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Comprehensive Industrial Analysis the Paper Industry

UMass Amherst Center Economic Development

COMPREHENSIVE INDUSTRIAL ANALYSIS
THE PAPER INDUSTRY

WESTERN MASSACHUSETTS

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TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

For over one hundred years the paper industry has been a vital component of the Western Massachusetts economy. It has employed thousands of the region's residents, and contributed millions of dollars of revenue. It has been a fairly stable industry, despite its fluctuations over the years due to a variety of reasons including technological advances, and changes in demand, supply, and location of raw materials. Today the paper industry is still recognized as a vital component of the Western Massachusetts economy, but though it remains a strong industry it is beginning to show signs of decline.

Realizing that the paper industry is a vital component of the Western Massachusetts economy, the overall goal of this study was to identify action steps that would help to retain and expand the industry in the four Western Massachusetts counties that constitute the region of focus--Berkshire, Franklin, Hampshire, and Hampden.

Purposes

This study examined the paper industry in the four Western Massachusetts counties for the purposes of :

1. Identifying who and what makes up the paper industry in Western Massachusetts

2. Gaining an understanding of its impact on and importance to the region's economy, and
3. Providing some insight into the most appropriate areas of the industry toward which resources could be directed in order to maintain and expand the paper industry in this region.

Sponsor

The study was conducted for The Maurice A. Donahue Institute, an organization within the office of President of the University of Massachusetts. Founded in 1970, The Donahue Institute has a variety of goals and functions that include providing services to dislocated workers, contracting with University faculty to work with business and industry as consultants, collaborating with community colleges on training and education programs, and directly serving business and industry with management and organizational consulting. The Donahue Institute is committed to providing both employer and employee with the skills and services necessary to maintain a strong and stable economic base for Western Massachusetts. In short, The Donahue Institute is an organization committed to economic development.

In formulating the scope of the study it was necessary to identify a set of assumptions, goals (mentioned previously), objectives, and tasks. This was accomplished by the study team in conjunction with The Donahue Institute.

Assumptions

1. Identifying positive action steps to help retain and expand the paper industry in Western Massachusetts is necessary to ensure the continued vitality of this important component of the region's economy.

2. The creation of a public/private collaborative to guide the future of the region's paper industry is both desirable and possible.

3. The region's paper industry may be a "sleeping giant" that, if awakened, could provide an even larger and more stable economic base for the region than it currently does.

4. Working to retain and expand the region's paper industry is important to the people who live and work in Western Massachusetts.

Objectives

This study is intended to be the first step in establishing a collaborative, or partnership, between organizations in public and private sectors so as to work on behalf of the paper industry to maintain and expand it. The knowledge about the region's paper industry gained through this study will be used by The Donahue Institute to establish a credible basis upon which to approach the members of the paper industry and other potential players in the collaborative and to lay the foundation for its establishment. This study also identifies additional steps and areas of future study necessary to advance establishment of the collaborative.

More specifically, the objectives for this study are:

1. To identify and examine trends about the paper industry on national and statewide levels, but primarily in Western Massachusetts.

2. To gain an understanding of the paper industry's impact on and importance to the region's economy.

3. To provide insight into the most appropriate areas of the paper industry toward which to direct resources to retain and expand the paper industry.

4. To provide the sponsor with a credible basis from which to pursue developing a collaborative.

5. To identify appropriate areas for future study to continue working toward the goal of establishing a collaborative.

<u>Tasks</u>

The following tasks were identified as means for achieving the study's objectives:

1. Sharpen the sponsor's preliminary statement of the research focus.

2. Conduct an inventory of the Western Massachusetts paper industry, including identifying and examining trends.

3. Assess the general benefits and demands of the paper industry on the regional economy, and identifying major planning issues and obstacles to economic development and business activity.

4. Conduct case studies of several regional paper industries to identify specific concerns of sample firms in the region.

5. Provide our sponsor with a package of resources it can use to continue efforts toward establishing a public/private collaborative whose goal is to retain and expand the paper industry in Western Massachusetts.

6. Make recommendations to guide next steps toward the collaborative, and for areas of future study.

The first task--helping the sponsor sharpen the focus of the study--*defines* the study. The remaining tasks describe the *elements* of the study; what the study is looking for and how it is to be accomplished.

Defining the Study

Because this study was the first step in a multi-step process to establish a collaborative, there was no previous research and little information available to focus and guide it. Subsequently, helping the sponsor sharpen the focus of the preliminary statement of concern was a difficult and lengthy process, but one that was also challenging and exciting. During the introductory meetings between the study team and The Donahue Institute it became clear that the paper industry, both historically and currently, plays a big role in the Western Massachusetts economy, but exactly how big a role was unclear. It was also clear that the Institute had a desire to take steps to ensure the paper industry's continued vitality in the region, although these steps had not yet been identified. Finally, and possibly most important to designing the framework of the study, it was determined that the study would initially be conducted "at arms length", meaning that the study team would not contact the paper companies directly for information until sometime in the second half of the semester.

The reason for this approach was that attempting to get inside an industry is a very sensitive process, even if the purpose is to help that industry. The paper companies had not yet been notified of this or possible future studies, and it was felt that directly contacting the companies in the absence of a formal notification might create an uncomfortable situation that could jeopardize any attempt at establishing a collaborative in the future. However, a meeting hosted by the Associated Industries of Massachusetts (AIM) and United States Representative John Olver to inform the members of the industry of the study was scheduled for late October, and direct contact between the study team and the industry could commence following the meeting.

The Role of the Study Team

Thus, with this "big picture" in mind the study team's challenge was to identify its part of the "big picture" and establish a framework for the study while considering the different players and their agendas, the desires of the sponsor, and the decided protocol for conducting the study.

The role of the study team was to act essentially as filters. The team took information from the various players in the form of facts, ideas, and concerns that helped identify what the paper industry is and what contribution the players could make to retain and expand the industry. The information gathered also identified additional promising steps toward the collaborative. Figure 1 illustrates this role of the study team as "filters" and the process of defining the scope, while Figure 2 illustrates the actual scope.

FIGURE 2:
SCOPE OF THE STUDY

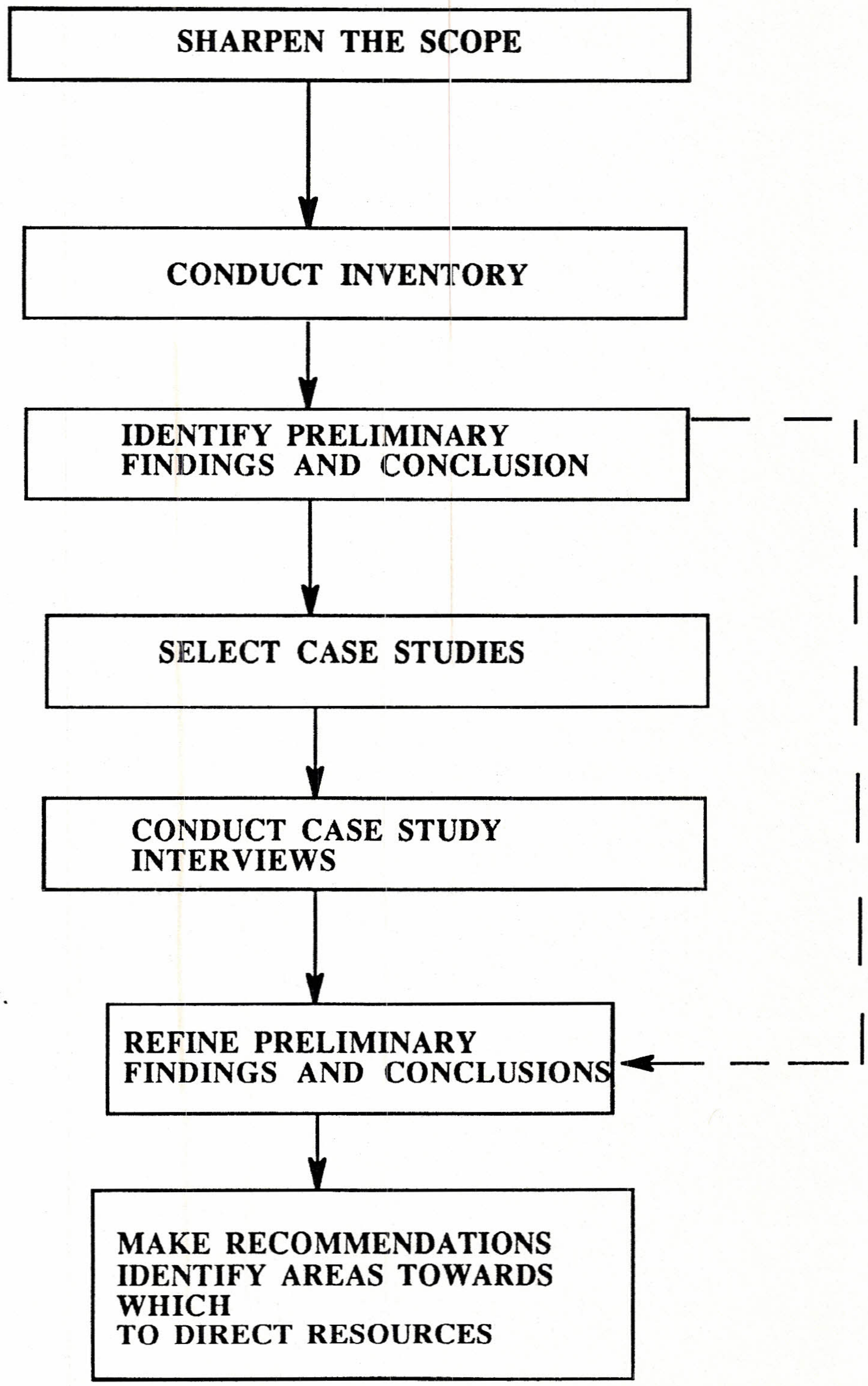
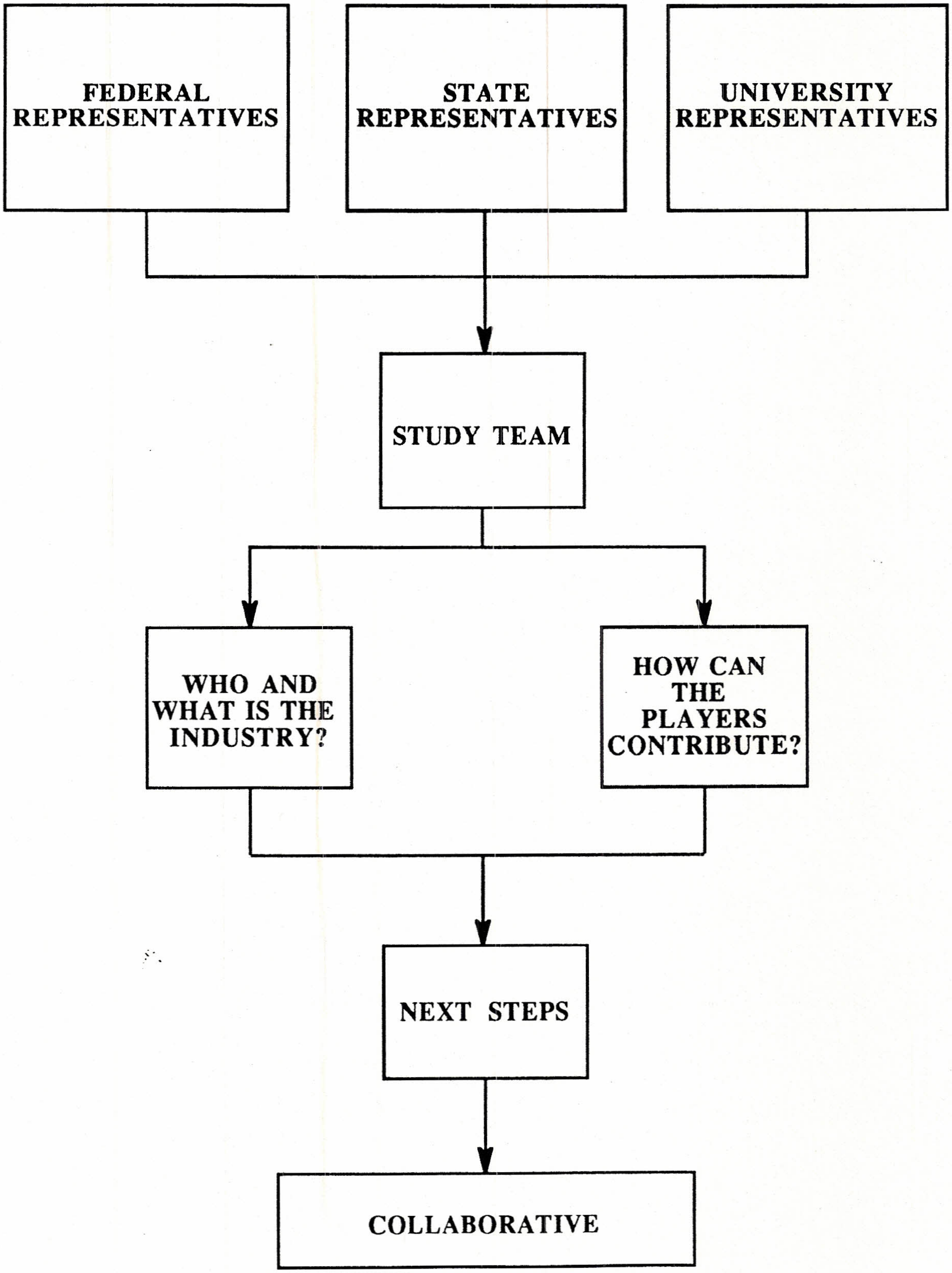


FIGURE 1:
ROLE OF THE STUDY TEAM



II. HISTORICAL PROFILE

Origin: From China to America

Paper originated in China around 100 A.D. At that time it was made from plant fibers that were beaten to a pulp, suspended in water, and formed into sheets by draining the fibers onto a screen. Eventually papermaking spread to the Middle East and Europe, reaching Spain and North Africa by 1200. Sometime during this spread the raw material for paper changed from plant fibers to cloth rags.

Papermaking was introduced to the United States in Philadelphia in 1690 when a group of immigrant papermakers formed a partnership with a printer and two investors and built the Rittenhouse Mill--the first papermaking mill in America. The endeavor was encouraged by prominent individuals in the city, including William Penn and printer Benjamin Franklin, who sought a domestic source of paper for their business activities.

Prior to establishment of this mill, all paper for every use (writing, printing, packaging) had to be imported from Europe. With Rittenhouse Mill and subsequent paper mills operating, paper production gained a place in the manufacturing history of Colonial America and alleviated some of the need for importing paper. According to the Smithsonian Institution, however, dependence on imported paper continued long after the industry was established. Paper production required skilled craftsmen trained in the Old World, a supply of raw materials, water for processing and power, and capital to fund construction of the mills. Demand for the product increased nevertheless, encouraging the growth of the industry, and papermaking gradually spread throughout the colonies.

Evolution of the American Paper Industry

From the beginning of American papermaking in 1690 until the mid-ninteenth century paper was made by hand from cloth rags. Since rags were in short supply, early paper mills were built near urban areas where rags could be collected from a larger population. The chronic shortage of rags plagued every papermaker, and by 1860 rags had to be imported to meet the demand.

New technology was introduced to the industry around 1800 with the invention of the paper machine. In 1816 the first paper machine in the United States was built and installed in a Delaware mill. The mechanization of papermaking had a dramatic effect on the industry by encouraging the production and use of more paper. As a result, the already severe shortage of rags for pulp was exacerbated, and the search for a substitute pulp began. By 1860 wood pulp was introduced as a substitute; in twenty years it would be the predominant source of raw material for papermaking.

The Throwaway Society

Technological improvements like the paper machine and the use of wood pulp allowed the development of more and varied paper products. According to the Smithsonian Institution the number of uses for paper multiplied four times between 1870 and 1880 alone. Paper was even used in the manufacture of clocks, musical instruments, and the core of a railroad car wheel. The paper bag and other forms of packaging emerged along with clean, disposable medical supplies and personal hygiene products. This concept gave birth the idea of disposable paper products, and the turn of the twentieth century found a new type of society being formed--the "throwaway society".

Today we continue to enjoy the advantages of paper products. Societal responsibility in the form of conservation, recycling, and protection of the environment, however, is replacing convenience as the important focus of paper products and the paper industry. It is recognized that the "throwaway society" may no longer be in society's best interest, and the industry is responding through increased recycling and planting more trees than it requires for raw materials.

The Consistency of Change

The ability of the paper industry to respond to the changing needs and demands of society sets it apart from many other industries. For nearly two thousand years paper and the paper industry have changed and adapted to meet the needs of the time. Paper is an integral part of modern life and it is here to stay. The key to maintaining a thriving industry is to recognize its consistency of change, anticipate the change, and plan for it.

III. DATA COLLECTION RESULTS AND ANALYSIS

National Trends in the Paper Industry

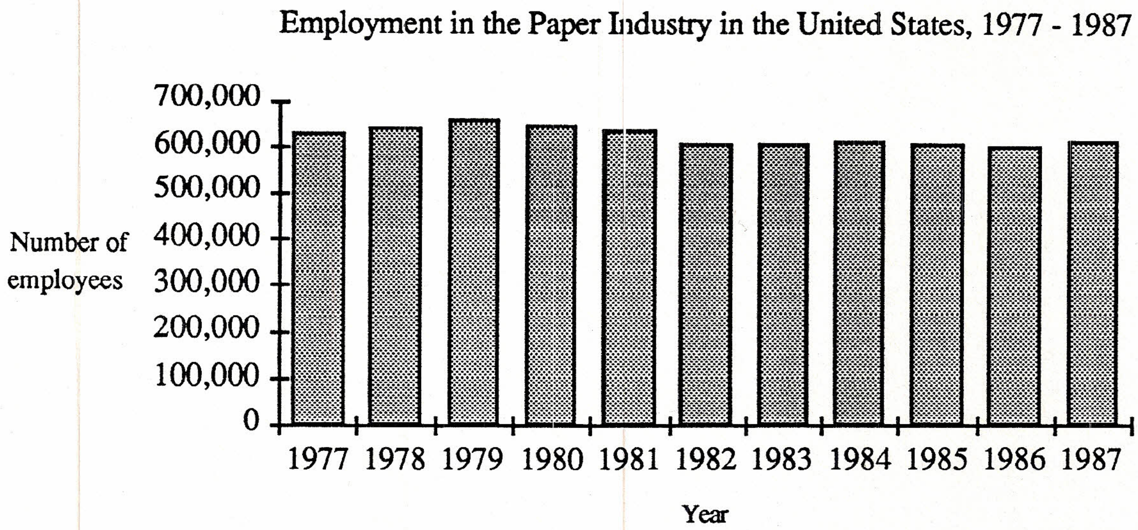
The paper industry in this country is of vital importance to our everyday lives. It is estimated that in the United States, the average person consumes 670 pounds of paper per year.[1] According to the U.S. 1991 Industrial Outlook, "the domestic paper and allied products industry ranks about tenth among all manufacturing industries in sales and gross investment." This rank has remained constant over the last ten years. Paper is also one of the largest users of energy. The industry ranks fifth among all manufacturing industries in energy consumption, although half of this power is self-generated.

The paper industry in the United States has traditionally been a strong and steadily growing industry. Sales in 1989 totaled roughly 28 billion dollars.[2] The paper industry is considered a stable industry, with growth closely paralleling growth in the Gross National Product.[3] In the early to mid-1980s growth in the industry ranged between 4 and 6 percent per year. The paper industry has experienced slower, but steady growth in recent years. Its estimated growth rate in 1991 was 2.1 percent and is expected to grow at 2.3 percent annually between 1991 and 1995.[4] Total employment in the paper industry has not changed much in the last ten

[1] Smithsonian Institution, 1991
[2] Standard & Poor's Industry Surveys, April 1991
[3] Standard & Poor's Industry Surveys, April 1991
[4] U.S. Industrial Outlook

years. Employment has ranged between 600,000 and 700,000 employees every year between 1977 and 1987 (see Figure 3).

Figure 3:



Source: 1987 Census of Manufactures

An important distinction often made when referring to the paper industry is the difference between primary producers and converters. Primary producers are pulp, paper, and paperboard mills. These are the capital-intensive, primary manufacturers that process wood fibers, rags, or recycled paper. Their products are: wood pulp, paper, containerboard, and boxboard.

Converters, in contrast, are industries that purchase paper and paperboard from the primary producers and convert that material into tens of thousands of finished products. Converter industries are the dominant paper industry employers in the United States. Converter paper industries employed 68 percent of paper workers in the United States in 1987. This percentage has not changed in the last ten years (see Figure 4).[5]

Figure 4:

U.S. Employment in the Paper Industry: Primary Producers vs. Converters

Year	Primary Producers	Converters	Total Employment
1977	210,800 **32%**	445,100 **68%**	665,900
1982	201,300 **33%**	400,800 **67%**	602,100
1987	195,600 **32%**	415,700 **68%**	611,300

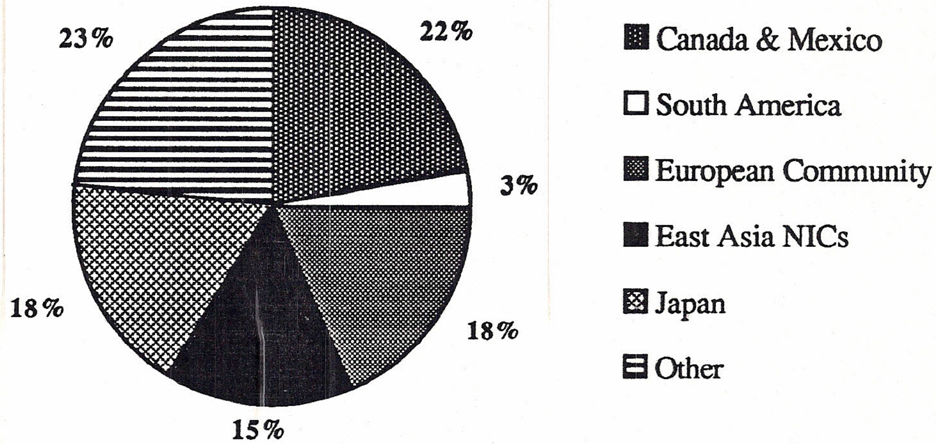
Source: Census of Manufactures - 1977, 1982 & 1987

The U.S. paper industry presently exports paper to numerous countries. Figure 5 shows what percentage of U.S. paper exports are going to each of the major paper-purchasing countries. Clearly, the largest share of U.S. paper exports go to Canada and Mexico, with Japan a close third. The bulk of American exports consist of packaging materials and wood fibers used for paper making. The total value of U.S. paper exports in 1989 was 8.3 billion dollars.

[5] 1987 Census of Manufactures

Figure 5:

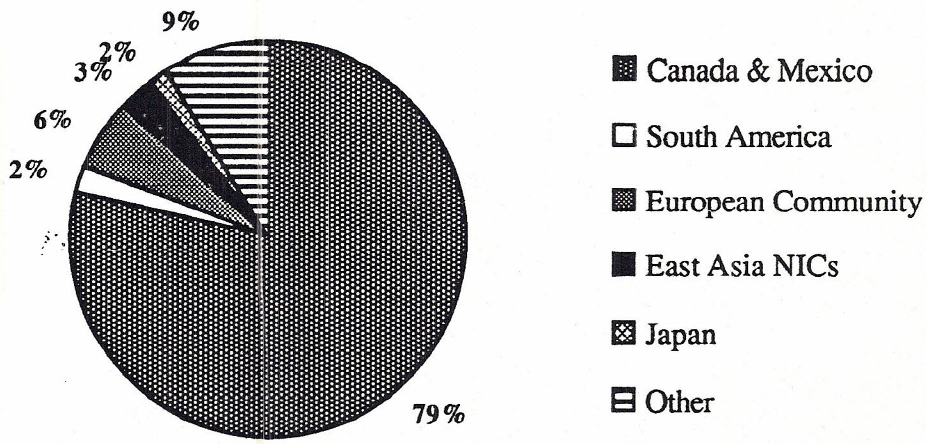
U. S. Exports of Paper Products in 1989



Source: U.S. Industrial Outlook 1991

Figure 6:

U. S. Imports of Paper Products in 1989



Source: U.S. Industrial Outlook 1991

However, the United States imports many more paper products than it exports. The total dollar value of U.S. paper imports in 1989 was 11.9 billion dollars.

Canada and Mexico dominate U.S. imports even more than they do U.S. exports (79% of imports vs. 22% of exports). (see Figure 6). Major U.S. purchases include newsprint, woodpulp, printing and writing papers, and converted office and school paper products.

The U.S. has historically had a large foreign trade deficit in paper products, mainly because of large U.S. purchases of Canadian newsprint. Canada supplies nearly 60 percent of the annual U.S. newsprint requirements. The trade deficit is shrinking, however. The trade imbalance totaled an estimated 2.3 billion dollars in 1990, down from 3.3 billion dollars in 1989. The reduction in the trade imbalance is mainly because of the changing value of the U.S. dollar relative to other countries and the growing world demand for high quality paper products made in the United States.

It appears that at a national scale at least, the future of the paper industry as a whole is strong. It does not appear that the paper industry is in the same situation as other U.S. industries that have declined rapidly due to foreign competition. U.S. paper industries have the competitive advantages of state-of-the-art equipment, high levels of capital investment, and the largest and best maintained forests in the world.[6] Future growth will depend

[6]Standard & Poor's Industry Surveys, April 1991

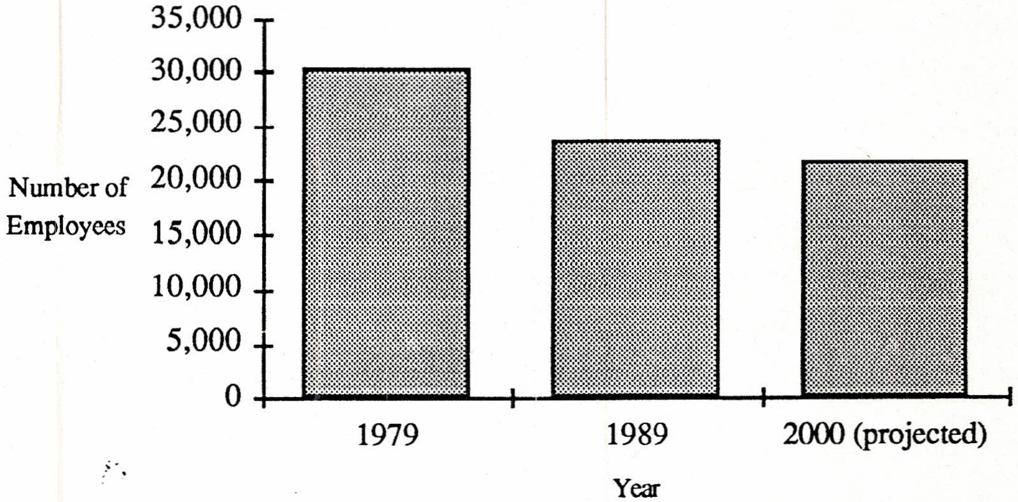
greatly on economic stability, the ability to reduce negative environmental impacts, and the availability of adequate and affordable energy supplies.

Massachusetts Trends in the Paper Industry

In contrast to the national trend, total employment in Massachusetts paper industries is declining (see Figure 7). Employment in Massachusetts' paper industries declined 22 percent between 1979 and 1989. Total employment went from 30,487 in 1979 to 23,723 in 1989.

Figure 7:

Employment in the Paper Industry in Massachusetts - 1979, 1989, & 2000



Source: Department of Employment and Training, 1989 County Business Patterns

In addition, employment is projected to decline 12.3 percent between 1987 and the year 2000.[7] This projection is not meant to be a precise forecast. Rather, it is intended to be an indicator of the general direction of the paper industry.

From the data that are available it appears that converters make up an even higher percentage of employment in Massachusetts than in the U.S. as a whole (see Figure 8). (The Census of Manufactures sometimes aggregates data so as not to reveal information about individual companies. In cases where only a range of employment was available, the median value was used.)

Figure 8:

Percentage of Massachusetts Employment in Primary Producers and Converters

	Massachusetts		U. S.
	1982	1987	1987
Primary Producers	23%	15%	32%
Converters	77%	85%	68%

Source: Census of Manufactures, 1982 & 1987

In 1987, 85 percent of the employment in the paper industry in Massachusetts was in converter industries. This is much higher than the 68 percent at the national level. Also, unlike the national trend, it appears that

[7]Department of Employment and Training

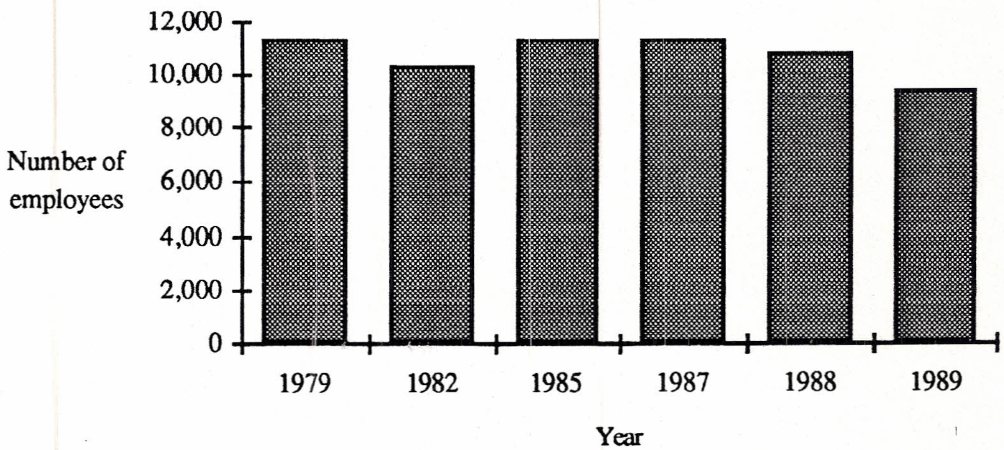
the percentage of employment in converters in Massachusetts is growing, rather than remaining constant.

Western Massachusetts Trends in the Paper Industry

The paper industry in Massachusetts' four western counties employed 9,470 people in 1989 (see Figure 9). This represents a 16 percent decline in employment since 1979. As mentioned earlier, employment in the paper industry state-wide declined 22 percent.

Figure 9:

Employment in the Paper Industry in Western Massachusetts, 1979 - 1989



Source: County Business Patterns, 1979, 1982, 1985, 1987, 1988, & 1989.

In addition, employment in the paper industry in Western Massachusetts made up 13 percent of total manufacturing employment in 1989.[8] In

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[8] 1989 County Business Patterns

contrast, employment in the paper industry in the state as a whole (23,723 people) made up only 4 percent of total state manufacturing employment in 1989. Western Massachusetts also accounts for nearly 40 percent of Massachusetts employment in the paper industry.

In order to better understand the paper industry in Western Massachusetts, an economic base analysis was done. The Location Quotient for the paper industry and selected manufacturing industries in Western Massachusetts was calculated. The Location Quotient was used to show the relative share of employment in western Massachusetts compared to the United States.

The Location Quotient is used to determine whether a particular industry is basic or non-basic. Basic industries are those which export goods and services to areas outside the region, while non-basic industries provide goods and services to the local market. If the Location Quotient for a particular industry is greater than 1, it is considered a basic industry; while if it is less than one, the industry is considered non-basic. In general, higher levels of basic industry are beneficial to a community, because the money from the sale of exported products has a multiplier effect on the local economy.

In order to get comparable data for the U.S. and Western Massachusetts, 1988 data were used, because comparable data for 1989 and 1990 were not available. Figure 10 shows employment in selected manufacturing industries in Western Massachusetts. The Location Quotient for the paper industry was 5.64, indicating a high percentage of basic employment. (See

Appendix C regarding methods used in this analysis.). This figure is much higher than for the other selected industries. In addition, the location quotient for the paper industry for Massachusetts as a whole was calculated, and the result was 1.45. While the paper industry is basic to the entire state, its is significantly more important to the economy of Western Massachusetts.

Figure 10:

Location Quotients for Selected Western Massachusetts Industries

SIC Code	Industry	Loc. Quot.
20	Food & Kindred Products	0.60
24	Lumber & Wood Products	0.59
26	**Paper & Allied Products**	**5.64**
27	Printing & Publishing	2.11
30	Rubber & Misc. Plastic Products	2.92
34	Fabricated Metal Products	2.14
35	Industrial Machinery and Equipment	1.60

Source: 1988 County Business Patterns & 1990 Statistical Abstract of the United States

A Profile of the Western Massachusetts Paper Industry Today

Throughout its extensive history in Western Massachusetts, the paper industry has gone through many cycles. It has played an integral part in the economy of the region and has provided thousands of jobs to its residents. This section presents an analysis of the current status of the paper industry in Western Massachusetts:

- •Who the paper companies are
- •What they do

•Where they are

•What changes and problems are affecting them

The number of paper converters and paper producers presently in operation in Western Massachusetts were identified using the most updated resources available. (See Appendix B) a database listing company names, product and/or process, and standard industrial classification (SIC) code. Figure # 11 is a map of the four county region (Berkshire, Franklin, Hampden, Hampshire) showing major transportation routes (water, rail, and highway) county boundaries, and the city and town names. On this map is plotted the approximate location of each of the companies listed in the database. Paper converters are depicted with solid dots and paper producers with open dots.

Three patterns are revealed by Figure #11 First, a majority of the companies are located in urbanized areas with a high population density. Second, each company is located on or very near a major transportation route. Third, there are approximately twenty producers and sixty converters. The explanation for the first two patterns seem obvious and had been predicted: companies depend on an available transportation network and an abundant labor force. The third trend had not been predicted by the study team. In light of historical research we had expected a greater concentration of paper producers in Western Massachusetts. Figure # 11 proved our assumption wrong.

Figure 11 implied to the study team that there was a significant shift from paper production to paper conversion. Obviously there is a greater

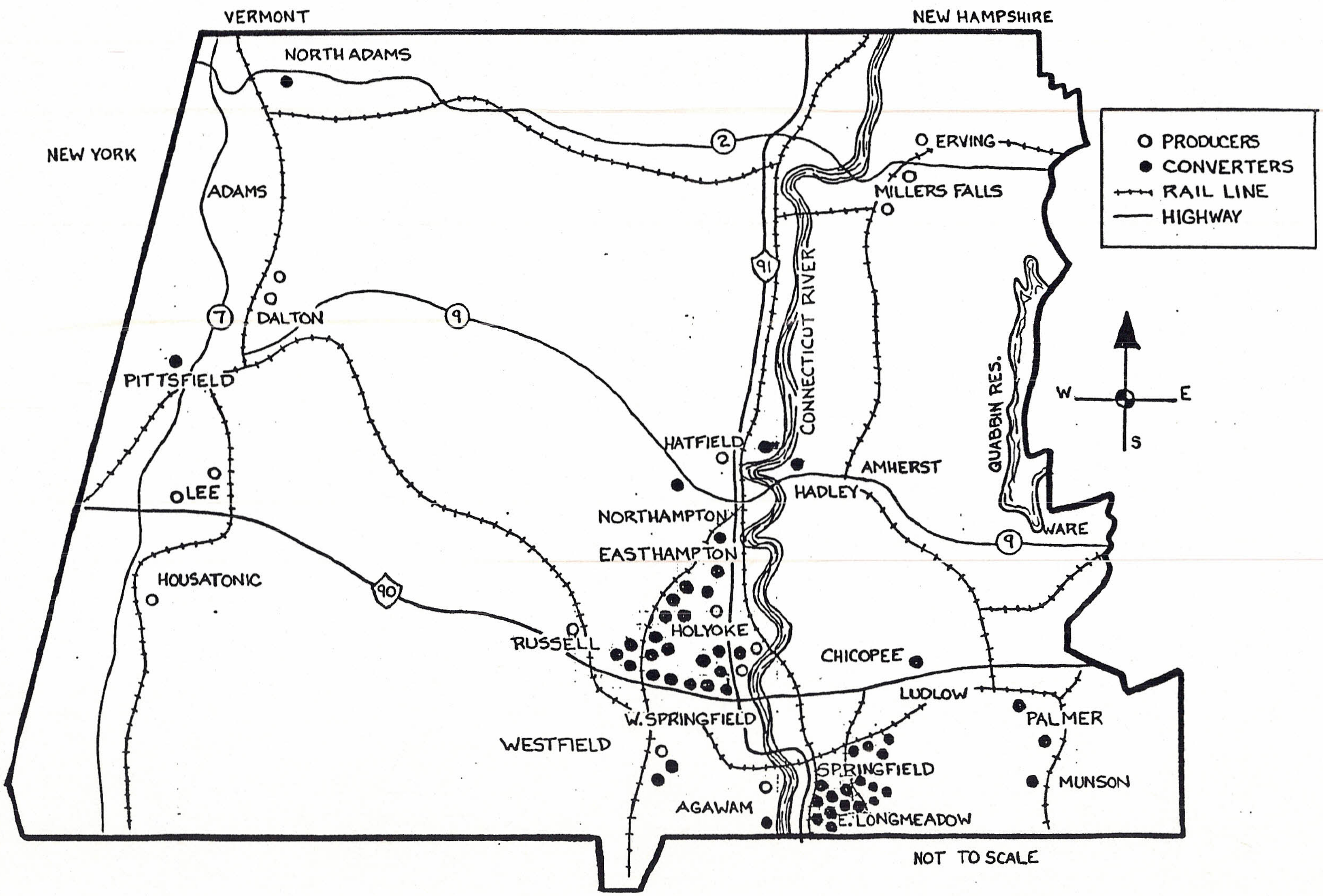

Figure 11:
Locations of Paper Companies in Western Massachusetts

demand for different types of converted paper as our society has become very dependent on a multitude of disposable products. Other reasons for the cause of the decline of the paper producing industry in Western Massachusetts were examined.

The study analyzed the apparent shift by taking a "snapshot" of the industry and studying the situation of a paper producing community. Analyzing the specifics of the industry on a smaller scale would provide a more manageable knowledge base for the project. The city chosen for this study was Holyoke. A city with a population of 35,000 located in Hampden county, Holyoke has long been known for paper production.

Holyoke, originated as one of the first planned industrial cities in the country. Located along the mighty Connecticut River, the canal system was an integral part of the paper industry. Companies lined the river taking advantage of the water for power and production. First the textile companies came and built their mills. In 1850 financial speculators from Boston saw the potential for developing a large textile district equal to those in Lowell and Lawrence , Massachusetts.

In 1853 Joseph Clark Parsons founded the first paper mill in Holyoke, The Parsons Paper Mill. This soon changed the plans of developing Holyoke into a great textile industrial city. By the mid 1890's there were approximately thirty paper mills in operation, producing 205 tons of paper a day. As the world grew smaller through faster communication, the need for paper grew concurrently.

Paper was produced primarily with rags,which was the reason for constructing multi-story mill complexes. The rags were delivered to the third floor where they were sorted and impurities removed. The rags were then lowered to the second floor where they were boiled and bleached. The third and final step occurred on the ground floor where the paper was processed from the rag pulp.

In its heyday,Holyoke had fifty (50) paper machines manufacturing paper, An abundance of mill housing within walking distance of the factories, was provided for the more than 4,000 employees. The city of Holyoke had earned the title of "The Paper City". Today, one hundred years later, Holyoke has only nine (9) paper producing machines (of which five are presently operating in two companies) employing 240 people. Since 1963, the city has lost 1,704 jobs because of plant shut downs and 69 jobs because of automation and technological innovations. The picture of the paper industry in Holyoke from 1963 to 1974 is not a healthy one. During this eight year period, nine plants shut down.

Reasons for this decline include:

1.Capital investments were not made in improvements to the mills that would have allowed them to remain competitive.

2. Proximity to the river and increasing environmental regulations have made expansion very difficult. (See Appendix E for complete listing of Federal regulations for mill sitings) New, technologically advanced machinery that can produce paper faster and with better quality is several

hundred yards long and cannot be sited in multi-story mills. These newer machines are designed to be located in single floor facilities. To construct such a new mill in Massachusetts appears to be extremely difficult. The environmental constraints are extremely stringent, and the cost and time involved are more than many companies have to spend.

3. Job loss in operating mills was attributed to technological innovation and product change. A paper company that produces with cotton fibres instead of rags does not need as many employees. A company that makes the transition from rags to cotton eliminates the positions of washer engineer, washer helper, bleach maker, rag cutter, bleach boiler operator and helper. Automation advances within the industry have allowed jobs once done by three employees to be done by one.

The two paper producing companies remaining in the city attribute their success to competing in a niche market and continued capital improvements. One of the companies for example, is Parsons Paper--the first paper company in Holyoke. Its longevity and success rests in the company philosophy: "For a company to progress, it must constantly re-invest money back into the operating area of its plants". An annual re-investment of at least $100,000 has been the rule. Putting money back into the mill has helped keep the company modern, flexible and competitive. Surviving and remaining in the market for well over 100 years has allowed Parsons to establish a recognizable name in the paper industry. By continuing to produce paper with rags, Parsons has developed from a traditional manufacturer into a manufacturer of specialty paper.

The closing of the remaining paper producers in the city has had devastating effects on the community. There has been a significant decline in the economic base with thousands of jobs lost and a continuing decrease in the population. Abandoned mills are deteriorating along the river. Environmental regulations have made selling the sites difficult.

The paper industry has not totally abandoned Holyoke however; there are approximately 25 paper converters operating in the city employing 1,500 people. Converted products range from school supplies to disposable bibs.

<u>Summary</u>

This snapshot of Holyoke, helped to formulate several important questions about the paper industry (listed below) in Western Massachusetts;
which in turn aided the formulation of preliminary findings and conclusion
These questions include :

1. What are the implications of the region's shift from paper production to paper conversion?

2. Should the paper producing industry in Western Massachusetts be considered a thing of the past, and should resources go toward maintaining production as status quo, while helping converters to grow and expand?

3. If conversion of paper is to be the dominant facet of the paper industry, what is the status of the support network of suppliers to converters?

4. What specific requirements do converters need,and what obstacles are they coming up against?

5. Does the fact that fewer producers are available in Western Massachusetts mean that converters will start moving away to be closer to their raw material suppliers?

IV. PRELIMINARY FINDINGS AND CONCLUSIONS

The preliminary findings and conclusions about the paper industry listed below were established by the study team at the midpoint in the study. They are based upon national, state, and regional data regarding the paper industry. Sources included statistical publications and interviews with persons knowledgeable about the paper industry but not directly involved in the activities of an operating paper company (see References). These preliminary findings and conclusions formed the basis for the subsequent case studies (See Section V.).

1. On a national scale, the paper industry is stable and projected to continue a slow but steady growth rate of 2.3% per year.

2. Nationally, employment in paper and allied products is stable but production is increasing, indicating a possible increase in automation.

3. In Massachusetts employment in paper and allied products constitutes 4% of all manufacturing employment in the Commonwealth.

4. In Massachusetts employment in paper and allied products has decreased 22% between 1979 and 1989 and is projected to decrease an additional 12.3% by the year 2000.

5. In Massachusetts the percent of employment in paper production has decreased, while the percent of employment in paper conversion has increased.

6. Forty percent (40%) of the employment in paper industries in Massachusetts is located in the Western Massachusetts region.

7. In Western Massachusetts employment in paper and allied products constitutes 13% of all manufacturing employment.

8. Employment in paper and allied products in Western Massachusetts is declining at a somewhat slower rate than in the commonwealth as a whole (17% versus 22% respectively). Because the paper industry employs a higher percentage of workers in Western Massachusetts than in the State as a whole, however, this employment decline has a more significant impact on the Western Massachusetts economy than it does statewide.

9. Using employment as a measure, paper and allied products is a very "basic" industry in Western Massachusetts.

10. Historically paper production was the predominant facet of the paper industry in Western Massachusetts. During the last fifty years, however, the number of paper producers in the region has declined significantly, while the number of paper converters has increased substantially. It appears that a significant shift has occurred in the industry from primarily paper production to primarily paper conversion.

11. The location of fewer producers in the region may force converters to relocate closer to their sources/suppliers.

12. Due to the expense, complexity, and inconvenience created by modern land, air, and water regulations, it is both undesirable and extremely difficult to site a "greenfield" mill (in other words, building a new mill on a vacant lot).

13. A central location and proximity to transportation routes (highway and rail) and to a water source are essential for the successful operation of a paper company.

14. Paper and paper products are an essential and integral part of modern life and are incorporated into more aspects of daily life than meet the eye.

VI. CASE STUDIES

Purpose

The case studies were conducted for three main purposes:

1. To verify preliminary assumptions and conclusions about the paper industry.

2. To identify issues and concerns in the paper industry in order to ensure these interests are part of this and future efforts.

3. To provide a basis for establishing focus groups (see page ix in Executive Summary for definition of a focus group). Information gained from the case studies will further educate the study group and the sponsors about the industry The case studies will also facilitate a more informed and credible focus group format.

Method

Diversity was a major determinant for which companies were included in the case studies. The companies that were included in the case are from a wide range of paper companies. The specific companies that were chosen and the characteristic for which each was selected were:

Company Name & Location	Characteristic
•Kanzaki Specialty Papers-Ware.	Large Foreign-Owned Converter
•Esleek Man. Comp.- Turner's Falls	Small Producer
•Holyoke Card & Paper - Springfield	Small Converter
•Mead - South Lee	Large International Producer
•Interprint - Pittsfield	New Small Foreign-Owned Converter

The case studies are not, nor were they intended to be, a statistically representative sample.

An interview was scheduled with a representative of each company. Each interview lasted approximately ninety minutes and covered a set of twenty-six questions. (See appendix A for a complete list of the questions.)The questions involved three main categories of information.

1.Basic company description:

- •company size
- •product
- •number of employees

This information was obtained in order to get a quick description of each company. Specific information about products, and information which indicated change in the companies (such as decline in employment or size) would enable the study group to better understand the companies' problems and concerns. In addition, such information will be useful as part of a complete description of all paper manufacturers in western Massachusetts which may be completed at a later date.

2. Components of business operation

- •transportation
- •competition
- •exports & imports
- •capital improvements
- •raw materials / suppliers
- •research & development
- •support networks

This information is useful because it gives a more detailed picture of each company. All of these factors are important to the successful operation of a company. By asking these questions, each company's strong and weak points could be determined and evaluated.

3. Problems, concerns, & future opportunities

- future plans
- competitive advantages and disadvantages
- problems
- suggestions for policy makers

This set of questions was the most useful for the purposes of this study. It was important to allow the paper company executives to express their major concerns and plans for the future. Also, information could be obtained about what type of assistance, if any, the paper industry would like.

Results

The responses to the questions were analyzed, and the results were divided into ten broad categories.

1. Over-Regulation

Among all of the companies studied, the concern most often expressed was regulation. Although they recognized the importance of such regulation, each of the company representatives felt that uncoordinated and confusing environmental, health, and safety regulations made it very difficult for businesses to remain competitive in Massachusetts. This seemed to be a particularly severe problem for the smaller firms that could not keep up with new regulations. Representatives from the smaller firms expressed the need for a full-time staff person to handle regulations, but could not afford to hire someone. The regulation problem was viewed as becoming particularly severe in the last five years. It was also suggested that the United States undertake a detailed examination of all of its environmental regulations in order to better understand the impacts of such regulation on industry. The company representatives felt that the paper industry can maintain its competitive edge worldwide as long as regulations balance social responsibility with the ability to run a business.

2. Smaller Firms / Bigger Problems

Related to the problems of over-regulation are the problems unique to the smaller paper companies. As mentioned earlier, smaller firms have difficulty finding the time or the money to deal with extensive regulations. In addition, smaller firms have greater difficulty financing needed capital improvements and research and development.

3. Competitive Advantages

Each of the companies uses niche marketing. In other words, they specialized in a very specific product or several closely related products. This appears to give the companies strong competitive advantages, because they often are the only or one of only a few companies making a specialized product. In addition, each company representative stressed the importance of customer service in maintaining a competitive edge.

4. New Products/New Technology

The paper companies in Western Massachusetts have adapted to new technologies. For example, as the demand for typing papers has declined due to the increased use of word processors, the companies have switched to the production of products that are in more demand. The rapid growth in the use of fax machines has also created a new demand. One of the companies has met that demand and is now the largest producer of fax paper in the United States.

5. Concern about Education/Social Issues

The company executives expressed concern about various social issues, particularly education. The representative from one of the larger firms expressed the company management's desire to be "good corporate citizens". This company is involved in various community groups and supports local substance abuse programs. The companies are interested in improving the educational system because students are increasingly unprepared to enter the workforce. One company has been involved in direct financial support of the local school system. All of the company representatives expressed interest in joint training and continuing education programs.

6. Limited International Exporting & Importing

There does not appear to be large amounts of international exporting or importing of paper products in western Massachusetts. (This is in contrast to the paper industry at the national scale, which participates more extensively in export and import activities.) For example, out of nearly five hundred chemicals needed in the paper making process for one of the companies, only about three are imported. Only one of the companies seems to have any major international exporting or importing. Twenty-five percent of this company's annual sales are outside of North America. The main purchasers of its products are Europe, Japan, Taiwan, Korea, Austria, Columbia, Venezuela, Brazil, and India. The company's only imports are some pulp and raw materials.

7. Transportation Factors

Four of the five companies rely almost exclusively on trucking for shipping of raw materials and products. There is limited use of rail. For one company the amount of product shipped to each customer is too small to support the use of rail. However, two companies which had used rail in the past have discontinued use. For one, it is because there is no longer an active rail line near the company. The other, in contrast, no longer uses rail because the newer, fifty-foot rail cars are too big to maneuver in the limited space they have. One of the large firms was the exception. This company ships 75 percent of its supplies and 10 percent of its products by rail.

8. Converters vs. Producers

Apparently, there has not really been a shift from primary producers to converters. What has actually occurred, according to the company representatives, is a decline in primary production, while converters have remained constant. Reasons given for the decline in production include:

- high labor costs
- limited access to water and trees
- products becoming obsolete
- difficulty of siting a new paper mill in Massachusetts

9. Recycling

From two of the company representatives, it was learned that the paper industry at a national scale is committed to recycling 40 percent of its products by the year 2000. The industry has invested millions of dollars in new equipment to meet this goal. In addition, the U.S. paper industry plants more trees than it uses for production. While there are problems with the recycling programs in Western Massachusetts, the company representatives appear to be committed to continued recycling efforts

10. Suggestions for Policy Makers

The company representatives were asked what policy makers at the federal level, state level, and at the University of Massachusetts could do to assist the paper industry in Western Massachusetts. For the federal level the recommendation most often expressed was to create a level national and international playing field. Regulations regarding environmental issues, health care, and workers compensation should be applied consistently throughout the U.S. In addition, the company representatives recommended efforts be made to improve the business climate in Massachusetts. Such efforts should include: a comprehensive examination of environmental policies, tax credits, improved job training programs, lowered workers compensation costs, and overall encouragement of economic development in Massachusetts. The company representatives also expressed interest in University assistance. They were particularly interested in potential research and development projects and educational programs for management and technical people.

Verification of earlier conclusions

The results of the case studies were examined to determine if they supported our earlier conclusions about the paper industry in Western Massachusetts.

•Has there been a shift from paper producers to paper converters?

As previously stated, the case studies did not support a shift from primary producers to converters. Production appears to be declining while converters are remaining constant.

•Has the location of fewer producers in the region forced converters to relocate closer to supply?

The case study representatives also indicated that converters will not have to leave the area, because a reliable supply network exists for the converters in Western Massachusetts

•Is siting a new paper mill in Massachusetts undesirable and nearly impossible?

All of the paper company executives felt strongly that a new paper mill would never be sited in Massachusetts because of locational and regulatory problems.

•Is a central location and proximity to transportation routes and a water supply essential?

None of the businesses interviewed mentioned their transportation or infrastructure networks as essential for the successful operation of their companies. This does not necessarily mean that transportation is unimportant. However, with a transportation network that is currently meeting their needs, companies are talking about and concentrating their efforts on those areas which they feel need immediate attention, such as technological advances and regulation.

VI. POLICY IMPLICATIONS AND RECOMMENDATIONS FOR ACTION

The policy implications and recommendations that emerge from the study's findings have been divided into three categories:

A. Immediate Actions

B Areas Toward Which to Direct Resources

C. Future Actions and Studies

A. Immediate Actions

1. Release Information

The most immediate step of our studio upon completion of this report will be to circulate our findings to all interested parties, including The Donahue Institute, Congressman John Olver, and the paper companies

Serving as economic development operator for the University of Massachusetts,The Donahue Institute has specific need for the information in furthering its efforts to establish a collaborative of the paper industries in Western Massachusetts. As a representative of Western Massachusetts, Congressman Olver has the ability to strengthen the voice and relay the concerns of the paper industry to the federal level. This report will also provide an introduction to the collaborative idea and illustrate to the paper companies the important role they will play in shaping its outcome.

2. Design Focus Group Sessions

Focus groups will bring together members of the paper industry to discuss their individual concerns with the help of a discussion facilitator. Collectively they can decide on a course of action to ensure the continued vitality of the paper industry in Western Massachusetts.

We recommend that the first round of focus groups be held separately for paper producers and paper converters. It would be beneficial for producers to become familiar with each other's problems and concerns, and similarly for paper converters. The second set of focus group sessions should occur according to county. These sessions would involve both paper producers and converters by geographic region.. Bringing these companies together according to county may prove valuable in designing a collaborative for the industry.

B. Areas Towards Which To Direct Resources

The basis of our studio was to report on the status of the paper industry in Western Massachusetts and identify major concerns that should be placed on the agenda of our sponsors to receive immediate attention. In no particular order, these recommendations are:

1. Education

Education has become a major concern of many companies. Companies report that increasing numbers of high school graduates enter the work force incapable of learning how to learn on the job. While being interviewed, several paper company executives lamented that the new generation of workers is ill equipped in the basic skills of reading and writing. Though many of the jobs are manual, the changing demand for different products makes it is necessary for an employee to be flexible and easily adaptable to changing working conditions. We suggest that resources be directed to assist companies in establishing business / education programs. These programs may include companies acting as instructors in the classroom or businessmen using the company as a classroom in which to teach the students. The students of today are the employees of tomorrow. Businesses must play a role in preparing this work force.

2. Small Businesses

Small businesses do not have the resources of larger companies. They are not financially capable of investing in extensive research and development, capital improvements, re-investment, and job training. These are all important elements to remaining competitive in today's market.

Many small companies face the threat of leveraged buy outs by larger firms. We have learned that this has been the fate of several small local paper companies.

3. Regulatory Process

Companies are overwhelmed by the fast paced changes in the environmental regulatory process. Although executives recognize the importance of such regulations , the uncoordinated and confusing environmental, health, and safety regulations make it very difficult for their companies to remain competitive. The regulations are difficult to understand, are redundant with other agency regulations, and change frequently. Small companies in particular, cannot afford to have a full time environmental expert on staff to wade through complex and changing regulations. Our study team recommends that resources go toward coordinating these regulations in ways that are understandable and manageable by companies. Also there should be co-ordination among agencies to create a coherent set of regulations.

4. Develop a Level Playing Field

Companies in Massachusetts have a competitive disadvantage compared to many other states. The regulatory process and Massachusetts' perceived unfriendliness toward business has allowed other states with a friendlier attitude towards business and less regulatory stress to manufacture and sell more products ,thus command a greater share of the market. This is not to say that the regulations in Massachusetts are not necessary, but rather if competition is to be fair, it must be conducted equally.

Our studio team uncovered some disturbing information during our case study analysis. Internationally, there are some paper products manufactured in the United States that receive a 9% duty when exported. Conversely, that same product is exported from another country duty free. This inequality in duty payment encourages foreign imports and discourages United States exports and investments.

C. Recommendations for Future Actions and Studies

1 Establish a Center for Paper Technology

A Center for Paper Technology (CPT) would serve as a think tank dedicated to the problems and opportunities of the paper industry. The Center would be equipped to undertake projects ranging from scientific to managerial. A CPT would most directly benefit the smaller companies who do not have the resources or finances to undertake complex projects.

The University of Massachusetts at Amherst would be a suitable site for such a facility,because the resources and players are already in place: The Center for Manufacturing Productivity, The Center for Economic Development, state of the art research and development facilities, educational programs, and the Regional Planning Department that through this study has indicated itself to be a capable and competent planning resource. Involving the University in this project would make a tangible link between the public, private, and educational sectors in their efforts to assist the paper industry.

2. Establish a Support Network for an Industry Wide Recycling Effort

The problem that prohibits many companies from recycling is the location of recycling facilities. Many recycling facilities are located in remote areas far from large population centers where most paper is produced and used. Recycling is only feasible when it can depend on an enormous steady supply of paper. Currently the distance between the supply and the facilities is too great to make transporting the paper economical. There should be a solution to bring some type of recyling facility closer to the supply of recyclable paper.

3. Study the Role of Converters in the Region

The study team focused primarily on the evolution and decline of the production end of the paper industry. For a full understanding of the paper industry and its impact on Western Massachusetts, information should be gathered concerning paper converters. What is the history of conversion? What is the status of paper converters today? What integral part do they play in this region's economy?

4. Export Education Programs

Many changes to the international markets will happen in 1992. Exporting will provide additional revenues for many domestic firms. Unfortunately, their are companies who are not confident in the information that they have been receiving from experts in the export field. A paper executive with whom we spoke during our case study analysis expressed the desire to export, but was hesitant because he did not feel that the export, representative was knowledgeable about his particular business. Each company is unique in need and expertise. Export education should be conducted to address this situation.

5. <u>Design a Paper Industry Newsletter</u>

Design a paper industry newsletter to be distributed throughout the paper community in Western Massachusetts. The newsletter would be valuable in updating technological advances within the industry, notifying companies of the latest environmental regulations, and informing new companies and companies in need of assistance. This newsletter could prove to be a valuable tool in establishing an assistance network among the industry, because who knows the paper industry better than the paper industry ?

The paper industry is a vital component of the Western Massachusetts economy. This study examined the potential contributions that the various players could make to ensure that the paper industry remains vital in this region. Initial interviews among the paper executives indicate a strong interest in coming together with other members of the industry to discuss and guide their collective futures.

The paper industry firms in Western Massachusetts are quite specialized and subsequently they are not in direct competition with one another. For this reason there is good potential for the regions firms to form a mutual assistance organization. The Donahue Institute's concept is worth pursuing.