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Economic Linkages Between the U.S. Greenhouse and Nursery Products Industry and Landscape Services[1]

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Abstract

Landscape service firms are major purchasers of greenhouse and nursery products in the U.S. The 1985 U.S. Forest Service Impact Analysis for Planning (IMPLAN) input-output model for the state of Arizona was used, along with primary data, to illustrate how to make use of existing data to examine the economic linkages between the landscape services industry group and the greenhouse and nursery products industry. IMPLAN estimated that in 1986 the $247 million of sales made by Arizona landscape service firms stimulated $23.4 million in gross sales for the greenhouse and nursery production sector and $10.5 million in value added. The IMPLAN model is a useful tool for examining the link between landscape service firms and the greenhouse and nursery products industry.

Index words: landscape services, economic linkages, IMPLAN.

Significance to the Nursery Industry

Landscape service firms are major purchasers of greenhouse and nursery products in the U.S. According to the U.S. Department of Labor, the demand for landscape services is expected to increase in the future (3), thereby increasing the derived demand for greenhouse and nursery products. The greenhouse and nursery products industry would benefit from better information about the relationship between itself and landscape service firms.

This paper illustrates how the 1985 U.S. Forest Service Impact Analysis for Planning (IMPLAN) input-output model, along with primary data, can be used to investigate the economic linkages between the landscape services industry group and the greenhouse and nursery products industry at the state level. For 1986 in Arizona, the IMPLAN model estimated that $247 million in sales for landscape service firms stimulated $23.4 million in sales for the greenhouse and nursery production sector and $10.5 million in value added. The ability to predict the impact of sales for landscape service firms on the greenhouse and nursery industry makes IMPLAN a useful tool for the greenhouse and nursery industry.

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Introduction

Firms that provide landscape services represent a significant portion of the market for greenhouse and nursery products in the U.S. According to the 1982 national input-output tables, landscape service firms purchased $777 million dollars worth of greenhouse and nursery products in 1982. This accounted for 18% of the total value of greenhouse and nursery products sold that year (2). Further research indi-

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cates that wholesale nursery sales to landscape service firms represent an even larger percentage of total sales in some states (5, 11). While the number of employees in landscape service firms increased by 173% between 1977 and 1989 (6), it is difficult to estimate the impact of this increase on the demand for greenhouse and nursery products, because very little is known about the economic relationship between landscape service firms and the greenhouse and nursery products industry.

Information is available on landscape service firms nationwide from a variety of sources (Table 1). Businesses whose primary purpose is to provide one or more landscape services are considered by the U.S. Department of Commerce to be part of the Standard Industrial Classification (SIC) Agricultural Industry Group 078 (4), landscape and horticultural services (hereafter referred to as the landscape services group).

Harris et al. (10) estimated the 1977 forward and backward linkages between the greenhouse and nursery products sector and various other sectors, at the one digit SIC level. Economic activity was fairly evenly divided between forward and backward linkages. In the following analysis, input-output analysis was used to examine the linkages between the landscape services group and the greenhouse and nursery products industry in Arizona.

Materials and Methods

Input-output analysis was first developed by Wassily Leontief and has been described in numerous textbooks (12, 13, 14). In this case, it is used to estimate the effect of an increase in demand for landscaping services on other sectors in the economy. Because many major economic interrelationships are represented in the model, how much of each dollar spent on landscape services will, in turn, be spent on greenhouse and nursery products can be estimated.

The IMPLAN model can be used to estimate the value of the landscape services group for the year in which the model is based, but it cannot be used to predict the future value of the landscape service group, i.e. it is not a forecasting model. No current information is available on the total value of the landscape services group. Therefore, researchers must estimate the total value using primary data collection or estimate it using secondary data in order to use IMPLAN to analyze the economic relationships between the landscape services and other economic sectors in any year other than the base year. At the same time, the IMPLAN model is based on secondary data, making the accuracy of IMPLAN estimates no better that the quality of the data used in the model's construction. This poses problems in the study of landscape services, as discussed earlier.

In 1986, the Arizona 'Green Industry' (nursery and garden centers, greenhouse growers, field growers, florists, landscape service firms, sod farms and nursery sections of regional and national chain stores) was surveyed in order to estimate the value of industry output (1). The survey data on the gross sales of landscape service firms was used to estimate the relationships using the IMPLAN model. The 1985 IMPLAN model is based on the 1977 national input-output tables created by the Bureau of Economic Analysis in the Department of Commerce. Standard procedures were followed in verifying the model's economic database for Arizona and for correcting regional purchase coefficients and production coefficients, as outlined in the IMPLAN analysis guide (10).

Results and Discussion

In 1986, total sales for Arizona landscape service firms were an estimated $247 million (1). IMPLAN was used to determine of the economic impacts of these sales on various industries in Arizona. As indicated in Table 2, landscape service firms stimulated $23.4 million in gross sales for the greenhouse and nursery production sector and $10.5 million in value added (roughly equivalent to net receipts). Five-hundred-thirty-six jobs in the greenhouse and nursery sector are linked to the demand for nursery products by landscape service firms (1). If the sales of landscape service firms in Arizona increase by one dollar, the IMPLAN model predicts that Arizona greenhouse and nursery production will increase by ten cents or ten percent.

The 1986 Arizona survey found that the $247 million in total sales of landscape service firms represented 51% of total sales in the 'Green Industry.' Thirty-four percent or $84 million of the total $247 million in sales were attributed to sales of plant materials. It is not possible to determine from the report how much of the plant material was purchased from the nursery industry and how much was

Table 1. Description of data available for landscape service firms in the U.S.

Source	Data available	Frequency/ most recent
Department of Commerce, County Business Patterns	Landscape Services Industry Group • Employment • Payroll • Number of firms • Size of firms	Annually/1990
Department of Commerce, Census of Agricultural Services	Landscape Services Industries • Gross receipts • Number of firms • Employment • Payroll	Every four years/Discontinued 1978
Internal Revenue Service	Sole Proprietors and Partnerships in Landscape Services Industry Group • Payroll • Number of firms	Annually/1991
Department of Agriculture	None	Not applicable

Table 2. Impact of the landscape services group on various sectors of the Arizona economy, 1986.

Sector	Total value[z]	Employee compensation[y]	Value added[x]	Employment[w] (jobs)
	($1,000,000)			
Greenhouse & nursery	$23.39	$2.19	$10.54	535.7
Other agriculture	.18	.01	.06	1.5
Ag., fish & forestry services	.35	.15	.16	12.8
Landscape services	246.99	64.22	105.46	5,305.5
Mining	1.23	.04	.87	9.2
Construction	2.18	.66	1.04	29.4
Manufacturing	14.08	2.02	4.24	82.8
TCU[v]	9.79	2.89	5.79	109.6
Wholesale trade	11.24	5.20	7.88	187.8
Retail trade	5.24	1.68	2.95	126.9
FIRE[u]	6.07	1.02	4.19	81.8
Per. & bus. services	14.91	4.91	8.74	286.6
Health & ed. services	.08	.04	.04	1.2
Government services	2.34	1.06	1.05	32.5
Total	$338.07	$86.09	$153.01	6,803.3

[z]Total value is the total value of production by local industries.

[y]Employee compensation is the total cost of wages, salaries and benefits paid by local industry.

[x]Amount added to the value of inputs purchased to produce a good or service.

[w]Employment is in terms of total number of jobs, both full-time and part-time, not in terms of full-time equivalents.

[v]Transportation, communication and utilities.

[u]Finance, insurance and real estate.

produced by landscape service firms. In comparison, greenhouse, container plant and potted rose sales were $67 million, accounting for only 14% of total green industry sales (1).

The possible reasons that plant material sales reported by landscape service firms are higher than the IMPLAN estimates of greenhouse and nursery production stimulated by landscape services include:

- In the IMPLAN model, only an estimated 77% of the demand for plant materials by landscape service firms is met by Arizona greenhouses and nurseries.
- The IMPLAN value does not include the wholesale nursery products trade margin. Most landscape service firms would purchase products from wholesalers rather than directly from producers.
- An unknown amount of plant materials sold by landscape service firms was produced by the firms themselves or purchased from other landscape service firms. These transactions would not be accounted for by the IMPLAN model.

Almost half of Arizona's wholesale nurseries sales are to landscape service firms (17). This is well above the 35% state average of all nursery sales for the twenty-three states that participated in the Brooker and Turner study (5). However, Arizona wholesalers also indicated that the sales to landscape service firms as a proportion of their total sales fluctuated significantly from year to year. The cyclical nature of the sales may be due to fluctuations in the industry or industries that are large customers of landscape services firms. For example, construction accounted for 9% of the total sales of the landscape services group in 1982, according to the 1982 national input-output model (2). Construction activity is considered to be highly cyclical.

Landscape services have an important economic linkage with the greenhouse and nursery products industry. Because the greenhouse and nursery products industry has grown to become the sixth largest agricultural industry in the U.S. (16), there is increasing interest in understanding the factors affecting the sales of greenhouse and nursery products to landscape service providers.

A series of articles featured in this journal on the role that landscape architects play in shaping demand for greenhouse and nursery products in Georgia is a step toward understanding this linkage (7, 8, 9). This paper illustrates how input-output analysis can be used to examine the link between landscape service firms and the greenhouse and nursery products industry.

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