all jobs in Washington County. If one counts the contract workers cited by Hazlewood, the percentage rises closer to 20 percent. The dollar impact from wage income ($40 million annually) is much smaller than that for corn procurement ($350 million) and contracted services ($170 million). Also, the generally high wages ($15 - $25/hour) for persons with no more than a high school degree might be having an effect raising wage rates more generally in Washington County.

The Biorefinery Campus has also had substantial spin-off and multiplier impact on the surrounding area. At least three trucking companies have located in or around Blair because of the Campus. Unlike many rural communities, downtown Blair has relatively few vacant storefronts. Blair had retail sales per capita of $81,000 (2007) as compared to $31,000 for Washington County, and $15,000 for Nebraska. The

other four rural corn-producing counties captured retail sales between $5,800 and $18,800 per capita. Blair has become a retail hub for much of the surrounding area.

Cargill purchases 60 percent of its corn, approximately 65.7 million bushels annually, from five counties: Burt and Washington counties in Nebraska and Harrison, Monona and Shelby counties in Iowa. These counties had 2009 total corn production of 146.5 million bushels and 2010 production of 120.2 million bushels.[15] Thus, Cargill buys approximately 50 percent of the corn produced in those five counties. Moreover, Cargill pays farmers a price premium of as much as 10 cents per bushel in order to ensure the wet mill has a continuous supply of corn. Cargill has limited on-site grain storage so it cannot buy and stockpile large quantities of grain when prices are low. It will buy from farmers on future contracts or on the spot market, a flexibility which has value to farmers by providing a premium-priced market.

It is difficult gauge to NatureWorks' share of this $560 million of direct economic impact created by the Biorefinery Campus.[16] If NatureWorks were producing at its nameplate capacity, it would be consuming only a small portion of the starch processed by the Cargill wet mill. On an employee basis, NatureWorks accounts for only about seven percent of the Biorefinery workforce. On the other hand, the investment in the NatureWorks plant is a high percentage of the capital investment on the Biorefinery campus. This reflects the capital intensive nature of plastics production.

Environmental Impact

NatureWorks claims its Ingeo product has four primary environmental advantages over conventional, petroleum-based plastics. These advantages are:

- The feedstock for producing the polymer is a renewable resource – natural plant sugars – rather than a non-renewable resource such as petroleum.
- The energy input to manufacture Ingeo is substantially less than that for conventional plastics.
- The carbon footprint from Ingeo production is 60 percent less than for conventional plastics such as PET.
- The final product has more end-of-life options than conventional plastic products. It can be recycled or re-processed. If disposed, it can be composted within three months in an industrial composting facility.

NatureWorks has contracted for third-party life cycle environmental analyses of Ingeo in various consumer product scenarios which verify these points. In a recent assessment, Stonyfield Farm contracted with two scientists from the Donald Bren School of Environmental Science and Management at the University of California, Santa Barbara, who compared yogurt cups made from Ingeo with those manufactured from polystyrene. Kuzcenski and Geyer divided the lifecycle of the yogurt cup into four stages:

- Material production (from cradle to polymer, including transportation)
- Transportation (from polymer to end-of-life)
- Container manufacturing
- Container end-of-life management

[15] http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/index.asp

[16] Cargill and NatureWorks are private held corporations; financial information is not readily available as for publicly-traded companies.

They examine environmental impacts along multiple dimensions including fossil energy consumption, overall energy use, global warming potential, potential for acid rain, terrestrial and aquatic eutrophication, human toxicity (carcinogens; particulate emissions), water use and land use. The major conclusions were:

- With the exception of carcinogenicity, most of the environmental impact in the Ingeo yogurt cup lifecycle occurs during the material production stage.
- Ingeo production requires 55 percent less fossil energy than polystyrene production, because of its renewable feedstock.
- Ingeo production uses 22 percent less total energy, again due to its lower feedstock energy input.
- If one counts carbon sequestered by the corn feedstock, Ingeo results in only 40 percent of the greenhouse gases of polystyrene production.

Human Capital

Aside from the on-site training of staff, the Biorefinery Complex's largest contribution to human capital has been its role in the Washington County Technology Center. The Technology Center is part of the Metropolitan Community College system serving the greater Omaha area. It opened in Spring 2011 after six years of planning. Its purpose is to provide a pipeline of trained workers for the Biorefinery Campus and the Fort Calhoun Nuclear Power Station which is also located in Washington County. Cargill and three other companies on the Campus raised $550,000 towards start-up and the first years of operating expense. They were also instrumental in designing the curriculum and donating equipment for training.

Physical Infrastructure

The largest contribution of the Biorefinery Campus towards physical infrastructure has been Blair's water system. Cargill buys 12-13 million gallons of water per year from Blair; the rest of the city consumes 2-3 million gallons. When Cargill built the Campus, it signed a "pay or take" contract with the City which enabled the City to do the bond financing for the water system. Partially as a result, the City has not raised water rates for 20 years. Blair similarly has much more sewer capacity than it would otherwise have. In turn, the water and sewer capacity have become part of Blair's (and Cargill's) competitive advantage in recruiting new companies to the Biorefinery Campus. The latest company to locate on the Campus is Novozymes, which produces enzymes that convert corn starch into ethanol. The water and sewer infrastructure were contributing factors in Novozymes' decision to build its new production facility on the Campus.

Contributions to the Community

The Cargill companies work at being good corporate citizens. The Cargill companies made a $750,000 contribution to start a YMCA in Blair. The campus as a whole participates in United Way campaigns – in 2009, the Cargill companies contributed $600,000. Employee participation in community activities is encouraged. With pre-approval, Cargill will match employee donations of time or money. For example, an employee who spends four hours per month volunteering at a food kitchen can get paid for the volunteer work.

4.6 Conclusions

NatureWorks offers a number of insights into the discussion of wealth creation and the linkages between rural and urban economies.

- Whereas much of the focus on capturing economic wealth from natural resources tends to be on identifying niche markets that provide premium prices for products that meet certain sustainability or triple-bottom requirements, Nature Works represents a very different approach. Ingeo is a value-added product that, while beginning to compete in commodity markets, by virtue of its sustainability characteristics relies less on premium pricing and more on gaining access to new markets and conveying value to customers.

- The value has several dimensions. First, bio-plastics are not only price competitive with petroleum-based products but also offer a higher degree of price stability. Corn prices are not as volatile as those for oil. Second, Nature Works' manufacturing process has been shown to have significantly lower negative environmental impacts as compared with those for conventional plastics. In addition, the end-of-life options for recycling and reprocessing is a particularly attractive feature in countries with limited landfill capacity. Together these make Ingeo a serious option for companies wishing to upgrade or protect their "green" credentials – Wal-Mart, Toyota, and Stonyfield Farms are downstream customers in the market channels into which NatureWorks sells.

- Another insight relates to scale. Ingeo represents over 20 years of investment by Cargill, and over that time two major co-investors came and went because of doubts about being able to see returns on their capital. But Cargill continued to see potential in the product and invested hundreds of millions of dollars in Nature Works. This is part of a $1.5 billion investment in the Biorefinery Campus, the largest concentration of private investment in Nebraska. The economic development impacts on the region are also at scale. The campus employs 600 people (10 percent of the county's workforce), and spends in aggregate over $560 million a year in the local and regional economy. The share that is attributable to Nature Works is hard to calculate, but in terms of jobs created and scale of inputs it is a small part of the total campus; nevertheless worldwide annual sales of Ingeo are projected to be in the order of $280 million.

- The value chain for Ingeo is both integrated and separate from the Cargill operations on the campus. Cargill purchases the corn, 60 percent of which comes from five counties, and then processes it into corn starch, which in turn is converted into lactic acid, the primary input for Ingeo. From there, Nature Works generates Ingeo resin for sale to over 50 companies in the United States and more worldwide. The company employs 100 people, 35 of whom are in Blair. The rest are at the head office in Minnesota or in sales and technical support offices in the United States, Europe and Asia.

- The rural-urban linkage is essentially encompassed in a regional framework. Washington County, in which Blair is located, is very rural on most indicators but it is an integral part of the Greater Omaha region. This manifests itself in several ways. There is significant commuting in both directions between Blair and Omaha. One of the principal location criteria for the campus was access to corn, but other important locational factors include access to Omaha airport and to the amenities and services a major city offers. Washington County also benefits from being

part of the Gateway Development Corporation, a four-county regional economic development centered on Omaha. This organization was, and still is, an important player in the development of the campus. Another regional linkage is the Washington County Technology Center, a project of the Greater Omaha Community College.

- The reported significance of social capital in Blair is a further insight. There was a history of volunteerism and corporate responsibility before Cargill began its development, which proved to be an important locational factor, and has continued to be the way of doing business in the community. This civic infrastructure allows collaboration across sectors and interests, and is reinforced by Cargill's charitable giving and support for the voluntary activities of its workforce.

- One aspect that was outside the scope of this case study, but which requires further consideration, are the effects of extensive corn farming to serve the Cargill plant on the environment, in terms of its impacts on water quality and ecology. It would be of interest to know the extent to which locally- and regionally-borne costs offset the overall benefits associated with bio-based products.

- Finally, the community has benefited from low water rates for 20 years as the result of the investment it made in a new water and sewer system to handle the requirements of the campus and the fact that Cargill buys 80 percent of the water. This infrastructure has itself become an attraction factor for subsequent private investments on the campus.

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Section 5
Wind Energy and Rural Development

A Case Study of West Texas

Adam Paul Blair

Contents

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Photographs are provided by the author.

5.1 Introduction

With a quarter of total installed capacity in the U.S.,[17] the State of Texas is currently leading the nation in the development of wind energy. Wind energy is promoted as a reliable, domestic energy source free of adverse environmental impacts at the national level. In rural regions like West Texas, wind has been celebrated for its ability to provide a supplemental income to struggling farmers, create jobs, and increase local tax revenues (DOE 2004; Myers 2009).

And although wind energy only accounted for 1.9 percent of total U.S. electricity generation in 2009, Texas—with plans to construct thousands of miles of transmission lines to accommodate future development—is a driving force behind the U.S. Department of Energy's goal of providing 20 percent of national electricity needs with wind energy by 2030 (DOE 2008). For wind to provide one-fifth of the nation's electricity, however, there are a number of challenges to consider, including:

- Energy economics and the production process (i.e., technology, manufacturing, transmission) (Lu et al., 2011),
- Potential impacts to wildlife and the environment (Kunz et al., 2007; Arnett et al., 2008),
- Visual and noise impacts on communities (Devine-Wright, 2005a, 2005b; Johansson & Laike, 2007; Pedersen & Wye, 2007; Pedersen et al., 2009; Swofford & Slattery, 2010), and
- The distribution of wealth generated by the industry (HRO, 2008).

And while conflicts surrounding the development of renewable resources may never cease, Pasqualetti reminds us that "considering more deeply the relationship between landscapes and the people who occupy and value them, in advance, will help smooth the otherwise bumpy road toward a more sustainable future" (2011, p.915).

The Texas case is particularly thought-provoking because of the important rural-urban linkages that comprise the wind industry value and supply chains. A transition to more renewable forms of energy requires increasing amounts of land used in energy production, while the demand for electricity is concentrated in urbanized areas.

Based on the interviews conducted for this study, the West Texas story is in many ways a positive one. Given the scale of investment and rapid growth of the wind industry in the state, the Texas experience can provide important lessons for other communities and regions across the country as wind energy becomes more ubiquitous. More specifically, a better understanding of the extent to which wealth created by wind energy development remains in the communities that it is generated in can better inform state- and local-level economic and community development policies and programs.

Furthermore, a nascent literature on wind energy and community impacts has so far failed to distinguish between various types of wealth when considering the costs and benefits associated with the industry (Patullo 2010; Brannstrom et al. 2011; Slattery et al. 2011). As a consequence, community leaders may benefit from a better understanding of the cumulative impacts of this fast-growing industry and the relationship between different forms of wealth.

[17] Currently there is 40,181 MW of installed capacity in the U.S., enough to supply electricity for over 10 million American homes (see http://www.awea.org/newsroom/pressreleases/release_07APR11_.cfm).

5.2 The National Picture

> *"At this point, 2012 is poised to be one of the largest years, if not the largest year in the U.S. wind market, in terms of installation."*
>
> Alex Klein, IHS Energy Research

The history of wind power—a centuries-old but largely marginal technology—has bemused proponents and historians for decades. In fact, until the 1970s, when the Arab Oil Embargo increased the price of electricity generated from oil, wind energy was largely obsolete. As recently as 1980, global generating capacity totaled a mere 10 megawatts (MW), or enough electricity to power approximately 3,000 U.S. homes (Vasi, 2011). Today, just over 30 years later, this figure exceeds 74,000 MW (74 gigawatts).[18]

After a decade of trailing countries like Germany and Spain, the U.S. retained its leadership in 2006 as Iowa and Texas became the first states to institute renewable energy requirements, and the use of a federal production tax credit became more prolific (DOE, 2008). By the end of 2009, the U.S. had close to 35,000 MW of installed capacity and an average annual growth rate of 39 percent from 2005 to 2009 (AWEA, 2010). Even so, wind energy still supplied less than one percent of the electricity generated in the U.S. in 2010, a figure that pales in comparison to coal, nuclear, and natural gas.[19]

Wind is also far from reaching its full potential; in fact, a number of studies have concluded that wind resources in the U.S. are more than sufficient to supply present-day and projected national electricity demands (Elliott et al., 1991; Hoogwijk et al., 2004; Lu et al., 2009). Still, many experts believe that a

[18] DOE (2008, 6)
[19] See http://www.eia.gov/totalenergy/data/annual/pdf/sec8_16.pdf.

confluence of supportive state and federal policies, growing interest in renewable energy, and advancements in wind technology and performance will fuel a continuing resurgence in wind, allowing the U.S. to remain a global competitor. The U.S. Department of Energy has propagated these forecasts, releasing a landmark study in 2008 that explores the steps needed to meet 20 percent of national electricity demand with wind energy by 2030.

Policy Drivers

In recent years, many governments around the world have set ambitious targets and goals to promote electricity generation from renewable energy sources. These efforts are often accompanied by various subsidies and incentives designed to overcome an almost ubiquitous cost disadvantage faced by renewables in comparison to electricity generated from fossil or nuclear fuels (Haas et al. 2008). While debate surrounds the efficacy of or justification for specific programs, policy and planning measures have had an undeniable effect on the development of renewables and wind energy in particular in many countries (Bird et al., 2005; Alagappan et al., 2011).

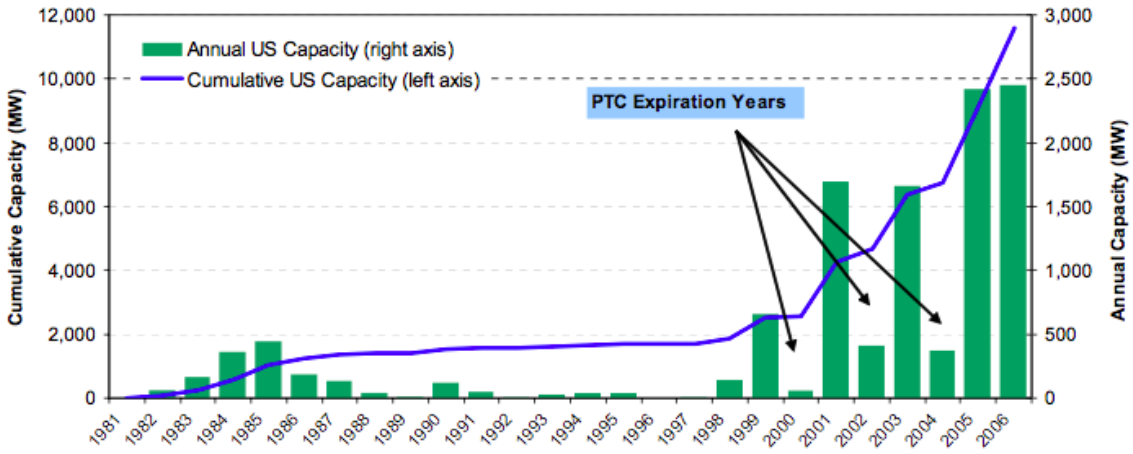
In terms of the motives behind national energy policy, Bird et al. (2005) observe that the promotion of renewables has been driven in large part by carbon abatement goals and adoption of the Kyoto protocol in Europe, whereas the U.S. has not explicitly linked energy policy with carbon policy. There is evidence, however, that some state governments are beginning to craft energy policies with carbon emissions in mind and many consumers who voluntarily purchase renewable energy often do so out of concern for climate change.

The Production Tax Credit

The federal renewable energy production tax credit, first established under the Energy Policy Act of 1992, has played a critical role in the development of U.S. wind energy capacity (Bird et al., 2005; Lu, 2011) (see Figure 18). The credit was first set to expire in 1999, but has since been renewed seven times, most recently until 2012 under the American Recovery and Reinvestment Act of 2009 (Lu, 2011). Under the production tax credit, qualified wind developers are eligible for an income tax credit of 2.1 ¢/kilowatt-hour (adjusted upward, in future years, for inflation) of electricity produced for the first ten years of operation. The production tax credit reduces the cost of wind power by roughly one-third, making wind more attractive to electric utilities and other investors, and even more competitive than conventional electrical generation sources in some regions. Given this, experts expect the growth of wind energy to slow significantly in the absence of the production tax credit or some alternative policy (Wiser, 2007; Lu et al., 2011).

Barradale (2010), Wiser (2007), and others point out that the production tax credit's repeated expiration and extension over the years has created a boom-bust pattern of development and investment. Indeed, Figure 18 shows that development has peaked in years when the credit was scheduled to expire (i.e., 1999, 2001, and 2003). The effectiveness of the production tax credit is thus limited because eligible utilities cannot rely on a consistent revenue stream, instead relying on Congressional appropriations to continue the program.

Figure 18: U.S. wind power capacity (annual and cumulative)
Source: Wiser (2007, p.6)



On November 2, 2011, Representatives Dave Reichert and Earl Blumenauer introduced a bill to extend the renewable energy production tax credit through 2016.[20] Advocates for the credit argue that if passed, the *American Renewable Energy Production Tax Credit Extension Act* (H.R. 3307) will prevent future boom-bust cycles caused by hesitation on the part of financiers and developers due to uncertainty created by pending expirations of the credit in the past (U.S. House, 2011; Witkin, 2011). As of this writing, H.R. 3307 has been referred to the House Committee on Ways and Means.

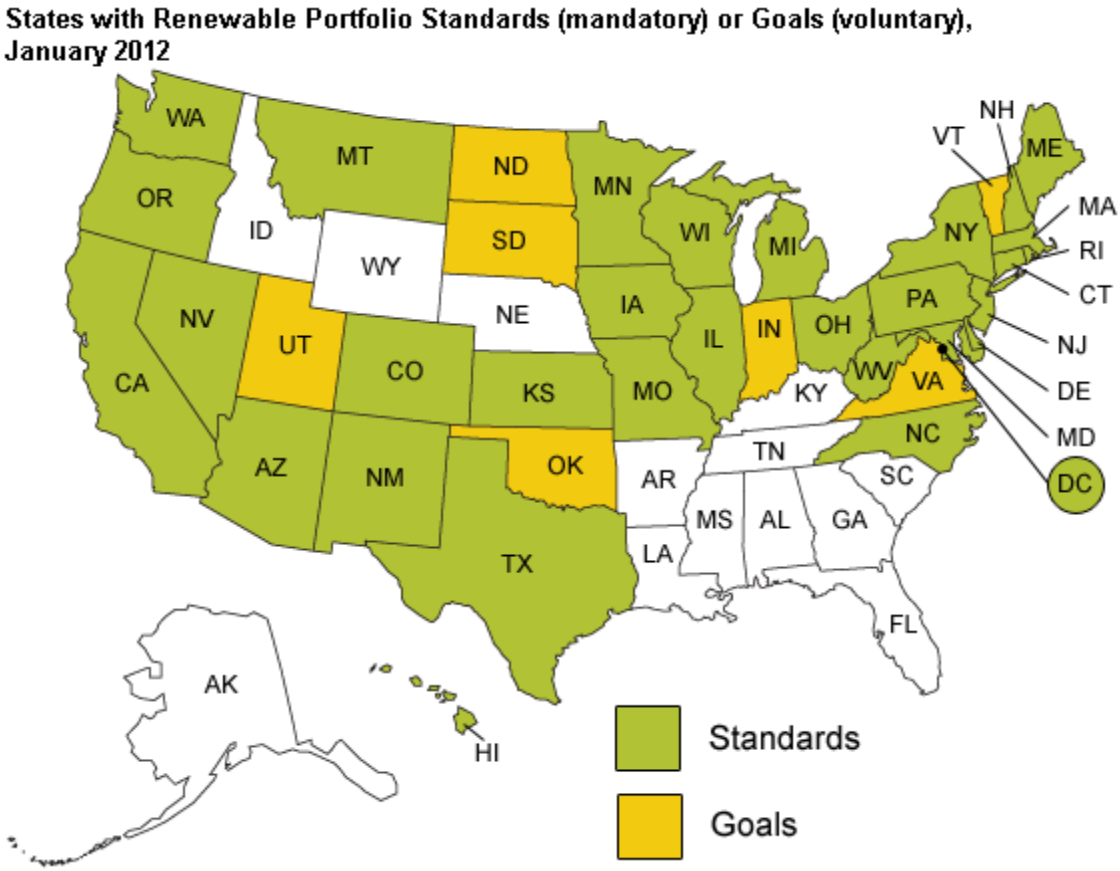
Renewable Portfolio Standards

In addition to national renewable energy mandates and financial incentives, state-level policies have also spurred a large amount of activity, especially in the U.S. States have the authority to impact the use of different energy sources through statutes, and state-run public utility commissions oversee the development of power plants and transmission lines (Sautter & Twaite, 2009).

In the absence of federally mandated development of renewables, 29 states including Puerto Rico and the District of Columbia have initiated renewable portfolio standards, key state-level drivers of wind development (Lyon & Yin, 2010; Alagappan et al., 2011) (see Map 6). A renewable portfolio standard requires load serving entities (i.e., electricity providers) to include in their resource portfolios a specified amount of electricity generated from renewable resources. Mandates vary widely from state to state, ranging from relatively short-term goals such as 29 percent by 2015 goal in New York—meaning 29 percent of electricity generated in the state should come from renewable resources by 2015—to longer-term but more aggressive goals such as Hawaii's 40 percent by 2030 mandate.

[20] The American Renewable Energy Production Tax Credit Extension of 2011, if passed, would amend Paragraph (1) of section 45(d) of the Internal Revenue Code of 1986 by striking "January 1, 2013" and inserting "January 1, 2017".

Map 6: States with Renewable Portfolio Standards (mandatory) or Goals (voluntary), January 2012)
Source: Database of State Incentives for Renewables and Efficiency (DSIRE)



Market Drivers

Important market forces have also increased the competitiveness of wind as an energy source. Chief among these has been significant volatility in the price of natural gas over the last decade, which has raised the cost of electricity from gas-fired generation, narrowing the gap between the cost of power from wind and conventional sources. In 2000, U.S. prices for natural gas averaged $3.68 per thousand cubic feet (Mcf) at the wellhead before peaking in 2005 and 2008 at over $7 Mcf. Prices have since fallen slightly again to an average of $4.16 Mcf.[21] According to Lehr et al. (2011), wind energy generation is generally cost-effective with natural gas prices at $3.50 Mcf.

The cost of generating electricity from wind has also dropped with numerous technological improvements and a movement toward larger and more efficient turbines. The average turbine installed in the U.S. in 2006 had a nameplate capacity of 1.6 MW of electrical power. While engineers have found ways to increase the height and size of turbines while minimizing costs, experts "do not expect the rotors of land-based turbines to become much larger than about 100 meters in diameter, with corresponding power outputs of about 3-5 MW," primarily because of logistical constraints related to transporting large components on U.S. highways (DOE 2008). In fact, since 1995 generating efficiencies have improved by more than 15 percent (Bird et al., 2005).

[21] See http://www.eia.gov/dnav/ng/hist/n9190us3A.htm.

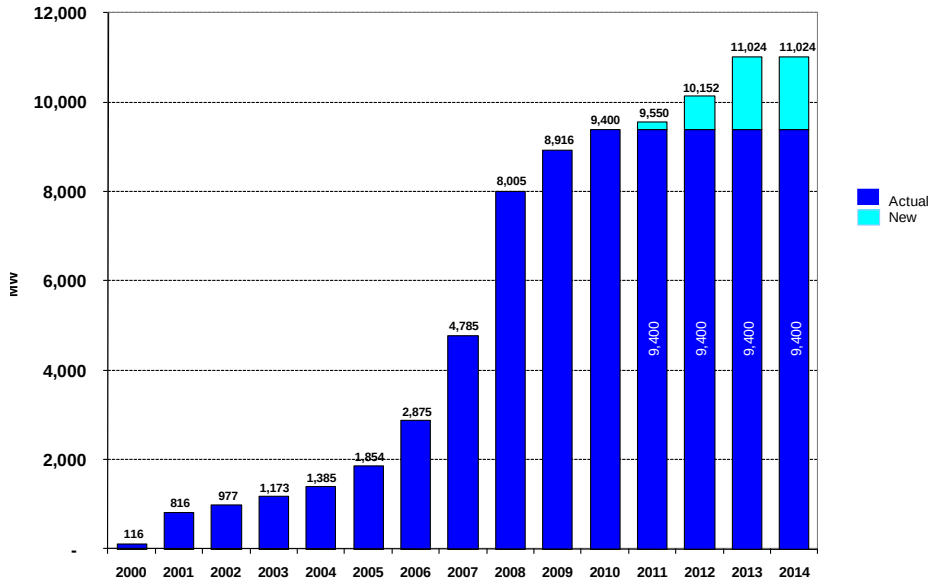
5.3 Wind Energy in Texas

Over the last decade, Texas has emerged as the leading state in the development of U.S. wind energy capacity, expanding at a greater rate than any other state (Wiser and Bollinger 2008). Texas is home to seven of the nation's top ten largest wind farms, and has a total installed capacity of 10,135 MW—nearly a quarter of national capacity[22] (AWEA, 2011; Brannstrom et al., 2011) (see Figure 19).

According to the American Wind Energy Association (AWEA), the wind industry supported 8,000-9,000 direct and indirect jobs in Texas in 2010 and supports approximately 75,000 direct and indirect jobs nationwide.[23] Using 2010 state and national employment data provided by the Bureau of Labor Statistics,[24] it is estimated that Texas has a wind industry location quotient ranging between 1.328 and 1.494.[25] This indicates that Texas is particularly strong in terms of its share of employment in the wind industry relative to the nation.

The rapid development of wind power in Texas is primarily due to favorable state and federal-level policies as well as market factors that have driven growth in the industry (Langniss & Wiser, 2003; Bird et al., 2005; Fischlein et al., 2010).

Figure 19: Texas installed wind-generating capacity, 2000-2014 (projected)
Source: Emerging Technologies Integration Plan, Electric Reliability Council of Texas



[22] According to the American Wind Energy Association (AWEA), the U.S. wind industry totals 42,432 MW of cumulative capacity as of June 2011 and represents more than 20 percent of the world's installed wind power (See http://www.awea.org/learnabout/industry_stats/index.cfm).
[23] See http://awea.org/learnabout/publications/upload/Texas.pdf and http://www.awea.org/newsroom/pressreleases/Save_USA_wind_jobs.cfm.
[24] The State of Texas employed 11,198,645 workers at the end of 2010; the U.S. employed approximately 139,415,000 workers during this time.
[25] $LQ = \frac{e_i/e}{E_i/E} = \frac{8{,}000\ /11{,}198{,}645}{75{,}000/139{,}415{,}000} = 1.328\ or\ \frac{9{,}000/11{,}198{,}645}{75{,}000\ /139{,}415{,}000} = 1.494$

Interestingly, state-level wind-enabling policies in Texas were not enacted out of any explicit concern over climate change, but were largely motivated by declining oil production, an excellent wind resource (Zarnikau, 2011, p.3906), and the promise of rural economic development within the state (Langniss & Wiser 2003, 528; Fischlein et al., 2010). Through a series of interviews with state-level policymakers, Fischlein et al., (2010) found that Texans were actually careful *not* to frame the development of renewable energy as an environmental or climate change mitigation effort out of repelling the large conservative voter base in the state.

One of the key renewable energy policies, the renewable portfolio standard, was established in 1999 under then governor George W. Bush. Texas was one of the first states to establish a renewable portfolio standard during a restructuring of the state's electricity market (Fischlein 2010), and represents one of the most ambitious state-level policies in terms of added capacity (Langniss and Wiser 2003, p.528). When first established, the renewable portfolio standard required the installation of 2,000 MW of new renewable capacity by 2009—a goal that was met by 2005 (Langniss & Wiser 2003, p.528; Public Utility Commission, 2011). Even the updated requirements of 5,880 MW by 2015 and 10,000 MW by 2025 have already been met as of 2011, indicating the significant contribution of wind energy to meeting the state's goals (AWEA, 2011; Public Utility Commission, 2011).

Competitive Renewable Energy Zones

To meet the requirements of the state's renewable portfolio standard, the Public Utility Commission of Texas has initiated the nearly $6.8 billion Competitive Renewable Energy Zones (CREZ) program. A CREZ is a geographic area where wind generation facilities will be constructed over the next several years.

In 2008, the Public Utility Commission designated five CREZ Zones for the generation of wind power and required transmission expansions that will allow for the movement of electricity from remote parts of West Texas and the Texas Panhandle to more urbanized and heavily populated areas of the state (i.e., Austin, Dallas-Fort Worth, and San Antonio).[26] The CREZ program is expected to increase Texas's current level of wind generation capacity by over 80 percent, from 10,135 MW to a level of 18,456 MW.[27] This planned development of approximately 8,321 MW of new generation capacity will cost an estimated at $6.79 billion, and is being justified on the basis of the project's ability to improve air quality, wean the state off fossil fuels, and, perhaps most importantly, stimulate the state's economy.

Context: West Texas

While the wind energy industry has impacted communities and regions across the entire state of Texas through complex rural-urban linkages, the production of electricity itself is concentrated in the western portion of the state. While West Texas is a vernacular term used by many to describe certain areas west of Austin, Dallas-Fort Worth, and Houston, there is in general a lack of consensus regarding the boundaries that separate East Texas from West Texas.

For the purposes of the following demographic and economic analyses, a functional region including only counties with installed wind capacity will be used. The majority of counties with wind development

[26] CREZ Transmission Program Information Center, 2010, "Program Overview," Public Utility Commission of Texas, http://www.texascrezprojects.com/overview.aspx.

[27] See http://www.texascrezprojects.com/overview.aspx for information on the CREZ build-out and http://awea.org/learnabout/publications/upload/Texas.pdf for more information on Texas's current capacity level.

are located in the West Texas and Northwest Texas regions in Map 7; of the 32 counties included in this analysis, two counties—Cooke and Kenedy—are geographic outliers in the sense that they are located in the eastern portion of the state. This region of analysis will hereafter be referred to as *West Texas*.

Map 7: Texas Comptroller's 13 Regions of Texas
Source: http://www.window.state.tx.us/ecodata/regional/index.html

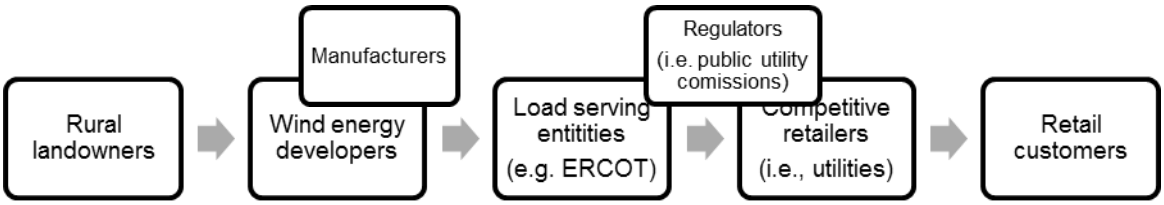
The West Texas region is considered to be rural. The 32 counties with installed wind capacity in Texas cover a total of 43,555 square miles and were collectively home to 1,087,224 people in 2010. Counties with installed wind capacity are generally very low density. Across the selected counties, population density is only 25 persons per square mile, compared to 96.3 persons per square mile in Texas and 87.4 persons per square mile in the U.S.[28] Land across the West Texas countryside is devoted primarily to agriculture uses, and is expansive and flat in most places, save for the occasional bluff.

[28] 2010 Census, U.S. Census Bureau

5.4 Rural-Urban Linkages and the Wind Industry Value Chain

Because of its low population density and abundant land, rural America will play an important role in the transition to more renewable forms of energy, which tend to be less energy dense[29] (Smil, 2010; Blair, Kay & Howe, 2011). The development of wind energy in West Texas is no exception. But while virtually all of Texas's wind production takes place on large wind farms situated across miles of farmland, much of the electricity demanded derives from large metropolitan regions in the eastern portion of the state. Moreover, like many other capital-intensive industries, the value chain connecting a single wind turbine to a consumer of wind-generated electricity is complex and dispersed geographically, consisting of myriad manufactures, utilities, landowners, and consumers (see Figure 20).

Figure 20: Wind energy development value chain



Those close to the industry in West Texas are well aware of the complex value chains on which wind development relies:

> There's a [manufacturer] in Brownwood, right close [to] Coleman, that builds the internal steel works—ladders and platforms. And the areas that hold the monitoring and the login equipment and the electrical. They told me—the man who owned it—they put 14 tons of steel inside one of those General Electric towers. And then there's a place in Coleman that finishes the blades. The closest rolling mills for the towers are I think in Fort Worth. [And Zoltec in Abilene] does the carbon fiber stuff. That's quite an impressive facility there in Abilene (Interviewee 3, 2011).

Overall, the wind industry has had strong effects on the West Texas region. Many studies of the economic impacts resulting from renewable energy development rely on the Jobs and Economic Development Impact (JEDI) Models, created by the National Renewable Energy Laboratory (NREL) and based upon a set of unique industry production inputs and economic multipliers provided by the Minnesota IMPLAN Group. The JEDI model runs in Microsoft Excel using specific production inputs such as construction costs, equipment costs, annual operating and maintenance costs, and financing parameters, among others. The model then estimates project development and onsite labor impacts (direct), local revenue and supply chain impacts (indirect), as well as induced impacts.

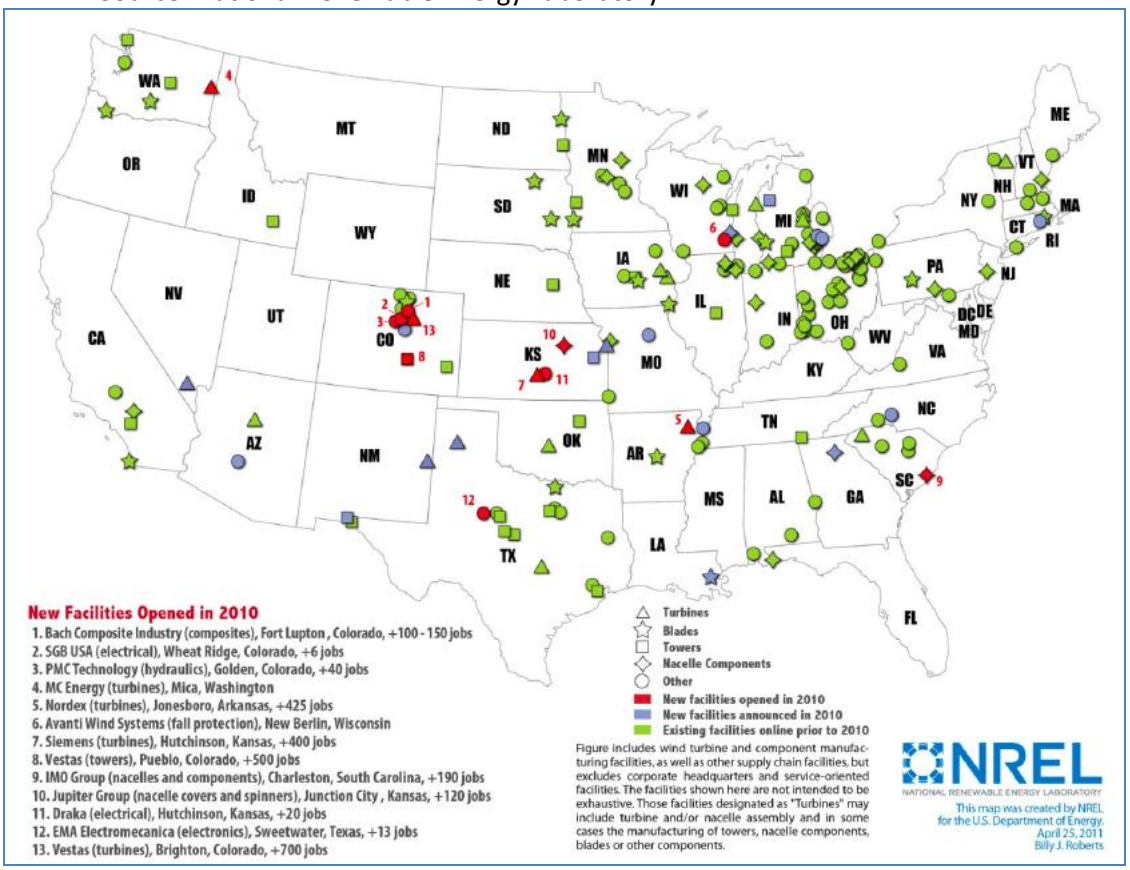
A JEDI wind model was used to estimate the purchases of goods and services associated with an 8,321 MW expansion of installed wind energy capacity in the State of Texas. The NREL estimates that an 8,321 MW wind farm built in 2012 cost a total of $16.6 billion and result in nearly $2.9 billion in regional

[29] Energy density describes how much land the development of a specific energy resource requires per unit of energy produced. Renewable energy sources as a rule yield less energy per unit of land by an order of magnitude or more in comparison to fossil fuels.

spending. Total annual operating expenses are estimated at $2.8 billion.[30] Because local policymakers are typically concerned with the economic impacts occurring *within* their state or particular region, regional rather than total purchases are used in the following estimates.[31] Using RIMS II multipliers, it is estimated that nearly $2.2 billion in regional purchases during the construction period of an additional 8,321 MW of wind energy development will result in approximately $3.5 billion in total output, $1.1 billion in earnings, and 24,917 jobs across the Texas economy.

While manufacturers of wind turbines installed in the U.S. hail from Europe, Japan, India, China, and South Korea, among others, General Electric was the number one manufacturer of wind turbines supplying the nation in 2010. In 2010, GE General Electric supplied the U.S. market with 50 percent of turbine installations and had a 9.6 percent market share globally (DOE, 2011, p.18-19). The U.S. Department of Energy and American Wind Energy Association both report a continuing trend of increased domestic turbine and component manufacturing, as well as a proliferation of assembly facilities. A map produced by the National Renewable Energy Laboratory (Map 8) shows locations of 13 manufacturing facilities that opened in 2010, 18 new announced facilities, and over 150 facilities open prior to 2010.

Map 8: Wind manufacturing facilities in the United States
Source: National Renewable Energy Laboratory



[30] Estimates assume a total of 4,161 installed turbines, each with a size of 2,000 KW.
[31] The entire State of Texas is used as the region of analysis for the purposes of this study. In addition, local share percentages are estimated at the national level by the NREL and thus do not reflect spending patterns specific to Texas.

Accompanying the growth in U.S. wind capacity has been an increase in the share of turbines and turbine components that are domestically manufactured. Analysis of trade data conducted by the U.S. Department of Commerce highlight a trend in which "wind power capacity additions have outpaced equipment imports, yielding a growing share of domestic manufacturing content" (DOE, 2011, p.25).

And as the industry has expanded its footprint across West Texas, the region has developed important comparative advantages for wind-related manufacturing. Economic geography has played a critical role in firm location decisions and the development of supply chains. One Texas interviewee identified specific examples of firms that re-located to the area to take advantage of market proximity. Large firms like General Electric have begun to realize that attractiveness of locating its facilities in West Texas as many of the turbines they produce end up there. As one economic development practitioner recalls, "[General Electric] started looking and [they said], 'Almost all our turbines are coming here.' So we have the only GE wind center in the United States because at any what time [they] monitor as much as 800 MW of power."[32] The same interviewee noted that adequate infrastructure and cooperative landowners are also factors in some manufacturer's decisions:

> …we actually brought a company from Argentina that is manufacturing some components that go into the wind business, here in Sweetwater now because it was the right place to be in the United States market… The companies were looking and said, 'You know, Sweetwater is a good place, Nolan County, West Texas, they're a good group of people. They have the services we need, willing landowners, and…why not?' (Interviewee 2, 2011).

Rural West Texas not only depends on the products and markets from urban areas in Texas and around the United States, but these areas also depend on the same rural communities for the energy produced. Dabson (2007) has framed this interdependence as a series of contributions that rural and metropolitan regions make toward each other's overall prosperity.

5.5 Building Rural Wealth

The Wealth Creation in Rural Communities (WCRC) initiative[33] has adopted a "community capital" framework for targeting and measuring the impacts of economic development policies and programs. An approach that transcends the traditional focus on economic and financial wealth, as WCRC suggests, "is more likely to create rural livelihoods that are sustainable over the long term, and more likely to benefit the many rather than the few."

Financial Capital

Financial capital is made up of the monetary assets belonging to an individual, household, or community. Interviews with landowners, industry representatives, and municipal officials illuminate the accumulation of several forms of financial capital generated by wind development, some more elusive than others. In addition to jobs created directly and indirectly through wind energy development, the industry also provides new tax revenue for states and municipalities, as well as income to landowners hosting a wind turbine or transmission tower (Slattery et al. 2011).

[32] Interviewee 2
[33] See http://www.creatingruralwealth.org/.

Property Tax

Required to pay property taxes on leased land, wind developers are providing new revenue to counties, municipalities, and school districts across West Texas. While some early developments paid property taxes in full, many developers now receive abatements. In Nolan County, for instance, the market value of wind farms grew from a total value of almost nothing in 2001 to $1.9 billion in 2009, while tax abatement agreements put the taxable value at about $831 million (Adame 2011). A county judge recalls the exponential growth in the county's tax base over the last decade,

> When I first took office, which was January 1, 1999, our entire tax base for the county was just slightly over $500 million. And for 2011, before abatements, it's $3,051,106,130—that's the total market value. The total assessed value is $2,630,868,000. And after abatement our total taxable property is $1,599,118,880. So you can see that that's quite an increase.

While the property tax is no longer a significant source of revenue for most states, its contribution to local revenues can be significant (Bowman and Kearney 2006). In West Texas, landowners are benefiting from the wind industry's impact on property taxes:

> That [increased tax revenue] directly impacts everybody that is a landowner or owns any kind of property in Nolan County because all of a sudden your tax burden's been decreased because the valuations are so much higher. The tax that they need to put on that to collect a certain amount of money to run the county was lowered (Interviewee 2, 2011).

On the other hand, one interviewee reported a tighter rental market as a result of the influx of construction workers in counties experiencing wind development. Compared to state and national levels, however, ownership is a more common form of tenure than renting in many West Texas counties. In Nolan County, for instance, 68.4 percent of households were owner occupied in 2010, compared to 63.7 percent in Texas and 65.1 percent nationally.[34]

Sales Tax

Wind development not only results in increased property tax revenues, but indirectly affects the amount of sales tax collected as well. A study by New Amsterdam Wind Source, LLC, a consulting firm in Nolan County,[35] reports that sales tax revenue in the City of Sweetwater increased 40 percent from 2000-2007, a period of significant wind development in the area (WTWEC, 2008). According to the report, this additional revenue is partially owed to "substantial new retail operations and dining options [that] have opened in Sweetwater…since 2004," ostensibly a result of the influx of wind industry employees during this time. The authors go on to predict that "intensified industrial service operations will add additional momentum to local sales tax revenues in the near future" (WTWEC, 2008, 15). Local municipal officials confirm the rise in sales tax revenue and attribute it to new retail and hotel development stemming from an influx of wind industry employees:

> …our sales tax has increased greatly…we've already collected $725,000 this year and we still have three months to go so we're only 75 percent of the way. So we'll more than double what it was less than 20 years ago. And a lot of that is not just wind based but it's just a progression of retail on Interstate 20, the Wal-Mart coming in. Now with the wind we have three brand new hotels we didn't have before wind.

[34] 2010 Census, U.S. Census Bureau

[35] Disclosure: Gregory L. Wortham, current mayor of Sweetwater, is the president of New Amsterdam Wind Source, LLC.

In several West Texas cities, interviewees commented on the positive impact tax revenues have had on local schools. In fact, one landowner feels the local school systems are "one of the biggest beneficiaries"[36] of increased revenues. He says, in "the Roscoe school district, until the Roscoe wind farm arrived, the tax base was like $65 million. And Roscoe was a poor school district…very small tax base. The peak of the valuation from the wind farm and the land peaked at $365 million."

Increased funding for schools has been manifested in real improvements to school facilities and curriculums, which has in turn improved the quality of education provided to many local students. For example,

> Roscoe built over half of a new school in their first year…they went online with this early college program [and] they had a senior girl graduate with an associate's degree one week before she got her high school diploma. So that was the step and they're doing a great job. Highland School District is rebuilding about 50 percent of their school. Blackwell School District built a $12 million school for about 100 kids. Trent School District has done the same thing; built a brand new school (Interviewee 2, 2011).

Other school districts, like the one is Blackwell, TX, have brokered lucrative deals with wind energy developers in order to secure financing for a new football stadium, scholarship money, and iPads for students, among other things.[37]

> In the past, local school districts in Texas were able to keep whatever revenue they earned, meaning wealthy suburban and rural districts would spend much more per pupil than inner-city districts around the state. Today, local tax revenue is collected and then redistributed by the state according to a specific apportionment formula.[38] While this has leveled the playing field in terms of educational spending across Texas, local school systems are still permitted to use tax revenue for important capital improvements and debt servicing. As a county tax assessor remarks, "What it's done is it's allowed schools to build new because they can take on a debt knowing that they get full value at the debt rate…it's allowed them to keep quite a bit of it and build new schools and do things like that."

[36] Interviewee 3
[37] See Smith (2011).
[38] In 1992 the State of Texas, then under Governor Ann Richards, launched the "Robin Hood Plan," which requires wealthier school districts to remit property taxes to the state, which are then redistributed to poorer districts (Texas State Historical Association, http://www.tshaonline.org/handbook/online/articles/fri62).

Landowner Income

In addition to creating jobs and increasing local tax revenues, the development of new wind generation provides lease income to landowners hosting electrical transmission towers, and both lease and royalty income to those with actual turbines on their property. This type of compensation is common with many forms of energy production, and lease terms are increasingly negotiated by landowner coalitions, especially in the case of natural gas production (Jacquet, 2011). Generally, a wind developer will approach landowners living in an area under consideration and draw up lease terms. The developer will typically offer a one-time signing payment, in addition to guaranteed production royalties that are based on the amount of electricity generated by any turbines on the property during the term of the lease, and "…then [compensation for] damages for the roads and pads and anything else that's used," according to one landowner.

There is also anecdotal evidence that landowner payments have become more consistent as development has become prolific across parts of West Texas:

> [Landowners] receive a signing bonus, and all of these situations are negotiable so it's different all the way across the wind belt. But the industry is beginning to settle down and arrive at a standard, more or less. And it varies across the nation. (Interviewee 3, 2011).

Lease arrangements vary, with some landowners agreeing to individual leases while others opt into shared arrangements. Shared (or co-opted) arrangements, whereby compensation is distributed equally among participants, are often designed to prevent competition between neighboring landowners. One interviewee recounted his experience:

> …the royalties is based on a percent of the gross sales of electricity off of either your property if it's a co-opted deal. So you've got one windmill and there's a hundred windmills out there—or 1 MW and there's 100 MW—you get one percent of the total. If your one windmill breaks down you're not sitting there watching everybody else make money. Now there are some wind farms that are set up like that. You only receive a percent of the electricity generated on your farm. [There are] many different arrangements here.
>
> We had voted ourselves a dollar an acre assessment because we wanted to negotiate as one entity. We didn't want our neighbors competing against each other [for] contracts. We didn't want different deals with different individuals because boy, you talk about causing conflict in the community. When one guy's got more, a better deal than anybody else, you just do not want that. (Interviewee 3, 2011)

Estimates of annual royalty payments from wind development range from nearly $12.3 million in 2008 (Adame 2011) to over $17 million by late 2009 (WTWEC 2008). Payments to individual landowners are difficult to pinpoint, but one industry advocate from Nolan County feels payments are not excessive, "…probably the average income is $15-20,000, [maybe] $25,000 a year per landowner that has a windmill on 'em." He feels that there's "no concentration of income" because so many tracts of land are leased and the benefits are thus distributed among many landowners. Of course, those who do not own farmland in West Texas do not benefit directly from lease and royalty payments.

Employment and Wages

Wind development, while capital-intensive relative to other forms of energy production, has job creation potential, especially during the construction phase of a project. After a wind farm is constructed, however, relatively few positions are required in operation and maintenance. While new

jobs are highly desired in struggling regions like West Texas, wind development clearly results in a boom phenomenon and resulting economic fluctuations, as illustrated by the following account:

> …in a very short amount of time, by the middle of 2008, we had over 1,000 people in Nolan County working on building wind … We were down in the low 4 percent [unemployment range]. [Experts] said just with the turnover in jobs and those that choose not to work, if you're down to 4 you can't find anybody to work. And we got to that point where it was hard to find someone to go to work, some of the jobs that used to start out at $7 or $8 an hour all the sudden had to pay $9, $10, $11 an hour because it was costing you more to get the bodies that you needed. (Interviewee 2, 2011)

Positions that do remain after a wind farm has been constructed, while fewer than those supported during the construction phase, are often "direct jobs tied just to the industry itself" (Interviewee 2, 2011) and, unlike construction jobs, are permanent. The types of jobs vary, but most are related to maintaining and servicing the wind turbines themselves. As mentioned previously, General Electric located a large maintenance facility in Nolan County to take advantage of the rapid development, and has hired technicians from the local labor market. (Interviewee 4, 2011)

While the economic boom experienced with wind development is similar to that in the case of natural gas or oil extraction, some farmers have noticed that wind production is less volatile than conventional forms of energy production over the long-run. This is likely a result of a relatively stable wholesale electricity market in Texas, but the stability of wind development could be undermined by changes in policy direction.

Spillover Financial Effects

Even businesses that are unrelated to wind experience increased business, especially during booming construction periods. Interestingly, the influx of employees has also led to rising wages across the local economy in some places. One economic development practitioner explains the phenomenon as follows:

> We're only a county that had 6,200-6,300 people, and 1,000 of 'em are working in one industry that's brand new… You had people that would go out there and do nothing but pick up trash as they were constructing these [wind farms] and start out at $15 an hour.
>
> So your hotel industry, your janitorial industry, was struggling because that is an area that normally pays lower in a community and it's probably a $7, $8, $9 job; all of a sudden they had to increase it because of that.
>
> Some of our manufacturing—I've got a friend that worked at United States Gypsum for 20 years and that was probably the best paying blue-collar job in our community that left that to go work for the wind industry because they could make more money and travel all over the United States and do a lot of things like that.

Indeed, in tight markets it is not uncommon for businesses to respond to a labor shortage by raising wages across the board. This shift can be troublesome, however, if it is based on an artificial shortage caused by temporary employment, as is the case in counties dependent on new wind development.

Built Capital

Schools and municipal building improvements, like the remodeled courthouse in Sweetwater[39], were the most frequently cited examples of growing physical wealth in interviews and news reports. Many of the interviewees described the new construction in their community with pride and delight. They have witnessed how built capital fosters investment in other forms of capital, such as intellectual capital in the schools:

> And you can also see what the wind industry's done for all the other schools in the county…other rural schools in the county. Highland down here about five miles…they're getting a new facility. Blackwell is at the southeast corner of the county and they're getting a brand new school facility. North of us is Hermleigh, right up 84…they're getting a new school facility. So that gives you an idea of the educational benefits. (Interviewee 3 2011)

While some benefits are difficult to notice, new building and infrastructure construction can provide one of the most visible signs of wind development's impact on the West Texas region, as one resident attests to: "I've seen the change, and I get to see the new hotels being built and the businesses coming in and I actually get to see the amount of value change…I think it's been very beneficial to the entire community."

Natural Capital

Examples indicating both the accrual and depletion of natural and physical wealth were alluded to in many interviews. A community's landscape, natural resources, and plants and animals constitute its stock of natural capital, while built capital describes the schools, roads, and buildings that contribute to building other forms of capital.

The most fervent debate in Texas has stemmed from planned transmission lines that would cross a region colloquially known as Hill Country, a Central Texas region described fondly by one interviewee as "a recreational area, it's a sporting area. It's been settled since the 1840s. It's rugged hills, lots of valleys, lots of streams of creeks. It's a very special place." While the boundaries of Hill Country are indefinite, the area is easily distinguishable from West Texas by most Texans, particularly by its higher land values and natural features.

At issue is the fact that electricity generated in the rural communities of West Texas must be transmitted east to urban areas like Austin, San Antonio, and Dallas-Fort Worth. Wind generation is concentrated in West Texas with load growth is concentrated to the east and

[39] See Kraus (2011).

southeast, and Hill Country as the open expanse in the middle. In Hill Country, residents often see the turbines as a source of "eye pollution"(Interviewee 2, 2011).

While coalitions from Hill Country have already had success in forcing the Texas Public Utility Commission to reroute a controversial transmission line that was planned to bisect sacred lands,[40] future skirmishes are inevitable as Texas continues its massive transmission build out, and a better understanding of a community's stock of natural capital will help to weigh the costs and benefits of such development.

Individual and Intellectual Capital

Forms of human and intellectual capital—or the capital invested in people—are also critical to the sustenance of healthy communities. Intellectual capital is generally distinguished from individual or human capital using measures of innovation and knowledge creation. Within the management literature, where the term is perhaps most frequently used, the intellectual capital belonging to a person or organization is regarded as that person or organization's ability to innovate, or, more specifically, "its ability to utilize knowledge resources" (Subramaniam & Youndt, 2005). The wealth creation approach defines intellectual capital in a similar way: Intellectual capital is the stock of knowledge and innovation in a region, embodied not in individual minds—as individual capital is—but instead in the enduring intellectual products those minds have created (WCRC, n.d.).

Of course, as indicated previously, local schools were repeatedly cherished as the key to reviving West Texas communities and maintaining the intellectual and human capital that seems to be missing. Schools, as an interviewee commented, "[are] the heart of the community. Once the school's gone the community just dies."

One of the most visible signs of knowledge building can be found at area technical colleges and workforce training programs. In a region dominated by a very limited number of industries, colleges are working to meet the wind industry's workforce needs and close the knowledge gap:

> The Texas State Technical College saw a need and in a very short amount of time put together a state-of-the-art program. In fact they're one of only three approved training facilities for AWEA (American Wind Energy Association). So they got out in front of it; they actually help other colleges. (Interviewee 2, 2011)

By building the skillsets in a region, firms can capitalize on local talent and promote the kind of long-term employment than contributes to a more stable economy. Intellectual capital building also takes place within organizations, as stories from the wind industry indicate. In such a nascent industry, wind technicians and mechanics are developing the types of skills and knowledge sets that allow them to provide their expertise in other parts of the country:

> The infancy of the wind business is so new, you have guys that have been in it for five, six, seven years are experts because they've been in it for longer than anybody else. Well, some of [the] guys are working all over the country from this office because they have more experience than anybody else in their system does (Interviewee 2, 2011).

[40] See http://www.texastribune.org/texas-energy/energy/controversial-hill-country-power-lines-canned/.

Importantly, the wind industry is providing some permanent jobs and is, in turn, keeping young people in the area or attracting them back. One rancher bemoans the continuing population loss of "our best and brightest" in and around Roscoe, TX, and remarks that the wind industry has been "kind of a double blessing" that is creating jobs and bringing young people back to rural Texas.

Depopulation was indeed a serious concern among many interviewees. One interviewee suggested that West Texans weren't concerned enough, asking things like "why aren't they alarmed that we're 500 people down since the census from ten years ago?" His frustration seemed to be targeted toward public officials in some cases, suggesting that efforts to preserve the wealth in their community were not strong enough:

> …to me I think it would make sense if we spent some money to improve the quality of life here which would make it easier to attract businesses and industry here. And then we have an improved quality of life. [Downtown revitalization], that's the kind of stuff…that we're hurtin' for. Programs for the kids, summer activities…there's nothin' here, except what I do.

Another source of intellectual capital in the region is the entrepreneurial spirit sparked by the burgeoning wind industry, as Texans recognize important business opportunities:

> I used to work for the electric utility here, Texas Utilities, and two people that I hired when I was manager for them, left TU and started a business of their own. They have a couple more partners but they're the main ones. And they have a very, very active repair business for wind generation. And that's just one small example but we have a lot of inhabitants of the county that were provided jobs due to the wind generators. (Interviewee 4, 2011)

> [Aside from operation and maintenance (O&M) work], there is quality control; we're still in warranty work…most of these windmills are still in warranty. There's of course electrician, computer, [and] office work. They have to monitor each one of these projects. Even pilot car companies, local people, that have set up pilot car companies that for these big components of the wind industry that have to go up and down the roads. They have to have a pilot car in front of them…with the flashing lights and the warnings because they're over-wide, overloaded. Those kind of things. And a lot of those are local companies that just sprang up as the demand [went up]. (Interviewee 3, 2011)

> We had companies that got in on the ground floor with some of these wind companies. Good friend of ours that owns CGS Graphics, he started making signs and decals and things like that for the companies. Well, as these men would move to another location they said, 'I'm just going to order all my stuff from Russ because I'm used to having him do it.' So even though the volume decreased in our Nolan County area, his volume didn't decrease because of the relationships that he had built with some of these other individuals. (Interviewee 2, 2011)

Dabson (2001, p.35) has argued that this same spirit, when harnessed, can actually tackle deep-rooted economic problems in rural communities and should be given "greater recognition as a means to revitalize rural America." There is a certain ethos in West Texas that is difficult to deny, as onlookers watch how the industry "just grows and grows." What is less clear, however, is how this momentum will be maintained.

Community and Regional Inequities

Wind development has led to a multitude of benefits in rural, West Texas communities, but it is important to ask: Who is losing out in this process? A deeper analysis reveals that this rapid influx of investment, or capital, has in many ways reinforced existing social and economic structures, systematically promoting the interests of those who control society's productive capital.

It is clear that individual landowners are most likely to benefit in rural communities where the production of electricity is taking place. Farmers and ranchers hosting wind turbines own a critical element of productive capital—land—that contributes to a cycle of wealth accumulation and inequality within society. As long as the production of wind energy takes place on their property, their interests are effectively promoted over the interests of the non-landowning.

Interestingly, evidence to support this notion is most observable in local debates over economic development policy. The most commonly practiced economic development policies in rural West Texas communities generally include the use of business incentives to attract and retain firms. The prevailing belief among "wind welcomers" (Brannstrom, Jepson & Persons, 2011) is that wind development has had an extremely positive impact on the West Texas economy and that tax abatements are "important to foment wind-energy development."

This strategy has garnered support among many, but others say generous tax abatements represent, at best, a form of "corporate welfare" (Interviewee , 2011). One point of contention stems from the types of projects that economic development monies may be used for in Texas. One local business owner expresses the difficulty he faces in securing financial assistance under a structure that favors more conventional, industrial economic development:

> The real rub on the economic development thing is that we have two structures: 4A and 4B in economic development. Well 4A is what we have here; it allows you to do industrial development, it's essentially created jobs…building jobs. Which is great, everybody loves jobs. But the 4B projects allow you to reinvest in infrastructure. It would help me. Then I could get some money and fix my roof, which leaks. I struggle, struggle, struggle, and they go give a bunch of money to some out-of-town guy… I didn't [receive] nothin' to open this [café]…yet I grew up here.

Brannstrom, Jepson & Peters (2011) also document growing disenchantment with tax abatements among some community members. While some are concerned that local governments will eventually lack the funds necessary to make critical infrastructure improvements if tax abatements continue in earnest, others argue that the benefits of wind development would be more widely distributed if incentives were discontinued: "If they didn't have the tax abatements, then [wind energy firms] wouldn't be paying those landowners so much… Now if the companies had to pay taxes, the whole community would benefit, not just the people out there that are getting wealthy" (Brannstrom, Jepson & Peters, 2011, p.847).

Local officials and wind boosters acknowledge that "There always is [criticism] with any kind of abatement," and "There's probably not gonna be 100 percent of people in the county that agree with [the tax abatements]," but there is a belief that economic development policy has, "for the common good, it has helped them."

5.6 Conclusions

West Texas, a struggling and depopulating region, may be gaining a second wind, quite literally. The rapid development of wind energy across the region has contributed to economic growth, but has also had a pervasive impact on local communities. The extent to which wealth being generated by rapid wind energy development in West Texas has remained in and benefited rural communities ultimately depends on who you ask.

The wind industry has the potential to reinvigorate a depopulating region by offering employment opportunities for "young people to come back to." Indeed, proponents feel that the wind is "…bringing new blood [into the area] and this is [the] best thing that can happen to a rural community [when] nearly all of these young people that are coming back [and] staying here" (Interviewee 3, 2011).

Moreover, as many Texans observed severe economic decline in many parts of the country following the 2008 financial crisis, some felt that West Texas was able to persevere because of wind development: "We never had a decline in the market as far as our market values, our property. The rest of the country had an economic decline and we might have sort of hung in there but we didn't really decline" (Interviewee 5).

As Brannstrom, Jepson & Persons (2011, p.849) remind us, however, "the absence of resistance to wind-energy development does not signify complete acceptance," and underrepresented population groups to exist that may be excluded from the benefits derived from this industry. A successful and sustainable regional economy will only be realized through policies that foster economic competitiveness while concurrently providing social equity.

As development continues, important questions over the redistribution of wealth are bound to emerge. A rising tide will only lift all boats if the needs of those likely to lose out—be it the uneducated, landless, or small business-owning—are not addressed. Given the influx of new employees and their families, state and local policies that help small businesses and improve the quality of life in rural West Texas communities will improve the region's ability to attract firms and their investment, while also helping to shelter the region from economic volatility.

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Section 6
Commentary

Brian Dabson

6.1 Commentary

The wealth creation framework as developed by the *Wealth Creation in Rural Communities* initiative is intended to provide a new approach to rural development. The framework has four features that distinguish it from conventional approaches:

- It takes a systems view of rural development both in terms of how producers, processors, distributors, marketers, and consumers are connected, and how rural and urban communities connect within their regions.
- It takes a long-term view of development, with an emphasis on investment and reinvestment in community and regional assets.
- It places a premium on the retention and enhancement of rural assets over which local people and communities have control and ownership.
- It emphasizes collaboration for mutual benefit through value chains where economic, social, and environmental goals are shared to meet market needs in new ways.

The framework is based on a set of four principles that guide this new rural development approach:

- There is a focus on place, where local assets form the basis of development, where local experience and values are respected, and where priority is given to the expansion of local community and individual capacity. It also implies connecting local people and communities to ideas, markets, and partners in other places and markets.
- There are incentives for collaboration, encouraging people and businesses to work together within their communities and regions, and linking rural producers to markets through value chains in ways that generate wealth for rural places.
- Wealth is seen as not only as the generation of financial capital, but also natural, social, individual, built, intellectual, and political capital, in ways that growth in one form of capital does not come at the expense of other capitals.
- There is local ownership and control over rural assets that limit external exploitation and shifts the balance of power over their stewardship and use.

None of the efforts described in the four case studies were intentionally designed to comply with these principles. But it is useful to assess the extent to which the cases reflect them – not to hold the cases to account but to inform a broader discussion about the application of the wealth creation framework.

What follows is a set of summative impressions of the cases using seven questions derived both from the wealth creation framework and from the initial lines of inquiry developed for the case studies:

1. How important is “place”? To what extent is there local ownership or control over rural assets?
2. To what extent is wealth recognized in its multiple forms?
3. Do the cases offer insights into ways stronger rural-urban linkages can be forged?
4. What do the cases say about value chains?
5. Has the long-view of development prevailed?
6. How replicable are the cases?
7. Do the cases provide useful perspectives on the overall wealth creation framework?

1. **How important is "place"? To what extent is there local ownership and control over rural assets?**

   The idea of place manifests itself in different ways in the case studies. In Oregon, place is reflected in geographical terms, specifically the Eastside forestlands defined by the topography and climate; in historical, economic, and cultural terms where the rural-urban divide permeates political discourse; and by the harsh realities of failing economies in small rural communities impacted by dramatic changes in forest management. Overall, the sense of place is inextricably linked to the forests, but 60 percent of the state's forestlands are owned by the Federal government, and a further 20 percent by corporate interests. Historically, there has been little effective local control over rural resources in Oregon, but as described in the case study, there are some promising signs of change.

   Forged by history, culture, geography, and catastrophe, New Orleans has a sense of place that few cities can match. There is a shared experience across the region that encompasses parts of Louisiana, Mississippi, and Alabama. Much of the region is rural, but as the case study shows, there is also a cultural divide that separates New Orleans from its hinterland, which Market Umbrella has had to work hard to bridge. Maintaining a diverse population of smaller-scale farmers and fishers is important to the region, where unemployment and poverty are a major challenge. Local and regional food systems, like the one encouraged by Market Umbrella, help small-scale landowners maintain and steward their resources while earning a living from their land. For rural farmers and fishers to succeed, they need the new markets and opportunities provided by their urban neighbors.

   Place has importance at two levels in the Nebraska case study. The city of Blair, the home of the Cargill biorefinery campus, has a history of volunteerism and corporate responsibility that underpins its strong civic infrastructure, or social capital. There is a sense of mutuality between the city and Cargill. The five surrounding counties that span the Nebraska-Iowa border are where most of the corn used at the biorefinery is grown – corn has become very much part of the identity of this part of the Midwest. However, the case study does not explore the nature of the contractual relationships between the producers and the processors and the extent to which Cargill dictates prices and production methods.

   West Texas is a vast rural region that has commonality in terms of its suitability for wind power generation. The importance of place is evident at the local jurisdictional level where county officials and landowners have been able to negotiate mutually beneficial arrangements with developers for the location of turbines and transmission towers. The return for some communities in the form of school buildings and other investments has had a profound impact on local economies and quality of life. Of particular interest are the temporary landowner coalitions that have been formed to achieve some measure of fairness and consistency in negotiations with developers – once they have served their purpose, these coalitions are dissolved.

2. **To what extent is wealth recognized in its multiple forms?**

   The Oregon case study uses the seven forms of wealth as the basis for describing the transition from the old extraction paradigm to the new restoration paradigm. On the ground, the transition has been slow and painful with economic and environmental interests pitted against each other with community interests – the social, individual, and intellectual assets – caught in between and depreciating. The new forms of collaborative management of federally-owned forestlands appear to represent an approach where several forms of wealth are being balanced for the long-term sustainability of the forests, the producers, and the communities.

The focus of the New Orleans case study has been primarily on social, individual, and intellectual capital – an intentional strategy of Market Umbrella. Although the case study discusses financial capital, probably a more accurate description would be support for livelihoods as there is no reference to the accumulation of savings for future investment. One of the challenges Market Umbrella and the regional food system have faced relates to political capital. Constant regulatory struggle appears to have been a major hindrance to the further development of Market Umbrella's activities. The organization has built its political capital with nearly 20 years of hard work in the city, and within the last year they have focused major efforts to improve the policies of the city and state that affect them. It remains to be seen if these efforts will bear fruit, but Market Umbrella's positive relationships with the city, in particular, bode well for improvement in this area.

The NatureWorks plant and the biorefinery campus of which it is part would seem to have measurable impact along multiple dimensions of wealth. One of the aspects not fully explored in the case study relates to natural capital. The globally significant environmental benefits of converting renewable corn into biodegradable and recyclable plastics, as well as being able to demonstrate superiority over petroleum-based equivalents in term of energy use and carbon footprint, could be game-changing for some rural regions. But what was not discussed were the local impacts on the natural capital of the five corn-producing counties, specifically on water quality and biodiversity resulting from monocultural operations and the use of pesticides and fertilizers. Overall the net environmental impact may be positive, but the question arises as to the net impact at the local level.

The rapid expansion of wind energy production in West Texas is a remarkable success story. The case study documents positive impacts on many forms of wealth, particularly financial, built, individual and intellectual capital. However, there remain concerns about environmental and social impact. Controversy over the aesthetics of turbine towers and particularly the routes of transmission lines through sensitive landscapes has led to push-back, and the distribution of the benefits of wind energy in favor of landowners and tax abatements for developers has given rise to discussions about fairness.

3. Do the cases offer insights into ways stronger rural-urban linkages can be forged?

The availability of recent research about the nature and strength of rural-urban linkages in Oregon provides some useful insights. As previously intimated in 1 above, the relationship can be characterized as one of both interdependence and tension, and has economic, social, historic, cultural and geographical dimensions. It has been suggested that Portland's success is due at least in part to its special relationship with the great outdoors and its strong commitment to localism and sustainability. In other words, Portland depends on having a healthy rural hinterland. The restoration forest sector is seeking to strengthen rural-urban economic connections through market differentiation and direct marketing both aimed at urban consumers willing to pay a price premium for sustainably harvested products.

For Market Umbrella the building of a sustainable regional economy that brought together rural and urban areas and economies was one of the founding purposes. One illustration of this interaction is the fact that producers of goods sold at the farmers' markets in New Orleans travel on average over 70 miles from rural communities in three states. Over time this had led to mutually beneficial and direct relationships between rural producers and urban restaurants. What is particularly interesting about this case study, based on experience in other parts of the country, is the potential waiting to

be tapped that would reinforce and significantly expand rural-urban linkages, such as institutional purchasing of local foods by institutions such as hospitals, schools, and hotels.

The regional dimension is particularly important in the NatureWorks case study. Blair and its county although rural are part of and clearly benefit from being part of the Greater Omaha region. The location of the biorefinery campus affords both easy access to its corn feedstock and to the airport and city amenities and services. It is also true that the economic connections that NatureWorks has developed are far wider than the immediate region and extend to national and global markets.

West Texas provides a good example of the complexity of rural-urban interdependence. Wind energy is produced mainly in remote rural areas, but the components needed for the construction and operation of the generation facilities are made or distributed from urban centers. Construction and maintenance provide jobs and tax revenues for local residents and communities and also temporary work for urban labor, and the main consumers of the energy produced are predominantly in the metropolitan regions of Texas and nationwide. Another potential linkage might be between urban consumers who care about the potential impact of transmission lines on the Hill Country and the tribes and other groups seeking to reroute such lines away from environmentally sensitive areas.

4. What do the cases say about value chains?

The term "value chains" has meaning in business circles that refers to the process of adding value to a product as it proceeds from sourcing, through production to marketing. The *Wealth Creation in Rural Communities* extends this much further with a number of exacting requirements. These include intentionality in measuring outcomes by the wealth created and retained, limiting externalities, ensuring mutual benefits for all participants in the chain, maximizing long-term benefits and widely-shared wealth, and focusing on consumer demand. None of the case studies meet all of these requirements but they do provide glimpses of what a wealth creation value chain might look like in the real world.

Sustainable Northwest provides a fine example of a value chain intermediary, facilitating the connections between producers, processers, buyers and consumers so that they all derive clear benefits from sustainably harvested woods. This has meant intervening in the forestlands to bring together landowners, timber companies, environmental interests, and local communities, so that they can jointly prepare forest management plans that protect the forests and provide jobs and income to rural people. It has required strengthening local businesses that use sustainably harvested wood so that they can access markets and remain financially viable over the long-term. Sustainable Northwest formed a private company to operate a lumber yard so that it could be a direct player in the market connecting producers to consumers, and worked with the creation of a nonprofit to work with architects, builders, and developers to generate further demand. Additionally, pursuing policy initiatives that level the playing field for sustainable forestry has been a collaborative venture with other organizations across the region.

Other than brokering producer-to-farmers' markets connections, Market Umbrella is not focused on value chains. The local food system is still in an emergent form with many of the public-private relationships awaiting development. That said, the organization's intentionality in making the public markets attractive to vendors and customers alike, as well as in developing tools for measuring

economic and social impacts of these markets, positions it well to extend its role to mapping the value chain and determining strategically where it could intervene.

The NatureWorks case study describes the business approach to value chains, as measurable value is added at each stage from the corn feedstock through primary and secondary processing within the Cargill biorefinery and then onto the production of Ingeo products, and out to the global marketplace. There is no question that this is market opportunity-driven corporate venture. A fully-fledged wealth creation value chain would extend this approach to the production of the corn crop (including the inputs such as seed, fertilizers, pesticides, water, and farm labor), the haulage and distribution of the feedstock and the final products, and the externalities of the biorefinery (including inputs of water and outputs in terms of waste). A further consideration might be the direct and indirect effects of the process on the competing uses for agricultural land, specifically for food, energy (ethanol, bio-diesel), or bio-based products.

The wind industry value chain in Texas is also a business value chain, but instead of a single corporate entity or nonprofit intermediary connecting the dots, there are multiple players acting in essentially an entrepreneurial fashion inside a loose regulatory and emerging market framework. Landowners, developers, manufacturers and distributors, local officials, and workers are at different times pursuing self-interest and sometimes a broader community purpose. At this point in what has been a very rapid development process, there are clearly many beneficiaries across rural Texas and evidence of enhanced wealth in terms of built and individual/intellectual assets. Whether the financial inflows will lead to long-term capital accumulation and whether the environmental impacts prove to be ultimately a depletion of natural assets remain questions to be answered. One of the obvious challenges will be availability of data and the appropriate metrics to capture these changes in rural wealth.

5. Has the long-view of development prevailed?

All four case studies describe long-term development efforts – they are certainly not quick-fix projects to solve some immediate or local problem. They represent the vanguard of activities that will almost certainly determine the direction for rural America for the next several decades.

The court order to cease harvesting of timber from public lands was a dramatic and pivotal moment that signaled the end of decades if not centuries of extractive practices in the forests. The emergence of the restoration economy in Oregon over the past 20 years has been slow but steady and will be take many more decades to take full effect. The application of sustainable forest management practices is by definition a long-term process, but the implications are immediate in their impact particularly on the livelihoods of rural people and the fiscal viability of rural communities. Taking the long-view clearly also means dealing with immediate, short-term challenges if the whole process is not to be derailed.

Market Umbrella also represents some 20 years of pioneering work towards a vision of a sustainable regional economy of which New Orleans is part. For many reasons progress has been slow but there can be seen solid accomplishments. The local food systems movement has been growing significantly across the nation but still represents a small fraction of the total U.S. food system, which itself has taken 50 years to develop its current characteristics of scale, concentration, consumer habits, and pricing. A major shift in the balance between global and local/regional food

chains will not take place overnight, and organizations like market Umbrella have no choice but to take the long-view to effect the change they seek.

NatureWorks is the result of nearly a quarter of a century of patient and substantial investment by Cargill. Replacing petroleum-based plastics with renewable bio-products is a long-term vision and it will be decades before it is able to claim significant market share – even the most optimistic forecasts see bio-products as achieving 17 percent of the global market by 2025.

The introduction of renewable energy portfolio standards in Texas just ten years ago spawned a wind energy industry that now represents a quarter of U.S. capacity. But total wind energy production still only supplies one percent of the nation's electricity, and will require massive expansion to meet the U.S. Department of Energy target of 20 percent by 2030. To achieve such growth the question arises of how immediate environmental and equity issues will be resolved in rural west Texas.

6. How replicable are the cases?

Context has largely determined the nature and trajectory of the four cases, which means that direct replication is neither possible nor desirable. Nevertheless, there is much in the case studies that could be translated with benefit into other regions across rural America.

The context for Sustainable Northwest is shaped by Federal ownership and control over the majority of forestlands in Oregon and all that that entails in terms of community, economic, and environmental impact. There are equivalent organizations in other regions that are dealing with similar challenges in private and corporate forestlands, such as Northern Forest Center in upper New England and Rural Action in Appalachia. The policy efforts of Rural Voices for Conservation Coalition (RVCC) are mirrored by the Coalition for Eastern Forests and Communities. These and other organizations and initiatives are all interested in sustainable harvesting, connecting producers to consumers, expanding technologies and markets for biomass, and ensuring viable and healthy forest communities. The opportunity is less about replication of the Sustainable Northwest model but more about continual exchange between these types of organizations to encourage innovation in and effectiveness of policies, programs, and services.

There is much that is being learned in other regions by more highly developed local and regional food systems that could be usefully integrated into the Market Umbrella model. However, the measurement tools developed in New Orleans should have wide applicability, particularly when combined with economic impact assessments that have been used in Iowa and elsewhere.

The corporate model adopted in Nebraska, at least in terms of Ingeo production, is being replicated through a joint venture in Thailand using sugar cane or cassava as its feedstock. The growing interest in bio-based products is likely to spur other major investments from Cargill and similar large corporations as well as entrepreneurial ventures from smaller companies and universities. The strength of the connections between the company and the local community and the region achieved in Blair may provide some pointers to the way such developments might be structured elsewhere.

Renewable portfolio standards similar to those used in Texas have been adopted in 29 states, and it is conceivable that regions with the required topography and wind conditions could see economic benefits of the sort, if not necessarily on the same scale, achieved in Texas. The active engagement

of local elected officials and the use of temporary land owner coalitions may have a place in other contexts.

7. Do the cases provide useful perspectives on the overall wealth creation framework?

Unlike the four projects underway in Central Appalachia as part of the *Wealth Creation in Rural Communities* initiative, the four cases were not designed and implemented using the wealth creation framework.

The use of this framework as a lens through which to look at the accomplishments of the four cases, however, has proved to be a valuable discipline to see what else might be done to improve their impact and effectiveness. The framework:

- was used to articulate the shifts taking place from the extractive to the restorative economy (Oregon);
- enabled value to be credited to the efforts taken to build social capital in an area divided by racial tension, as well as to identify where there may be opportunities for further development (New Orleans);
- allowed additional questions to be asked about upstream impacts of bio-products manufacturing in the corn-producing counties (Nebraska); and
- enabled probing questions to be asked about who is winning and who is losing from the wind energy boom (Texas).

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