

Area Financing of Water Resource Development in West Minnesota

By

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FOREWORD

This bulletin is published in furtherance of the purposes of the Water Resources Research Act of 1964. The purpose of the Act is to stimulate, sponsor, provide for, and supplement present programs for the conduct of research, investigations, experiments, and the training of scientists in the field of water and resources which affect water. The Act is promoting a more adequate national program of water resources research by furnishing financial assistance to non-Federal research.

The Act provides for establishment of Water Resources Research Centers at Universities throughout the Nation. On September 1, 1964, a Water Resources Research Center was established in the Graduate School as an interdisciplinary component of the University of Minnesota. The Center has the responsibility for unifying and stimulating University water resources research through the administration of funds covered in the Act and made available by other sources; coordinating University research with water resources programs of local, State and Federal agencies and private organizations throughout the State; and assisting in training additional scientists for work in the field of water resources through research.

This Bulletin is number 66 in a series of publications designed to present information bearing on water resources research in Minnesota and the results of some of the research sponsored by the Center. The Bulletin is concerned with the financing alternatives in water resources development in a 14-county environmental planning area in West Minnesota. The data and methodology developed in the study provide a basis for comprehensive resource planning and programming on a multi-county scale.

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Publication Abstract:

A 14-county environmental planning area in West Minnesota was identified for the purpose of studying financing alternatives in water resource development. Nine of the 14 counties belong to a newly established Regional Development Commission. This Commission has responsibility for planning, research and review of local government activities in the nine-county area.

The remaining five counties are included with other newly organized Minnesota planning regions. Altogether, 719 units of local government (exclusive of the newly established planning commissions) were included in the study area in 1967, which is the base year for the study.

Economic and organizational structures in the 14-county area are described and analyzed in this study. A computable model of the area economy is presented. Estimates of the degree of internal interdependence of the area economy are derived as basis for assessing the current status of the area economy and its public financing potentials. The base-year data are used subsequently in the preparation of a projected 1980 inter-industry transactions table.

An expanded system of area product and income accounts is presented, also, for both the base year and the target year. These accounts are used in assessing the public economy as part of a total area economy. Water resource development potentials and financing requirements and alternatives are identified in the context of all public expenditures and outlays in a multi-county area.

The data and methodology developed in the study provide a basis for comprehensive resource planning and programming on a multi-county scale. Use of the technical capability for these purposes is illustrated for the 14-county study area. Further study is underway to facilitate use of the data and models in multi-county resource development and planning.

Publication Descriptors: *Financing Alternatives/ *Water Resources Development/ *Water Resources Planning/ Minnesota

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AREA FINANCING OF WATER RESOURCE DEVELOPMENT IN WEST MINNESOTA

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INTRODUCTION

The purpose of this report is to describe and analyze the economic and organizational structures of a multi-county environmental planning area with reference to the financing of water resource development. A 14-county area in West Minnesota was selected for the study (figure 1).

The 14-county study area covers 10,000 square miles of land and lakes. Of the 245,000 people in the area, 68 percent live in rural places and the open country. Only 10 of the 119 municipalities exceed 2,500 population, which makes them urban places.

Historically, the eastern part of the area has been well-known for its recreational amenities--its many lakes and both wooded areas and parkland. In the seven west counties, the fertile flat land of the Red River Valley supports a dominantly crop agriculture economy.

Of particular concern in state and regional planning are the social and economic disparities between one region and the rest of the State and the alternatives for dealing with these disparities. The region in this case is dependent economically upon agriculture and recreation; in the seven east counties both industries are characterized by low earnings and seasonal employment.

Low incomes and high unemployment or underemployment are coupled with high outmigration. During the 20-year period from 1950 to 1970, for example, 13 of the 14 counties experienced net outmigration (table 1). Much of the outmigration from the area is concentrated among recent high school graduates.

While the study area is losing population in the economically most productive age groups, it faces increasingly severe problems in financing essential public services sought by the remaining population. Resource development alternatives are presented, therefore, in terms of their implications for reducing gaps in both public and private financing of services, especially those affecting the quality of environment for area residents.

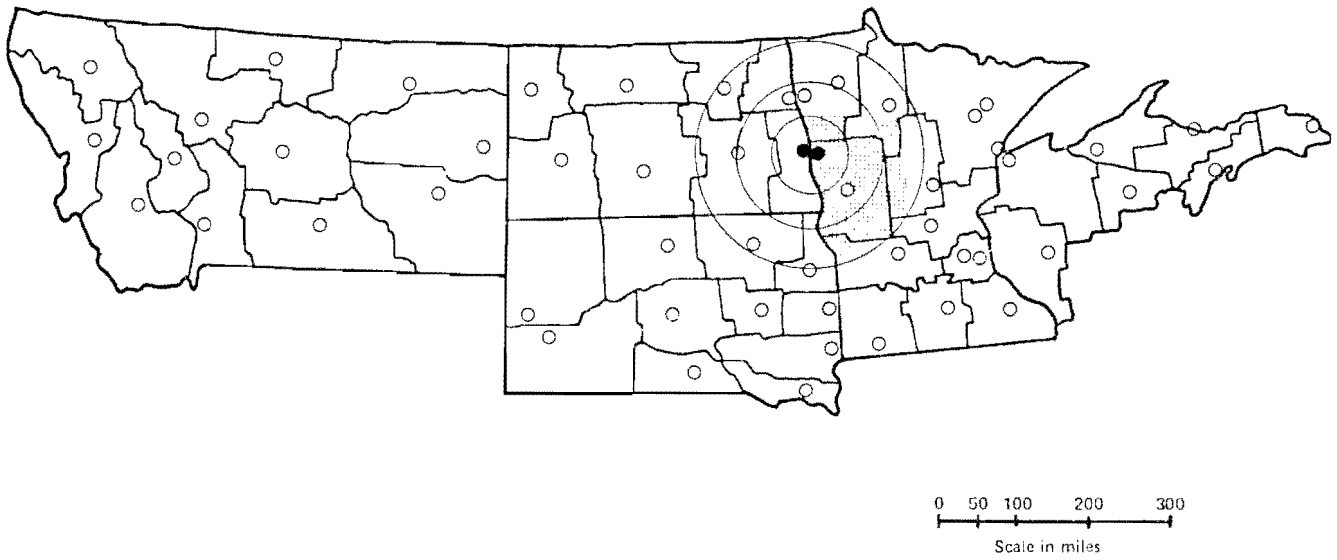


Figure 1. Multicounty planning areas and principal area centers in the Upper Midwest, 1970
(Circle areas are distance zones-50 miles per zone)

Table 1. Sources of population change, by county, West Minnesota, 1950-1970

	Change, 1950 to 1960				Change, 1960 to 1966 ^{b/}				
	1950	Migration	Other ^{a/}	Total	1960	Migration	Births	Deaths	Total
East Counties:									
Becker	24,836	-4,629	3,752	- 877	23,959	<u>c/</u>	3,400	1,600	1,800
Douglas	21,304	-2,659	2,668	9	21,313	-1,300	2,400	1,400	- 300
Hubbard	11,085	-2,353	1,230	-1,123	9,962	<u>c/</u>	1,300	800	500
Ottertail	51,320	-8,251	5,891	-2,360	48,960	-4,100	5,300	3,200	-2,000
Pope	12,862	-2,575	1,627	- 948	11,914	-1,400	1,200	800	-1,000
Todd	25,420	-5,607	3,306	-2,301	23,119	-2,200	2,900	1,600	- 900
Wadena	12,806	-3,039	2,432	- 607	12,199	-1,000	2,000	800	200
Total East	159,633	-29,113	20,906	-8,207	151,426	-10,000	13,700	10,200	-1,700
	1966	Change 1966 to 1970		1970					
Becker	25,800	-2,113		23,687					
Douglas	20,900	1,712		22,612					
Hubbard	10,500	- 232		10,268					
Ottertail	46,900	- 966		45,934					
Pope	11,000	23		11,023					
Todd	22,300	666		21,634					
Wadena	12,300	- 59		12,241					
Total East	149,700	-2,301		147,399					

Table 1 (continued)

	Change, 1950 to 1960			Change, 1960 to 1966 b/				Total	
	1950	Migration	Other a/	Total	1960	Migration	Births		Deaths
West Counties:									
Big Stone	9,607	-1,912	1,259	- 653	8,954	- 700	1,200	600	- 100
Clay	30,363	1,453	7,264	8,717	39,080	- 600	5,900	1,800	3,500
Grant	9,542	-1,808	1,136	- 672	8,870	- 400	1,000	600	0
Norman	12,909	-2,887	1,231	-1,656	11,253	- 900	1,200	800	- 500
Stevens	11,106	-1,960	2,116	156	11,262	-1,200	1,500	600	- 900
Traverse	8,053	-1,917	1,367	- 550	7,503	- 900	900	500	- 500
Wilkin	10,567	-2,036	2,121	83	10,650	-1,400	1,400	600	- 600
Total West	92,147	-11,067	16,494	5,425	97,572	-6,100	13,100	5,500	1,500
All Counties	251,780	-46,180	37,400	-2,782	248,998	-16,100	26,800	15,700	- 200
	1966	Change 1966 to 1970		1970					
Big Stone	8,800	- 780		8,020					
Clay	42,600	3,245		45,845					
Grant	8,800	-1,531		7,269					
Norman	10,700	812		9,888					
Stevens	11,000	14		11,014					
Traverse	7,100	- 895		6,205					
Wilkin	10,000	- 745		9,255					
Total West	99,000	-1,504		97,496					
All Counties	248,700	-3,805		244,895					

a/ Net births over deaths.

b/ Estimates are shown to the nearest hundred.

c/ Less than 50 or 0.5 percent.

Study Objectives

Given the importance of an area's economic base in determining its resource development and public financing potentials, one objective of this study was to develop and test methods for identifying and assessing the controllable factors affecting the financing of water resource development in a resource-based area of the State. By controllable factors, we mean the policies and expenditures of governmental agencies that influence the level of resource development in an area and that, in turn, are influenced by the decisions and attitudes of local citizens and organizations. Included in the primary purpose is the evaluation of methods for preparing future resource development alternatives and for measuring the amount of public intervention associated with each future alternative.

First described, therefore, are certain economic relationships of the area pertaining to its economic base and infrastructure. Both the economic base and the infrastructure, such as public buildings, roads and utilities, are taken into account in the preparation of area financing alternatives. Finally, area impacts of the resource development alternatives and related implementation gaps are presented.

Data and Procedures

For the most part, secondary data sources, such as the U.S. Census of Population (1960, 1970), the U.S. Census of Agriculture (1964, 1969), U.S. Census of Government (1962, 1967), the U.S. Census of Business (1963, 1967), the U.S. Census of Manufacturers (1963, 1967), and reports of the U.S. Department of Commerce, Office of Business Economics, were used in the study. Included among primary data sources is a survey of 150 industrial establishments conducted in 1969. The survey data were used in estimating the transactions among industry groups in the 14-county area. In addition, reports of state regulatory agencies were consulted in the interpretation and use of the secondary data.

Data preparation was facilitated by selection of a common set of counties for all phases of the study and by use of local surveys to clarify the secondary data and relate these data to both area problems and research design. A total of 29 private and public industry sectors have been identified (table 2) in the preparation of an area inter-industry transactions table. From these data a series of coefficients for estimating the direct and indirect effects of resource development are prepared.

The inter-industry transactions table provides a factual basis for developing the fiscal-ecologic accounts for water resource development planning. These accounts are the principal analytical and planning technique resulting from study.

The study findings are reported under seven principal headings, namely, decision models, economic trends, industry structure, public economy, fiscal-ecologic accounts, resource development potentials, and public financing alternatives. The focus is upon data and procedures for deriving and evaluating estimates of resource development impacts and area financing alternatives, with particular emphasis upon water resource-related activities in a multi-county planning area.

Table 2. Industry Classification, West Central Minnesota, 1967

RESOURCE PLANNING

Sector No.	SIC code No.	Industrial sector
01	013	Livestock farms: dairy, poultry, beef cattle, hogs
02	011,012,014,019	Other farms: field crops,vegetable,general,misc.agriculture
03	07,08,09	Agricultural, forestry, fishery services
04	14	Mining and quarrying
04	15,16,17	Contract construction: building, highways, special trade
05	201	Meat products manufacturing: meat, sausage, poultry
06	202	Dairy products manufacturing: cheese, milk, ice cream
07	203-209	Other food, feed and beverage products manufacturing
08	24,25	Lumber, wood, furniture products manufacturing
09	27	Printing and publishing
10	32	Stone, clay and glass products manufacturing
11	35,36	Machinery and equipment manufacturing: farm, construction, special industry, electrical, household appliances, radio communication
12	19,23,26,28-31, 33,34,37-39,22	Other manufacturing: ordnance, textiles, chemicals fabricated metals, transportation
13	40-47	Railroads and railway express; trucking and warehousing; other transportation - bus,water,air,pipeline; services
14	48,49*	Communications-telephone, radio, TV. Utilities and sanitary services: electrical,gas,water,sewerage,garbage
15	505	Grain elevators and livestock dealers
16	50	Other wholesale trade
17	58	Eating and drinking places
18	55	Gasoline - service stations
19	5252	Farm equipment dealers and farm supply stores
20	52(exc.5252),53, 54,56,57,59*	Other retail trade
21	60-67	Finance and insurance; real estate and rental
22	70,72,73,75, 76,78,88	Personal, business, repair, entertainment, recreation services
23	80-89(exc.88)*, 80-82,84,86	Medical services; educational services, other professional and non-profit services
24	1611**	Contract construction: highway and sheet construction
25	49**	Utilities and sanitary services: electrical, gas, heat, water supply, sewerage, and garbage
26	59**	Other retail trade: liquor stores
27	80**	Health: Hospitals, nursing homes, clinics, offices
28	82**	Education: universities, colleges, institutes, schools, libraries
29	91-93	Federal, state, and local government (exc. employment in gov't.employment in sectors 24-28), i.e. general gov't public safety, welfare, recreation, natural resources and other.

* Private industry establishments

** Public industry establishments

Alternative approaches to resource planning and development are being implemented in the study area. For example, a Regional Commission is being organized. Units of local government as well as state government are cooperating in this effort. In addition, the Souris-Red-Rainy River Basins Commission had been established earlier on an inter-agency and inter-state basis to study resource development potentials in the Red River Basin, of which most of the study area is a part. Data and information needs of these regional planning and development efforts are being anticipated in the presentation of the study findings (45,46,47,48).

Governmental Organization

Minnesota Planning Region 4 covers nine of the 14 counties in the study area.* A Regional Commission has been organized under Minnesota statute by the local governments in this area. The remaining five counties in the study area are part of the neighboring planning regions which have been or are being organized.

The Minnesota planning regions are viewed as one governmental level for environmental planning and water resource development in Minnesota (73). Individual municipalities and counties are involved, also, in these activities. At the same time, planning regions may need to cooperate on a broader geographical scale in dealing with water-related problems. Enabling legislation for the organization of such associations is lacking, however.

The 14-county study area thus represents a grouping of counties which is somewhat larger than the typical Minnesota planning region and somewhat smaller than a river basin planning region (e.g., Red River Basin). Moreover, the study area encompasses parts of several major river basins--the Minnesota River, the Red River and the Upper Mississippi River (figure 2). The area also is part of the Fargo-Moorhead development region which corresponds roughly with the Red River Basin. Included among the 14 counties are, therefore, several groupings of resource planning regions.

Finally, the study area is marked by economic variability stemming from the emergence of a metropolitan focal area, i.e., the Fargo-Moorhead Metropolitan Area (FMMA), which is located in the midst of a declining rural-agricultural hinterland (8). In the Red River Basin portion of the study area, however, a prosperous agricultural economy exists, but in much of the remaining area the agriculture is marginal and farm income per family is low. In addition, the 14-county area has certain natural amenities in its abundant woods and lakes which are being utilized by residents in the Twin Cities Metropolitan Area (TCMA) and outstate, especially North Dakota.

* An early delineation of the area included the following 10 counties: Becker, Big Stone, Clay, Douglas, Grant, Norman, Otter Tail, Stevens, Traverse and Wilken. Later, Pope joined this group and Norman and Big Stone joined other groups, thus leaving nine counties presently organized.

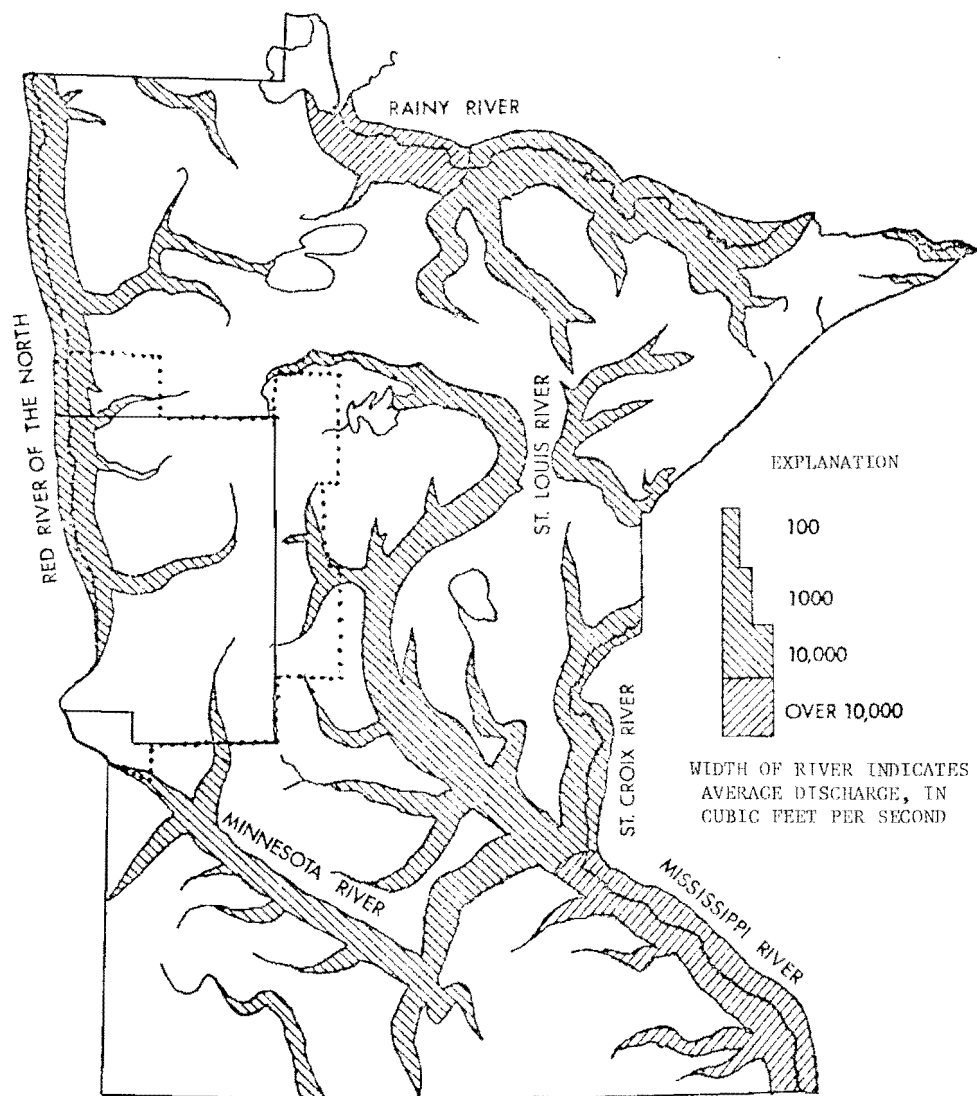


Figure 2. Major river systems originating in Minnesota and showing West Minnesota study area.

Local Governments

On January 1, 1967, the 14 West Minnesota counties accounted for 739 of the 4,184 local government units in Minnesota (table 3). For the 240,000 people in the area, the number of units per 1,000 persons was nearly three times the state average. A major factor for the difference in number was the lack of larger urban centers, coupled by the existence of many small school districts which had not yet consolidated. While the number of school districts is less now than in 1967, special districts are increasing in total number. Because of the sparsity of population and, hence, greater distances to local service centers, access to local government is not necessarily better for the majority of people than elsewhere in the State.

Of the 739 units of local government, the 119 municipalities, the 14 counties, and a majority of the 22 special districts are most concerned about natural resources. Municipalities operate the local water supply and wastewater treatment facilities, counties maintain roads, and special districts are organized for resource conservation and development purposes.*

The 119 municipalities are of particular concern in this study because of their responsibilities in providing water-related services in the area. A majority of the 119 municipalities have less than 500 people (table 4); they have a limited tax base for supporting a full range of municipal services. However, they are organized to build and operate water supply (84 municipalities) and wastewater treatment (73 municipalities) facilities.

The 14 counties (along with 343 townships) have a major responsibility in road construction and maintenance. The tax base for counties is substantially greater than for municipalities. However, the tax burden per \$1,000 of taxable value, or per \$1,000 of personal income, is high in the 14 counties (table 5).

Total local government effort in performing resource-related functions in West Minnesota required 10 percent of the full-time equivalent employment in 1967 (table 6).** Except for road construction and maintenance by counties and townships, municipal governments accounted for most of the resource-related, environmental services.

The 119 municipalities are identified, also, as trade and service centers (figure 3). The six largest municipalities are complete shopping centers, while several of the next largest municipalities are designated as partial shopping centers.*** Principal high-order social services are located in these centers; their service areas from the seven "functional communities" in West Minnesota.

* The natural resource-related special districts included 1 drainage and conservation, 14 soil conservation, and 4 watershed districts.

** An additional 1,563 and 1,178 FTE state and federal employees, respectively, are not included; also an additional 1,624 persons employed part-time are not included in this table.

*** The classification follows Barchert (see ref. 8).

Table 3. Local governments and population, by county, West Minnesota, 1967^{1/}

County	Land area square miles	Population 1967*	Counties	Munici- palities	Townships	School Districts	Special Districts	Total
West								
Big Stone	510	8,517	1	8	14	8	1	32
Clay	1,050	39,133	1	11	30	7	3	52
Grant	557	8,347	1	7	16	6	2	32
Norman	885	9,628	1	8	24	6	2	41
Stevens	570	10,636	1	5	16	4	1	27
Traverse	572	6,370	1	4	15	3	1	24
Wilkin	752	9,860	1	9	22	12	2	46
Total West	4,896	92,491	7	52	137	46	12	254
East								
Becker	1,315	24,965	1	7	35	6	3	52
Douglas	637	21,826	1	11	20	23	1	56
Hubbard	932	9,166	1	4	26	12	0	43
Otter Tail	2,000	47,265	1	20	62	83	3	169
Pope	681	10,266	1	9	20	9	1	40
Todd	947	22,259	1	10	28	53	1	93
Wadena	536	11,494	1	6	15	9	1	32
Total East	7,048	147,241	7	67	206	195	10	485
Total Area	11,944	239,732	14	119	343	241	22	739
Total Minn.	80,009	3,582,000	87	850	1,817	1,282	148	4,184

^{1/} Minnesota Department of Health, Selection of Vital Statistics, reprinted in Minnesota Economic Data, Counties and Regions. Number 14, prepared by Department of Agricultural Economics, Agricultural Extension Service and Agricultural Experiment Station cooperating - University of Minnesota, February 1969.

* U.S. Bureau of the Census, Census of Governments 1967, Volume 7, Number 23, Minnesota, table 29, p. 40.

Table 3. (Continued)

County	Local gov'ts per 1,000 population	Local gov'ts per 1,000 square miles
West		
Big Stone	3.75	62.7
Clay	1.32	49.5
Grant	3.83	57.4
Norman	4.25	46.3
Stevens	2.53	47.3
Traverse	3.76	41.9
Wilkin	4.66	61.1
Total West	average 2.74	51.8
East		
Becker	2.08	39.5
Douglas	2.56	87.9
Hubbard	4.69	46.2
Otter Tail	3.57	84.5
Pope	3.89	58.7
Todd	4.17	98.2
Wadena	2.78	59.7
Total East	average 3.27	68.8
Total Area	average 3.06	61.8
Total Minn.	average 1.16	52.2

Table 4. Distribution of total municipal population in specified size classes, by county, West Minnesota, 1970^{1/}

County	Size class of municipality						Total municipal
	A 10,000 and over	B 2,500 to 9,999	C 1,000 to 2,499	D 500 to 999	E 200 to 499	F Less than 200	
West							
Big Stone	----	2,655 (1)	----	1,343 (2)	366 (1)	394 (4)	4,768 (8)
Clay	29,687 (1)	----	5,474 (3)	674 (1)	1,051 (3)	454 (3)	37,340 (11)
Grant	----	----	1,484 (1)	1,246 (2)	1,004 (3)	137 (1)	3,871 (7)
Norman	----	----	2,076 (1)	1,466 (2)	836 (3)	277 (2)	4,655 (8)
Stevens	----	5,366 (1)	----	806 (1)	707 (2)	140 (1)	7,019 (5)
Traverse	----	----	2,029 (1)	906 (1)	204 (1)	167 (1)	3,306 (4)
Wilkin	----	4,200 (1)	----	----	787 (2)	734 (6)	5,721 (9)
Total West	29,687(1)	12,231 (3)	11,063 (6)	6,441 (9)	4,955 (15)	2,303 (18)	66,680 (52)
East							
Becker	----	5,797 (1)	1,015 (1)	658 (1)	766 (3)	58 (1)	8,294 (7)
Douglas	----	6,973 (1)	1,306 (1)	553 (1)	982 (3)	812 (5)	10,626 (11)
Hubbard	----	2,772 (1)	----	----	776 (2)	154 (1)	3,702 (4)
Otter Tail	12,443(1)	----	3,758 (2)	3,295 (4)	1,067 (4)	1,346 (9)	21,909 (20)
Pope	----	2,584 (1)	1,138 (1)	----	986 (4)	222 (3)	4,930 (9)
Todd	----	2,657 (1)	2,416 (1)	2,333 (4)	325 (1)	404 (3)	8,135 (10)
Wadena	----	4,640 (1)	----	2,073 (3)	----	149 (2)	6,862 (6)
Total East	12,443(1)	25,423 (6)	9,633 (6)	8,912 (17)	4,902 (17)	3,145 (24)	64,458 (67)
Total area	42,130(2)	37,654 (3)	20,696(12)	15,353 (22)	9,857 (32)	5,448 (42)	131,138 (119)

^{1/} Number of municipalities of given size class shown in parenthesis.

Table 5. Personal income, population, local direct revenue and burden of local government, by county and subarea, West Minnesota, 1967^{1/}

County	Per capita taxable value	Per capita personal income	Population	Total personal income	Local direct revenue	Burden*
	dollars	dollars	number	...thousands of dollars...		dollars
West						
Big Stone	797	1,808	8,517	15,399	1,757	11.41
Clay	595	2,337	39,133	91,454	7,814	8.54
Grant	741	1,755	8,347	14,649	1,684	11.50
Norman	749	1,880	9,628	18,101	2,052	11.34
Stevens	777	1,998	10,636	21,251	2,104	9.90
Traverse	950	2,242	6,370	14,282	1,454	10.18
Wilkin	808	2,084	9,860	20,548	1,836	8.94
Average West	711	2,116	Total 92,491	195,684	18,701	Average 9.56
East						
Becker	506	1,400	24,965	34,951	3,347	9.58
Douglas	542	1,842	21,826	40,203	3,405	8.47
Hubbard	547	1,590	9,166	14,574	1,463	10.04
Otter Tail	541	1,688	47,265	79,783	6,693	8.39
Pope	732	2,034	10,266	22,915	1,982	8.65
Todd	382	1,346	22,259	29,961	2,969	9.91
Wadena	412	1,712	11,494	19,678	1,771	9.00
Average East	511	1,633	Total 147,241	242,065	21,630	8.94
Average of total area	588	1,818	Total 239,732	437,749	40,334	Average 9.00

^{1/} Sum of county totals may not equal area totals because of rounding.

* Local direct revenue per \$100 total personal income.

Table 6. Full-time equivalent employment in specified functions, by local government, West Minnesota, 1967.

Function	County and township (number)		School district	Special district	Total
	Municipal	township			
Social:					
Education	0	14	4,635	0	4,649
Libraries	29	0	0	0	29
Health	32	17	0	0	49
Hospitals	266	217	0	0	483
Welfare	0	225	0	0	225
Recreation	35	0	0	0	35
Total	362	473	4,635	0	5,470
Environmental:					
Highways	90	469	0	0	559
Housing	8	0	0	3	11
Sewerage	43	0	0	0	43
Other sanitation	69	0	0	0	69
Water supply	80	0	0	0	80
Other local utilities	107	0	0	0	107
Natural resources	0	24	0	21	45
Total	397	493	0	24	914
Administrative:					
General control	71	206	0	0	277
Financial adm.	50	136	0	0	186
Police protection	156	74	0	0	230
Fire protection	38	0	0	0	38
Corrections	0	9	0	0	9
Total	315	425	0	0	740
Other	52	270	0	0	322
All functions	1,126	1,661	4,635	24	7,446

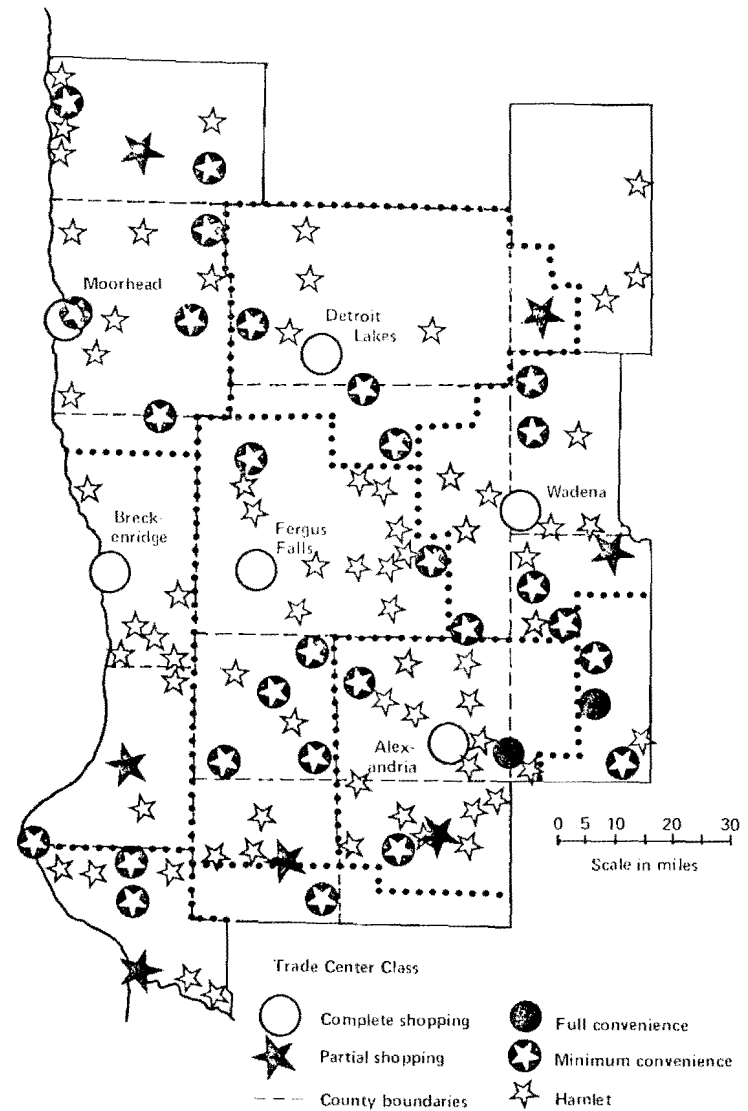


Figure 3. Service areas of trade centers, (within dotted lines) West Minnesota, 1967

Problem Areas*

The study findings are directed towards a series of problem areas in environmental planning and water resource development. A total of nine areas are identified with reference to related local government functions as follows:

1. Water supply: location, financing, construction and operation of wells, storage reservoirs, treatment plants, collection works, transmission mains, and distribution works (1,14,15,16,28,32,41,42,43,44);
2. Wastewater treatment and sewers: location, financing, construction and operation of wastewater treatment plants, sanitary sewer collection systems, and storm sewer systems (1, 4a,11,20,25,25a,33, 34,52,54,64,71,80);
3. Solid waste collection and disposal: location, financing, construction and operation of garbage collection, disposal and treatment facilities (51);
4. Flood control: location, financing, construction, and operation of dams and administration of flood plain zoning and subdivision regulations (37c);
5. Land treatment and drainage: soil conservation, land drainage and related capital improvements planning and facility construction and maintenance;
6. Irrigation: location, financing, construction and operation of underground and surface irrigation facilities for agricultural purposes;
7. Recreation: location, financing, construction and operation of local and regional recreation areas and related public facilities;
8. Power: location, financing, construction and operation of electric power generating facilities;
9. Planning and development: organization, staffing and maintenance of local and regional development planning functions, including construction of major installations (3,12,25a, 53).

Each of the nine problem areas in resource development is water-related in some degree at least. These nine areas, moreover, are of immediate concern, not only to municipal, township and county government units, but, also, to the West Minnesota (WesMin) Resource Conservation and Development Project Committee. The WesMin Project Committee, which includes representation from the Boards of Commissioners of the seven counties in the study area, prepared a work plan in 1972 where specified project proposals are identified. These proposals are grouped by function, sponsor and priority in table 7.

* Problem area groupings include the basic community facilities studied by the Joint Economic Committee (see ref. 73b).

Table 7. Natural resource-related projects proposed for funding by WesMin Resource Conservation and Development Project Committee, 1972

Item	Estimated cost		Assistance				FY 1973 Budget				Total	
	Annual	Total	Tech- nical	Finan- cial	Local		Federal		Other			
					Private	Public	State	D		RC and		
Function: ^{1/}												
Water supply	0	1,485	0	0	0	0	0	0	0	0	0	0
Wastewater treatment	932	9,600	0	21	0	451	2	15	7	457	3,729	
Solid waste disposal	41	40	0	0	0	0	40	0	0	1	41	
Flood control	5	1,318	0	14	0	0	0	0	4	1	5	
Land treatment & drainage	451	9,266	41	154	0	38	118	40	225	30	451	
Irrigation	136	10,778	0	3	0	31	0	38	4	63	136	
Recreation	189	8,209	20	78	0	19	44	19	17	84	183	
Power	10	510	0	0	0	0	0	0	0	10	10	
Planning & Development	451	168,684	0	0	0	7	6	8	422	8	451	
Sponsor: ^{2/}												
State	1	213	0	0	0	0	0	1	1	0	1	
County	119	2,042	0	2	0	13	33	10	46	17	119	
Township	38	5,030	0	0	0	30	0	5	1	2	38	
Municipal	153	6,933	20	69	10	10	116	5	7	15	153	
Other local government	266	17,211	40	41	44	44	33	12	126	51	266	
Community development group	1,075	39,883	0	48	440	440	7	74	60	487	1,068	
Civic organization	56	1,015	0	1	0	0	1	0	1	55	57	
Sports organization	99	1,040	1	49	2	2	18	12	42	25	99	
Private industry	408	136,523	0	0	7	7	2	1	396	2	408	
Priority: ^{2/}												
1 to 14	193	5,019	61	145	15	15	11	14	130	53	223	
Unspecified ^{3/}	2,022	204,871	0	65	531	199	199	106	549	631	2,016	
Totals	2,215	209,890	61	210	546	210	210	120	679	684	2,239	

^{1/} Based on data presented in 1972 Work Plan for West Minnesota Resource Conservation and Development Project.
^{2/} Refer to totals listed in bottom line for each group of items.
^{3/} Total of 75 proposed projects.

Of the total of nearly \$210 million (for 193 project proposals), the largest allocation is for urban-industrial expansion. Several of the projects in this category are highly speculative and indeed one proposal (i.e., Minnesota Experimental City) has been rejected by both the project board and the State. The proposed capital improvements under the water supply and wastewater treatment functions thus account for a substantial part of the funding exclusive of the more speculative proposals. These proposals typically are sponsored by a municipal government or a community development group. However, none of the proposals under the two water-related functions were listed among those of highest (1 to 14) priority.

Because the WesMin Resource Conservation and Development Project is not an integral part of county or municipal government, the list of project proposals may lack status and credibility in securing requested funds. The project staff are unlikely to relate effectively to both sponsoring and funding organizations as long as they are not also an integral part of a regional planning function. Expansion of county membership to include all counties in Minnesota Planning Regions 2, 4, 5 and 6E extends the geographic scale of planning without necessarily extending the scope and substance of the resource planning functions, especially with reference to all of the nine problem areas cited earlier.

Planning Systems

A resource planning focus for the study is provided in the concept of a hierarchy of planning and development regions. The multi-county environmental planning area is a primary level for planning and provision of essential social, environmental and governmental services which enhance the quality of life for local residents. The grouping of multi-county areas into a economic development region is another level of public planning, but the primary concern here is the viability of the region's economic base and its export-producing, primarily private sector, activities.

Environmental Planning Area

The nine-county Minnesota Planning Region 4 provides one set of territorial limits for multi-county environmental planning in West Minnesota.* Within these territorial limits are important subregional planning units, namely, watersheds and functional communities.

* Planning Region 1 (Kittson, Roseau, Marshall, Pennington, Red Lake, Polk and Norman counties), PR 2 (Lake of the Woods, Beltrami, Clearwater, Hubbard counties), PR 5 (Wadena, Cass, Crow Wing, Todd and Morrison counties), and PR 6W (Big Stone, Swift, Lac qui Parle, Brown and Yellow Medicine counties) provide other multi-county groupings which include one (PR 1, PR 2 and PR 6W) or two (PR 5) counties from the 14-county study.

The nine-county region covers all or part of 10 watershed units of which 4 flow into the Red River and 3 each flow into the Minnesota and Mississippi Rivers, respectively. Planning Regions 1 and 2 cover the remaining 4 Minnesota watershed units in the Red River Basin (figure 4).

All or part of the seven functional community units identified earlier (see figure 3) are included in Region 4. These units are service areas for a major social service, namely, hospitals and medical care. They delineate other service areas, too, and they identify groupings of rural communities within the commuting areas of the principal shopping centers in the region.

The boundaries of the watershed unit (WU) and the community unit (CU) are not coterminous with the planning region boundaries. Nevertheless, the Region 4 resource planning functions will involve these spatial basic building blocks. The two sets of building blocks may be involved also in more extensive statewide planning functions (e.g., those of the Minnesota Department of Natural Resources and the Minnesota Department of Health).

The Regional Commission provides the organizational umbrella for bringing together the watershed and community concerns as they relate to (1) the local environment and (2) the local resident (including seasonal and week-end residents). The territorial boundaries of the umbrella organization are somewhat arbitrary in terms of spatial distributions of resources and people. This does not detract, however, from the effective exercise of planning, police, taxing and spending powers which may be delegated to Regional Commission. The two sets of building blocks may use other organizational channels, including the ones cited earlier, in pushing particular environmental or societal viewpoints.

Citizen and professional task forces in critical problem areas represent an additional approach in the regional planning process. Geographical representation on each task force could be specified in terms of watershed or community units. Because of the focus on people and access to and relationships with essential services, however, the CU emerges as an appropriate geographical unit for area task force organization.

An area resource planning thrust to the study occurs also in the delineation of the nine problem areas cited earlier. With reference to Problem Area 2, for example, data are available from the Minnesota Pollution Control Agency (MPCA) reports which show that for a large majority of municipal service systems (50 treated and 33 untreated), rivers are the final place of disposal for both treated and untreated sewage (52)*. Data on the extensive use of lakes and soil for the disposal of wastewater from individual business and residential units outside municipalities, however, are not available.

Much of the untreated wastewater originates in small municipalities (table 8). The larger municipalities depend largely on secondary treatment. For most of the larger municipalities, the secondary facilities have been constructed since 1946 (although the first sewers for these municipalities were built before 1921). However, a substantial part of the popula-

* Lakes are used for 16 treated and 18 untreated systems, while 3 treated systems use soil and 4 treated systems use ditches.

Figure 4. Watershed units in Minnesota and West Minnesota Study Area.

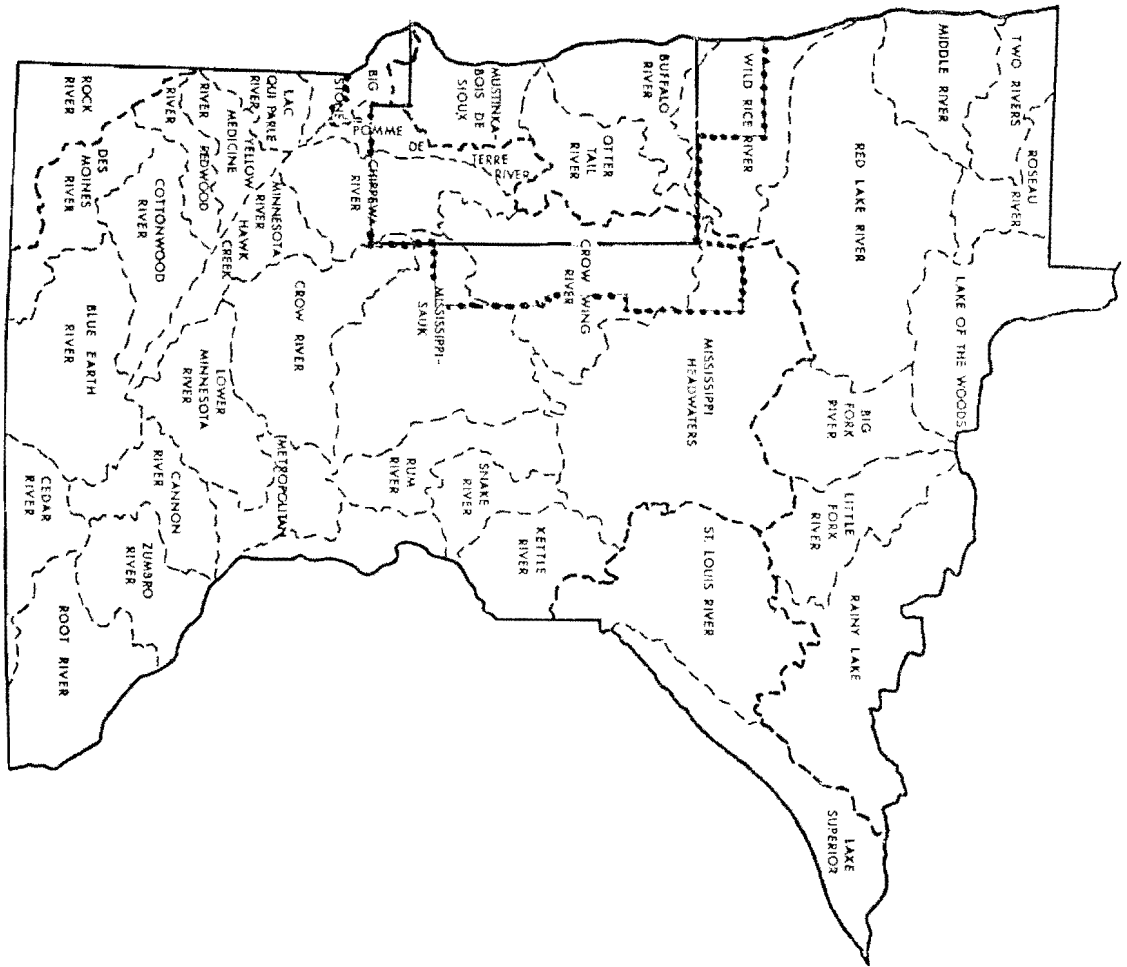


Table 8. Total population and municipalities with specified status of wastewater treatment facilities and sewers, West Minnesota, 1970-71.

Size Class	Level of wastewater treatment				Sewers were built before 1921	Wastewater treatment facilities were built before 1946
	Primary	Secondary	Tertiary (number)	None		
Under 200	52 (1)	1,325 (8)	156 (1)	3,915 (32)	171 (1)	52 (1)
200-499	1,684 (5)	4,827 (15)		3,346 (12)	455 (1)	977 (3)
500-999		15,353 (22)			5,190 (7)	2,314 (3)
1000-2499	1,371 (1)	19,325 (11)			10,980 (6)	5,938 (3)
2500-9999		31,857 (8)	5,797 (1)		28,000 (6)	7,305 (2)
10,000 and over		42,130 (2)			42,130 (2)	12,443 (1)
Total	3,107 (7)	114,817 (66)	5,953 (2)	7,261 (44)	86,926 (23)	29,029 (13)

tion resides in municipalities which require additional improvements in existing sewers and treatment systems.

The MPCA is establishing a priority ranking system for the issuance of sewage facility construction permits under the National Pollutant Discharge Elimination System (NPDES) and it has initiated a multi-level (area, region and state) planning process for the disposition of all residual wastes from point sources. The State has been divided into 10 basins and the Twin Cities Metropolitan Area and within each basin or area all streams are divided into segments. Each stream segment is identified by its pollution status and ranked according to the severity of pollution, the affected population, the need for pure water, and national priorities. Since the Minnesota share of federal funding under the 1972 Federal Water Pollution Control Act (approximately \$101.5 million) is less than half of the \$212 million in total requests received by April 1973 for such funding, use of a statewide priority ranking systems is inevitable.

A majority of municipalities in Region 4 and West Minnesota lack the population base, and, hence, funding eligibility, to acquire the needed federal funding in competition with major urban centers. The population factor alone, which translates into a population growth factor, weighs heavily against the small outstate community in acquiring additional sources of financing to supplement funds acquired locally. Organization of county sewer districts and use of the generally superior status of the county or largest urban centers offers one alternative to the acquisition of public funds for needed capital improvements.

The fiscal status of the small municipality is illustrated by three case studies by Nelson (52). Two small municipalities--Carlos (population 260) and Underwood (population 278) recently built secondary treatment plants and sewers (table 9). During the construction period, the Federal government was allowed to fund up to 55 percent of the construction costs for the sewage treatment plant and the state was allowed to match federal funds with a 15 percent grant. Richville (population 102), on the other hand, lacks sewage facilities, but if it were to build these facilities, it could acquire a 75 percent federal grant and a 25 percent state grant, leaving the municipality with an indebtedness for sewer construction only. The annual cost per capita for the improvements would not be as great as in the two larger municipalities, but municipal revenues and outlays would need to increase greatly relative to current levels.

On-site treatment facilities may provide an alternative disposal system for dwelling units in the small municipality. These alternatives range from the traditional septic tank, with accompanying soil absorption field, to the elevated drainage field (e.g., Gopher Mound) or, alternatively, the pumping station for moving effluent to another more suitable nearby treatment site (table 10). However, the per capita costs for the alternative on-site systems are substantially higher than for municipal systems. A cooperative approach to the financing and management of the on-site facilities may offer one means of acquiring needed technical and financial assistance for reducing the user costs of the alternative on-site treatment systems.

Table 9. Estimated sewage facility costs for selected municipalities, West Minnesota, 1970^{1/}

Item	Carlos	Underwood (dollars)	Richville
Total cost	190,000	175,000	64,000
Treatment plant sewers	104,285 85,715	88,870 86,430	30,000 34,000
Total grants	73,000	62,000	30,000
Federal	57,357 (55%)	48,713 (55%)	22,500 (75%)
State	15,643 (15%)	13,287 (15%)	7,500 (25%)
Indebtedness ^{2/} for facilities	117,000	113,000	34,000
Annual cost ^{3/}	10,998	10,709	3,470
Debt retirement	8,498	8,209	2,470
Operation and maintenance	2,500	2,500	1,000
Per dwelling unit	120	92	80
Per capita	42	38	33
Per \$100 of municipal revenues	34	53	143

^{1/} Estimates based on data from the Minnesota Department of Taxation.

^{2/} Indebtedness figures from Minnesota Public Examiners reports.

^{3/} Annual cost, 30 years at 6%.

Table 10. Cost comparisons of on-site treatment systems

Cost Item	Septic tank with soil absorption fields		Gopher mound ^{2/}	Pumping station ^{2/}
	Good soil	Poor soil (dollars)		
Equipment, total	200	200	760	300
Installation, total	450	850	800	500
Operating, annual	---	---	5	5
Maintenance, annual	10	10	0	5
Total annual	80	161	152	85
Total, per person	20	42	38	21

^{1/} Based on estimates prepared by R.J. Otis, Agr. Ext. Service, University of Wisconsin, Madison.

^{2/} Based on estimates prepared by Roger E. Machmeit, Department of Agricultural Engineering, University of Minnesota, St. Paul.

Still another set of financing problem is encountered by the larger municipality, such as Alexandria (population 6,973), which has an extended service area and is located in a complex drainage system. In 1970, Alexandria and five neighboring townships initiated a feasibility study of a regional sanitary district. The recommended system included one new treatment plant and a spray irrigation system for disposal of treated effluents.* Total cost was estimated \$7.9 million, or \$21 per year per capita (based on 30-year life and 6 percent interest). An Alexandria Lake Sanitary District was created in 1971 by a special act of the Minnesota Legislature to enable the local leadership to implement the study recommendations. However, the proposal was defeated (i.e., the Minnesota Pollution Control Agency did not allow the permit) by a citizen opposition group which alleged that the area would be adversely affected in its public health and sanitation by the proposed facilities, particularly the field irrigation system.

The proposed Alexandria Sanitary Lake District covers only a small part of a watershed unit (WU). The particular lake system makes up the southwest extremity of the Crow Wing River WU, which borders the Cheppewa River WU near Alexandria (see figure 2). A major part of the Crow Wing River WU lies outside Region 4 in two bordering planning regions. The adverse ecologic impacts of untreated sewage in the Alexandria Lake District are the concern of both local residents and those living elsewhere in the WU.

Extending administrative control to the entire area of impact does not translate directly into favorable citizen support for a particular development proposal regardless of its economic logic. Substantive differences in both perceptions and values occur among the citizens of a given political or administrative jurisdiction which require widespread and active citizen participation in the entire resource development process from its earliest stages to the time when the popular vote is counted for and against the proposal. Nevertheless, for at least part of the WU, the Region 4 area organization provides a potential clearinghouse and forum for citizen involvement in the entire resource planning process. However, the function of resource planning must be perceived fundamentally as a learning process rather than one of public relations and indoctrination in particular professional viewpoints and values (18,27,60).

Envisioned as part of the Region 4 organization is a Regional Waste Management Agency (RWMA) which would have responsibility for planning, siting and supervising all public waste treatment and disposal facilities in the region. Where a WU extended into a neighboring region, its activities,

* A regional sanitary district was to (1) adopt a comprehensive sewage works plan for the provision of sewage service to the entire region, (2) design and construct the primary systems of major trunk sewers and treatment plants, (3) operate and maintain the regional collection, distribution and treatment facilities, (4) provide water quality monitoring and pollution surveillance in cooperation with MPCA, (5) adopt and administer applicable pollution control ordinances, (6) coordinate all water pollution control activities, and (7) undertake such other action as citizens requires.

capital improvement proposals in the WU would be reviewed and coordinated by both regional agencies, although the primary responsibility for the proposal would remain with one of the regional agencies. (Other resource units may be delineated for dealing with solid and gaseous wastes to which the same procedures would apply.)

Priority ranking procedures would be prepared by each RWMA in the State in accordance with state and federal guidelines and these procedures would be applied in the review of all capital improvements proposals. Thus, the RWMA would provide a means of decentralizing the funding process from federal and state to local levels of government. At the same time, the watershed unit would become the primary organization for initiating, building and operating local waste management systems.

Economic Development Region

For purposes of basic economic development, the nine-county planning region or the 14-county study area lack the large population agglomerations which are essential to self-sustaining urban-industrial growth. By combining Region 4 and West Minnesota with Regions 1 and 2 in Minnesota and four multi-county planning regions in eastern North Dakota, a new geographic entity is formed which focuses on an urban-industrial complex of 100,000 people, (i.e., the Fargo-Moorhead Metropolitan Area). This region has a more diverse resource base and occupational mix than either Region 4 or West Minnesota and it has, also, a focal area with most high-order services (i.e., higher education, major medical centers and financial institutions, and other specialized functions) sought by households and businesses in the region. Altogether, more than 600,000 people now reside in this multi-area Fargo-Red Economic Development (FRED) Region which straddles the Red River of the North along the entire Minnesota-North Dakota border.

Two OBE (U.S. Office of Business Economics) Economic Areas--Grand Forks (84) and Fargo (89)--cover much of the FRED Region (figure 5). Five additional OBE Economic Areas account for the remaining counties in the extended region. These multi-county areas, unlike the smaller planning regions, focus on larger urban centers, typically of metropolitan status. To form the FRED Region, however, the entire Basin is included, along with those counties where residents look more to the Fargo-Moorhead Metropolitan Area than to Duluth-Superior or Minneapolis-St. Paul metropolitan areas for essential, especially the high-order, services.

Within the FRED Region a counterpart of the Souris-Red-Rainy River Basins Commission is envisioned which would have a major concern for the overall economic health of the total region. Somewhat as in Region 4, the establishment of a Regional Environmental Protection Agency (REPA) is envisioned. This agency would have responsibility in protecting environmentally critical areas from harmful development and in encouraging pollution abatement practices generally through the use of tax and investment incentives and use/performance regulations.

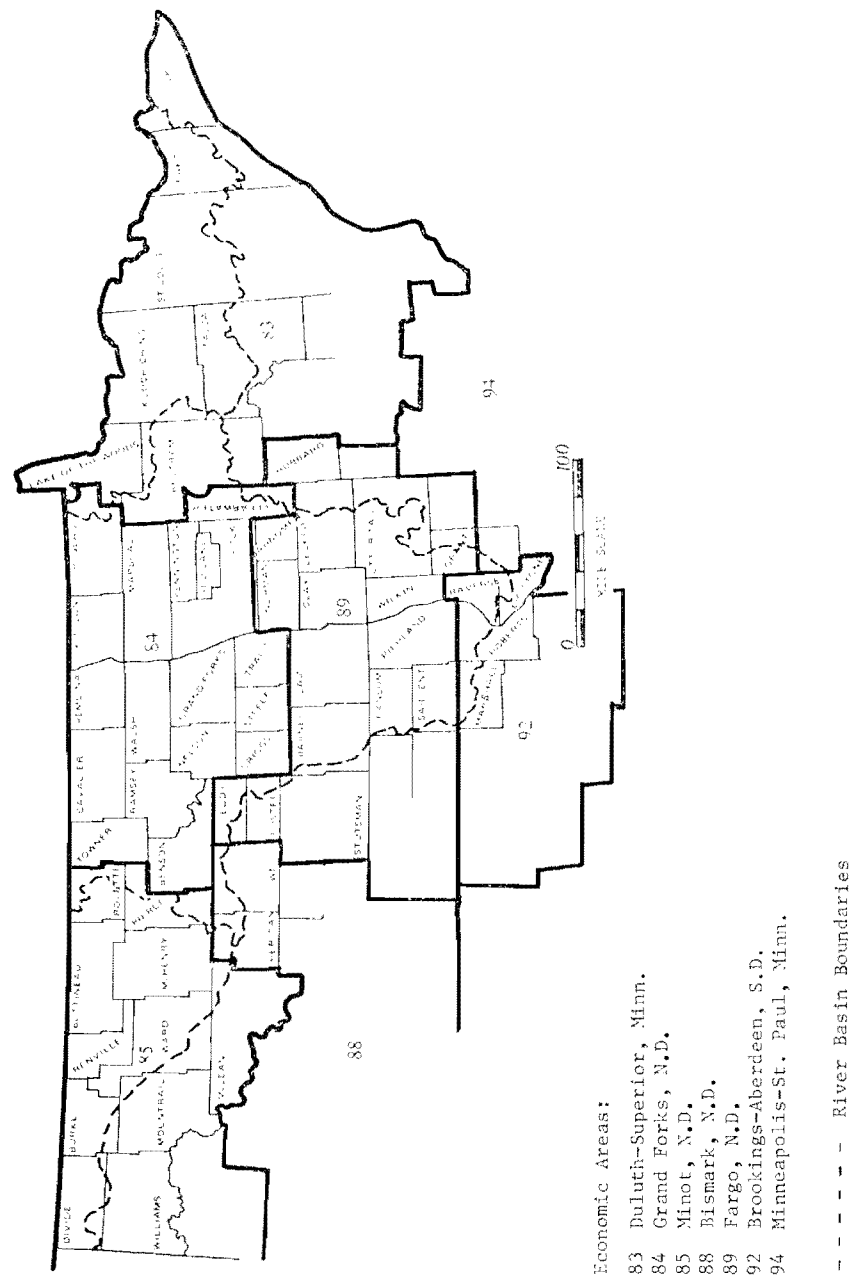


Figure 5. OBE Economic Areas Souris-Red-Rainy Region

EMPLOYMENT TRENDS

For assessing long-run impacts of industry change on water resource development in a multi-county area, sources of employment change are identified and analyzed. Total employment of the area is broken down into two main categories--commodity-producing and noncommodity producing. The commodity-noncommodity breakdown corresponds roughly with an export-residential split, with the export-producing group being those persons engaged in the production of goods and services for customers residing outside the area. Because the export industries bring dollars into the area, which is an absolute necessity in a specialized, exchange economy, they frequently are the area building industries. Residential industries, because they serve the resident population, both business and household, are the area-serving industries.

Commodity-Producing Industry

Because commodity-producing employment is roughly equivalent to export-producing employment, resource requirements for export industry in West Minnesota are viewed as primarily a function of two general considerations--the national growth experience of each industry and the area differentials from the specific national growth rates. On the one hand, the overall level of national economic activity--exemplified by the gross national product, established the general level of economic activity. On the other hand, area differentials in resource productivity result from differences in the proportion of industries of above-average or below-average growth.

If the overall national rate of increase in industry employment over the 1950-1960 and 1960-1970 periods had prevailed in West Minnesota, total commodity-producing employment would have increased by 8,271 from 1950 to 1960 and by 7,994 from 1960 to 1970 (table 11). However, an adverse industry mix, i.e., a disproportionate share of below-average growth industries, by itself resulted in a more than 20 percent decline in commodity-producing employment during the first period and a much larger decline in the second period.

Besides the national growth and industry mix effects, an area-share effect, i.e., area-to-area difference in a given industry's growth, is identified as another important source of area employment change. Differences among areas occur because of differences in the competitive position of area industries. For West Minnesota, an overall positive area-share effect reduced the full impact of the adverse industry-mix effect during the 1950-1960 period. However, during the 1960-70 period, the area-share effect was negative, too, which resulted in a substantial decline in total area employment in the commodity-producing industries.

To illustrate local, i.e., intra-area, differences in commodity-producing industry trends, the national-growth, industry-mix and area-share effects are examined individually for each industry (table 12). Since the combined national-growth and industry-mix effects if the derived change in a specific county-level industry based on the national rate of change for that

Table 11. Employment change in specified commodity-producing industry groups, by source of change, 1950-1970.

Industry Group	Change, 1950-60			Change, 1960-70							
	1950	National Growth	Industry Mix	Area Share	Total	1960	National Growth	Industry Mix	Area Share	Total	1970
Agriculture ^{1/}	44,412	6,875	-23,726	3,808	-13,042	31,370	5,946	-11,517	-7,261	-12,832	18,538
Mining	162	25	-72	33	-14	148	28	-41	37	24	172
Construction	4,779	740	-114	-703	-78	4,701	891	159	-615	436	5,137
Manufacturing:											
Food Products	1,750	271	296	578	1,145	2,895	549	-580	-480	-512	2,383
Textile, apparel prod.	137	21	-51	20	-10	127	24	-23	357	359	486
Lumber, wood prod.	654	101	-139	5	-53	601	114	-83	-63	-32	569
Printing/publish	733	113	164	-27	250	983	186	-29	-253	-95	888
Chemicals, allied prod.	88	14	17	-26	5	93	18	2	-37	-17	76
Machinery	225	35	80	23	138	363	69	32	77	178	541
Transportation equipment	68	10	-11	325	324	392	74	27	18	120	512
Other mfg.	428	66	28	-23	71	499	95	-16	1,027	1,106	1,605
Total manuf.	4,083	631	364	875	1,870	5,953	1,129	-670	646	1,107	7,060
All commodity-producing	53,436	8,271	-23,548	4,013	-11,264	42,172	7,994	-12,069	-7,192	-11,265	30,907

^{1/} Includes agricultural services, forestry, fisheries.

Table 12. Commodity-producing employment change in specified counties, by source of change, West Minnesota, 1950-1960 and 1960-1970.

County	Change, 1950-1960				Change, 1960-1970				Total
	Non-area factors	Agri-culture (incl. for., and fish)	Manufac-turing	Total	Non-area factors	Agri-culture (incl. for., and fish)	Manufac-turing	Total	
West:									
Big Stone	-542	201	63	87	-455	-170	8	-45	-215
Clay	-860	324	155	489	-371	-94	-91	-712	-806
Grant	-690	159	3	96	-594	-206	23	-395	-601
Norman	-1,013	130	3	46	-967	-287	109	-352	-639
Stevens	-664	179	-24	124	-540	-183	16	-74	-257
Traverse	-581	151	37	165	-416	-170	-22	-305	-475
Wilkin	-627	265	31	240	-387	-199	5	-329	-528
Total	-4,977	1,419	268	1,247	-3,730	-1,309	48	-2,212	-3,521
East:									
Becker	-1,503	207	7	316	-1,187	-343	14	-962	-1,305
Douglas	-1,276	237	-112	184	-1,089	-321	105	76	-245
Hubbard	-593	1	2	36	-557	-102	-55	-597	-699
Ottertail	-3,488	280	-108	76	-3,240	-886	231	-1,303	-2,189
Pope	-902	476	-16	530	-372	-291	127	-443	-734
Todd	-1,857	1,014	-21	279	-585	-619	36	-1,286	-1,905
Wadena	-686	175	17	177	-509	-191	69	-466	-657
Total	-10,305	2,390	-231	2,763	-7,539	-2,753	600	-4,981	-7,734
All Counties	-15,277	3,808	-670	4,013	-11,264	-4,074	646	-7,192	-11,265

1/ Totals may not equal sum of parts because of rounding.

industry, the area-share effect becomes a residual estimate that represents the differences between the derived employment change based on the national rate and the actual employment change for the local industry. The area-share effect is viewed, therefore, as a measure of the competitive position of the industry. Thus, a positive area-share effect denotes above-average growth for a specific industry and a negative area-share effect denotes below-average growth.

Noncommodity-Producing Industry

Noncommodity-producing industry includes both the industry-serving and household-serving activities which relate entirely to area markets. These activities account for a major source of employment in every county in West Minnesota (table 13). Six of every 10 jobs in West Minnesota are noncommodity-producing industries.

When employment change in noncommodity-producing industries is examined in terms of the national effects and differential local effects, it is clear that West Minnesota industry failed to keep pace with national growth in noncommodity-producing industry in the 1950's (table 14). The adverse area-share effects reduce employment growth to below-average levels. In the 1960's however, the trend was reversed because of the growth of trade and service employment in the FMMA, i.e., Clay county.

A major factor in restricting the growth of noncommodity-producing industry has been lagging growth in commodity-producing industry in West Minnesota. To evaluate the impact of the area economic base upon its resource requirements and residentiary activities, the ratio of total-to-noncommodity-producing employment (i.e., the employment multiplier) for the 1950 to 1970 period has been computed for each county in West Minnesota (table 15). Generally, the west counties show a larger employment multiplier than the east counties, which relates to the generally higher household and farm income levels in the seven west counties.

Emerging from an analysis of the relationship of the commodity-producing employment multiplier are the conclusions that (1) the employment multiplier is increasing, (2) the county-to-county differences in the multiplier point to certain employment impacts of changes in regional production and settlement patterns and (3) the differential noncommodity-producing employment changes (area-share effects) are re-enforced by proportional employment changes (combined national-growth and industry-mix effects) in commodity-producing industry. Thus, for some counties, a slight noncommodity-producing employment increase is overshadowed by a large commodity-producing employment decrease. For other counties, a much larger noncommodity-producing employment increase was retained because of only a slight decline in commodity-producing employment.

Table 13. Noncommodity-producing employment change in specified counties, by source of change, West Minnesota, 1950-1960 and 1960-1970.^{1/}

County	Change, 1950-1960						Total	Total
	Non-area factors	Transportation	Communications, utilities	Trade	Finance ins., real estate	Other services		
West:								
Big Stone	384	-40	19	-116	-38	-219	-394	-10
Clay	1406	99	268	486	204	721	1778	3184
Grant	321	-70	-12	-97	-21	-250	-450	-129
Norman	400	-81	-35	-205	-5	-220	-546	-146
Stevens	435	-59	1	-167	-37	-199	-461	-26
Traverse	268	-16	18	-228	-9	0	-235	33
Wilkin	219	-47	-4	-21	4	82	14	233
Total	3433	-214	255	-348	98	-85	-294	3139
East:								
Becker	782	70	29	-294	-49	-339	-643	139
Douglas	829	-5	-62	-210	13	-255	-519	310
Hubbard	388	-5	-10	-102	30	-237	-334	54
Ottertail	1876	-132	-26	-607	21	-513	-1257	619
Pope	332	-23	2	-63	-29	-53	-166	166
Todd	609	-59	40	-159	6	-259	-431	178
Wadena	471	-26	-50	-195	3	114	-154	317
Total	5287	-180	-77	-1630	-15	-1602	-3504	1783
All Counties	5714	3	180	-1980	80	-1674	-3797	4917

^{1/} Totals may not equal sum of parts because of rounding.

Table 13. (continued)

County	Change, 1960-1970						Total	Total
	Non-area factors	Transportation	Communications, utilities	Trade	Finance Ins., real estate	Other services		
West:								
Big Stone	399	-3	-12	-170	56	-147	-276	123
Clay	2 273	36	-831	1530	104	1327	2166	4430
Grant	299	4	0	-162	19	46	-93	206
Norman	414	47	-32	-60	6	-238	-289	125
Stevens	483	-8	-14	-31	59	375	381	864
Traverse	307	-16	-21	-85	7	-127	-242	65
Wilkin	401	-36	-37	-18	-22	-187	-300	101
Total	4576	24	-947	1004	217	1049	1347	5923
East:								
Becker	814	-11	-85	97	14	270	285	1099
Douglas	952	-127	157	255	-29	31	287	1239
Hubbard	433	17	7	-23	-1	58	58	491
Ottertail	2107	72	135	339	-70	-532	-56	2051
Pope	414	-3	-27	62	39	-51	20	434
Todd	733	-55	-22	32	-59	-290	-394	339
Wadena	590	59	105	42	-27	-452	-263	327
Total	6043	-38	270	804	-133	-966	-63	5980
All Counties	10612	-16	-675	1807	83	85	1284	11900

Table 14. Employment change in specified counties noncommodity-producing industry groups, by source of change, West Minnesota, 1950-1970.

Industry Group	Change, 1950-60					Change, 1960-70					1970
	1950	National Growth	Industry Mix	Area Share	Total	1960	National Growth	Industry Mix	Area Share	Total	
(number)											
Infrastructure:											
Railroads, railway services	2,407	373	-1,106	-80	-812	1,595	302	-746	-61	-505	1,090
Trucking, warehousing	1,246	193	221	-235	178	1,425	270	-40	25	254	1,679
Other transportation	442	68	-41	-78	-51	391	74	-37	20	57	448
Communications	873	135	29	80	245	1,118	212	-105	-247	-141	977
Utilities, sanitary services	1,237	192	24	100	316	1,553	294	-32	-428	-166	1,387
Total infrastructure	6,205	961	-873	-213	-123	6,802	1,152	-960	-691	-501	5,581
Trade, finance:											
Wholesale; retail	14,910	2,308	-159	-1,980	169	15,079	2,858	-437	1,807	4,228	19,307
Financ, insur., real est.	1,309	203	384	80	661	1,976	375	128	83	586	2,562
Total trade and finance	16,219	2,511	225	-1,900	836	17,055	3,273	-309	1,809	4,814	1,869
Services:											
Hotels, personal	2,171	336	-178	106	264	2,435	462	31	-394	99	2,534
Private households	1,450	225	62	896	1,182	2,632	499	-751	-970	-1,224	1,408
Business repair	2,368	367	256	-1,230	-608	1,760	334	977	1,341	-30	1,730
Entertainment, recr.	599	93	-64	-171	-148	457	87	10	-35	62	519
Medical, other prof.	6,570	1,017	3,070	-1,106	-2,981	9,551	1,810	3,219	3,224	8,253	17,804
Public administration	2,111	327	328	-286	369	2,480	470	348	-163	654	3,134
Total services	15,269	2,365	3,479	-1,791	-420	19,315	3,662	3,764	321	7,814	27,129
All noncommodity producing	37,693	5,837	2,825	-3,903	4,760	42,453	8,047	2,493	1,520	11,672	54,579

Table 15. Total employment per 1,000 employed in commodity-producing industry group, West Minnesota, 1950, 1960 and 1970.

County	1950	1960	1970	Change	
				1950-60	1960-70
(number)					
West:					
Big Stone	1,786	2,025	2,303	239	278
Clay	2,375	3,219	4,963	844	1,744
Grant	1,601	1,744	2,391	143	647
Norman	1,518	1,677	2,039	159	362
Stevens	1,767	1,984	2,722	217	738
Traverse	1,619	1,830	2,347	211	517
Wilkin	1,808	2,136	2,754	328	618
Total	1,854	2,292	3,253	438	961
East:					
Becker	1,646	1,868	2,669	222	801
Douglas	1,768	2,098	2,569	330	471
Hubbard	1,735	2,015	3,285	280	1,270
Otter Tail	1,591	1,884	2,502	293	618
Pope	1,578	1,732	2,286	154	554
Todd	1,500	1,584	1,983	84	399
Wadena	1,844	2,240	3,176	396	936
Total	1,631	1,866	2,500	235	634
Area	1,707	2,012	2,766	305	754

INDUSTRY STRUCTURE

In this chapter, the interindustry transactions shown earlier in table 2 are expanded into a 29-sector tableau of the West Minnesota economy. The gross outputs of these 29 sectors are presented, along with their disposition among the purchasing sectors, including four final demand sectors in West Minnesota and one export sector (which accounts for sales to economic units residing outside the 14-county area).

As noted earlier, the interindustry transactions data for the West Minnesota economy are derived in part from field survey data and in part from secondary data. Survey data were used in deriving the gross output estimates for the eight manufacturing sectors, the disposition of these outputs among purchasing sectors, and the acquisition of inputs from producing sectors. For all other sectors, secondary data sources, which includes a recently completed input-output study of the Kansas economy, were used. In addition, the secondary data were used in the adjustment of all final demand estimates for the manufacturing sectors.

Economic indicators of the relative importance of each of the 29-sectors of the West Minnesota economy are presented in table 16. A measure of exports, together with a measure of employment, yield rough indications of the contribution of a particular industry to the area's economic base. According to these two indicators, agricultural employment accounts for approximately 26 percent of the total export-producing employment. All commodity-producing employment accounts for approximately 39 percent of the total while non-commodity producing employment accounts for the remaining 61 percent of the total export-producing employment.

Inclusion of both output and employment data in the same table may require additional clarification of the employment concept used in this chapter. Both output and employment is given by location of production rather than by residence of the employed population. This definition of employment thus differs from the definition of the employment used in the shift-share analysis cited earlier. In addition, certain sectors, (e.g., construction) are broken down into public and private employment.

A series of tables is presented in this chapter to illustrate both the internal and external linkages of the West Minnesota economy. Identification and measurement of these linkages represents a substantial part of the total effort involved in preparing the fiscal-ecologic accounts to use in assessing resource development potentials in the 14-county study area.

Interindustry Transactions

The structure of the West Minnesota economy is shown, first, in the sales and purchases of each of the 29 producing sectors (table 17). Shown, next, is the proportion of each dollar of total outlay used for specified industry inputs which are purchased from industries in the study area (table 18.) The third table, finally, shows the direct and indirect effects of a \$1 change in final demand for a given industry in the study area (table 19).

Table 16. Estimated gross output, employment, and output per worker in specified industry sectors, West Minnesota, 1967

Sector	Output (000\$)	Exports (000\$)	Employment (N)	Output/Emp (000\$)	Exports/ Output (\$)
1 Agr Livestock	171810	64910	10443	16.4522	.3778
2 Crops	168631	109484	10442	16.1493	.6493
3 Serv for FIS	15027	3448	1503	9.9980	.2295
4 Mining Construct	97113	2331	4610	21.0657	.0240
5 Manu Meat Prod	43217	35108	708	60.9549	.8124
6 Dairy Prod	97014	91789	1032	94.0058	.9461
7 Food Feed	30962	4002	704	43.9801	.1293
8 Lumber Furn	7415	6578	289	25.6574	.8871
9 Printing	6928	0	483	14.3437	.0000
10 Stone Clay	6559	1870	353	18.5807	.2852
11 Machinery	3852	0	386	9.9793	.0000
12 Other Manu	28353	0	987	28.7264	.0000
13 Transportation	45365	32787	3275	13.8519	.7227
14 Commun Utilities	15882	0	1238	12.8288	.0000
15 Wholesale Agr	6271	0	1099	5.7061	.0000
16 Other	12617	0	2009	6.2802	.0000
17 Retail Eat Drink	23083	11643	3213	7.1843	.5044
18 Gas	14596	9062	1679	8.6933	.6208
19 Farm	5830	0	1158	5.0345	.0000
20 Other	31057	2660	8681	3.5776	.0856
21 Finance Ins. Real	19104	0	2388	8.0000	.0000
22 Serv Pers Bus	31163	8433	6519	4.7803	.2706
23 Prof	51321	26118	7574	6.7759	.5089
24 Public Const	6609	0	561	11.7807	.0000
25 Utilities	3850	0	299	12.8763	.0000
26 Ot Retail	1670	362	200	8.3500	.2168
27 Health	8460	5844	932	9.0773	.6908
28 Education	51116	50680	6882	7.4275	.9915
29 Pub Adm	23800	23800	2938	8.1007	.0000
Total	1028675	490909	82586	12.4558	.4772

Table 17. Interindustry transactions of specified producing and purchase sectors, by industry (1-16), West Minnesota, 1967.

Sector	1	2	3	4	5	6	7	8	9	10
1 Agr Livestock	27318	675	0	0	5445	67910	3096	0	0	0
2 Crops	52402	6745	0	0	0	0	0	0	0	0
3 Serv For Fis	3780	7588	210	0	0	0	0	0	0	0
4 Mining Construct	687	843	60	26706	0	0	0	0	0	0
5 Manu Meat Prod	0	0	0	0	0	0	0	0	0	0
6 Dairy Prod	0	0	0	0	0	0	0	0	0	0
7 Food Feed	15119	0	0	0	0	4560	1424	0	0	0
8 Lumber Furn	0	0	15	97	0	0	0	0	0	0
9 Printing	0	0	0	0	0	0	0	0	0	0
10 Stone Clay	0	0	0	2331	0	0	0	0	0	0
11 Machinery	175	946	0	347	0	0	0	0	0	0
12 Other Manu	1481	3271	1717	2145	0	0	0	12	0	4
13 Transportation	172	843	75	680	86	485	310	30	1039	243
14 Commun Utilities	385	849	126	272	218	489	156	66	70	26
15 Wholesale Agr	425	179	69	0	5118	0	0	0	0	0
16 Other	1721	1486	181	467	0	0	298	579	6	95
17 Retail Eat Drink	0	0	0	194	0	0	0	0	0	0
18 Gas	0	1012	45	194	0	0	0	96	0	0
19 Farm	980	4650	200	0	0	0	0	0	0	0
20 Other	0	0	0	291	0	0	0	0	0	0
21 Finance Ins Real	131	1222	11	1962	49	111	378	71	77	23
22 Serv Pers Bus	687	506	75	388	0	0	0	349	0	0
23 Prof	0	0	0	583	0	194	217	44	28	26
24 Public Const	0	0	0	0	0	0	0	0	0	0
25 Utilities	150	147	39	85	0	85	27	6	6	6
26 Ot Retail	0	0	0	0	0	0	0	0	0	0
27 Health	0	0	0	0	0	0	0	0	0	0
28 Education	0	0	0	0	0	0	0	0	0	0
29 Pub Adm	0	0	0	0	0	0	0	0	0	0
Total	105614	30962	2824	36742	10917	73833	5905	1254	1225	421
Primary Inputs	66196	137669	12203	60371	32300	23181	25057	6161	5703	6138
Total Output	171810	168631	15027	97113	43217	97014	30962	7415	6928	6559

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Table 17. (Continued)

Sector	11	12	13	14	15	16	17	18	19	20
1 Agr Livestock	0	1446	0	0	0	0	138	0	0	0
2 Crops	0	0	0	0	0	0	0	0	0	0
3 Serv For Fis	0	0	0	0	0	0	0	0	0	0
4 Mining Construct	0	0	227	1413	157	151	92	15	29	311
5 Manu Meat Prod	0	0	0	0	0	0	923	0	0	0
6 Dairy Prod	0	0	0	0	0	0	646	0	0	31
7 Food Feed	0	0	0	0	0	13	669	0	0	0
8 Lumber Furn	0	0	0	0	6	13	0	0	0	0
9 Printing	0	0	140	49	77	39	0	198	86	440
10 Stone Clay	0	0	0	16	0	0	23	0	0	0
11 Machinery	0	0	93	49	0	6	0	0	0	0
12 Other Manu	114	229	440	128	68	163	0	0	9	50
13 Transportation	104	879	1588	778	151	315	0	321	414	559
14 Commun Utilities	24	175	279	1129	228	282	400	261	49	243
15 Wholesale Agr	0	0	0	22	206	0	122	21	2	66
16 Other	3	3078	145	25	116	35	555	485	322	1394
17 Retail Eat Drink	0	0	0	16	31	151	0	0	6	31
18 Gas	0	0	136	0	25	50	0	0	17	93
19 Farm	0	0	0	0	0	0	0	0	0	0
20 Other	0	0	0	16	0	50	138	15	17	93
21 Finance Ins Real	22	281	225	42	43	72	35	61	62	343
22 Serv Pers Bus	0	0	45	365	194	315	277	1474	0	342
23 Prof	15	28	227	95	119	177	508	949	152	466
24 Public Const	0	0	0	0	0	0	0	0	0	0
25 Utilities	3	50	40	347	22	33	121	51	15	81
26 Ot Retail	0	0	0	0	0	0	0	0	0	0
27 Health	0	0	0	0	0	0	0	0	0	0
28 Education	0	0	0	0	0	0	0	0	0	0
29 Pub Adm	0	0	0	0	0	0	0	0	0	0
Total	286	6166	3584	4492	1443	1868	4650	3850	1182	4543
Primary Inputs	3566	22187	41781	11390	4828	10749	18433	10746	4648	26514
Total Output	3852	28353	45365	15882	6271	12617	23083	14596	5830	31057

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Table 17. (Continued)

Sector	21	22	23	24	25	26	27	28	29
1 Agr Livestock	0	0	0	0	0	0	0	0	0
2 Crops	0	0	0	0	0	0	0	0	0
3 Serv For Fis	0	0	0	0	0	0	0	0	0
4 Mining Construct	153	280	1642	555	462	17	186	1994	928
5 Manu Meat Prod	115	31	308	0	0	0	161	0	0
6 Dairy Prod	57	0	205	0	0	2	59	204	95
7 Food Feed	134	0	51	0	0	0	8	51	24
8 Lumber Furn	19	0	51	7	0	0	8	51	24
9 Printing	176	96	221	0	24	236	0	3146	1465
10 Stone Clay	96	0	0	350	4	0	8	0	0
11 Machinery	146	286	0	10	2	0	0	0	0
12 Other Manu	268	285	194	288	37	3	36	165	77
13 Transportation	0	93	51	112	150	30	17	0	0
14 Commun Utilities	321	698	1005	22	343	13	47	1430	666
15 Wholesale Agr	7	22	0	0	8	4	0	0	0
16 Other	31	437	267	93	6	75	51	246	114
17 Retail Eat Drink	57	31	0	20	0	2	0	0	0
18 Gas	38	312	0	13	0	5	8	0	0
19 Farm	0	0	0	0	0	0	0	0	0
20 Other	19	31	257	20	4	5	34	256	119
21 Finance Ins Real	291	297	238	20	3	18	45	78	36
22 Serv Pers Bus	210	686	924	245	38	18	228	665	309
23 Prof	344	249	975	119	8	25	220	767	357
24 Public Const	0	0	0	0	0	0	0	0	0
25 Utilities	33	136	224	12	125	4	15	313	146
26 Ot Retail	0	0	0	0	0	0	0	0	0
27 Health	0	0	0	0	0	0	0	0	0
28 Education	0	0	0	0	0	0	0	0	0
29 Pub Adm	0	0	0	0	0	0	0	0	0
Total	2515	3971	6670	1886	1213	457	1134	9365	4360
Primary Inputs	16589	27192	44651	4723	2637	1213	7326	41751	19440
Total Output	19104	31163	51321	6609	3850	1670	8460	51116	23800

Table 18. Estimated value of specified purchases per \$1 of gross output, by industry (1-16), West Minnesota, 1967.

Sector	1	2	3	4	5	6	7	8	9	10
1 Agr Livestock	.159	.004	0.000	0.000	.126	.700	.100	0.000	0.000	0.000
2 Crops	.305	.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 Serv For Fis	.022	.045	.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 Mining Construct	.004	.005	.004	.275	0.000	0.000	0.000	0.000	0.000	0.000
5 Manu Meat Prod	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 Dairy Prod	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7 Food Feed	.088	0.000	0.000	0.000	0.000	.047	.046	0.000	0.000	0.000
8 Lumber Furn	0.000	0.000	.001	.001	0.000	0.000	0.000	0.000	0.000	0.000
9 Printing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10 Stone Clay	0.000	0.000	0.000	.024	0.000	0.000	0.000	0.000	0.000	0.000
11 Machinery	.001	.006	0.000	.004	0.000	0.000	0.000	0.000	0.000	0.000
12 Other Manu	.009	.019	.114	.022	0.000	0.000	0.000	.002	0.000	.001
13 Transportation	.001	.005	.005	.007	.002	.005	.010	.004	.150	.037
14 Commun Utilities	.002	.005	.008	.003	.005	.005	.005	.009	.010	.004
15 Wholesale Agr	.002	.001	.005	0.000	.118	0.000	0.000	0.000	0.000	0.000
61 Other	.010	.009	.012	.005	0.000	0.000	.010	.078	.001	.014
17 Retail Eat Drink	0.000	0.000	0.000	.002	0.000	0.000	0.000	0.000	0.000	0.000
18 Gas	0.000	.006	.003	.002	0.000	0.000	0.000	.013	0.000	0.000
19 Farm	.006	.028	.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20 Other	0.000	0.000	0.000	.003	0.000	0.000	0.000	0.000	0.000	0.000
21 Finance Ins Real	.001	.007	.001	.020	.001	.001	.012	.010	.011	.003
22 Serv Pers Bus	.004	.003	.005	.004	0.000	0.000	0.000	.047	0.000	0.000
23 Prof	0.000	0.000	0.000	.006	0.000	.002	.007	.006	.004	.004
24 Public Const	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25 Utilities	.001	.001	.003	.001	0.000	.001	.001	.001	.001	.001
26 Ot Retail	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27 Health	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28 Education	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29 Pub Adm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	.615	.184	.188	.378	.253	.761	.191	.169	.177	.064

Table 18. (continued)

Sector	11	12	13	14	15	16	17	18	19	20
1 Agr Livestock	0.000	.051	0.000	0.000	0.000	0.000	.006	0.000	0.000	0.000
2 Crops	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 Serv For Fis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 Mining Const.	0.000	0.000	.005	.089	.025	.012	.004	.001	.005	.010
5 Manu Meat Prod	0.000	0.000	0.000	0.000	0.000	0.000	.040	0.000	0.000	0.000
6 Dairy Prod	0.000	0.000	0.000	0.000	0.000	0.000	.028	0.000	0.000	.001
7 Food Feed	0.000	0.000	0.000	0.000	0.000	.001	.029	0.000	0.000	0.000
8 Lumber Furn	0.000	0.000	0.000	0.000	.001	.001	0.000	0.000	0.000	0.000
9 Printing	0.000	0.000	.003	.003	.012	.003	0.000	.014	.015	.014
10 Stone Clay	0.000	0.000	0.000	.001	0.000	0.000	.001	0.000	0.000	0.000
11 Machinery	0.000	0.000	.002	.003	0.000	.001	0.000	0.000	0.000	0.000
12 Other Manu	.030	.008	.010	.008	.011	.013	0.000	0.000	.002	.002
13 Transportation	.027	.031	.035	.049	.024	.025	0.000	.022	.071	.018
14 Commun Utilities	.006	.006	.006	.071	.036	.022	.017	.018	.008	.008
15 Wholesale Agr	0.000	0.000	0.000	.001	.033	0.000	.005	.001	0.000	.002
16 other	.001	.109	.003	.002	.018	.003	.024	.033	.055	.045
17 Retail Eat Drink	0.000	0.000	0.000	.001	.005	.012	0.000	0.000	.001	.001
18 Gas	0.000	0.000	.003	0.000	.004	.004	0.000	0.000	.003	.003
19 Farm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20 Other	0.000	0.000	0.000	.001	0.000	.004	.006	.001	.003	.003
21 Finance Ins Real	.006	.010	.005	.003	.007	.006	.002	.004	.011	.011
22 Serv Pers Bus	0.000	0.000	.001	.023	.031	.025	.012	.101	0.000	.011
23 Prof	.004	.001	.005	.006	.019	.014	.022	.065	.026	.015
24 Public Const	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25 Utilities	.001	.002	.001	.022	.003	.003	.005	.003	.003	.003
26 Ot Retail	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27 Health	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28 Education	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29 Pub Adm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	.074	.217	.079	.283	.230	.148	.201	.264	.203	.146

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Table 18. (continued)

Sector	21	22	23	24	25	26	27	28	29
1 Agr Livestock	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 Crops	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 Serv For Fis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 Mining Const.	.008	.009	.032	.084	.120	.010	.022	.039	.039
5 Manu Meat Prod	.006	.001	.006	0.000	0.000	0.000	.019	0.000	0.000
6 Dairy Prod	.003	0.000	.004	0.000	0.000	.001	.007	.004	.004
7 Food Feed	.007	0.000	.001	0.000	0.000	0.000	.001	.001	.001
8 Lumber Furn	.001	0.000	.001	.001	0.000	0.000	.001	.001	.001
9 Printing	.009	.003	.004	0.000	.006	.142	0.000	.062	.062
10 Stone Clay	.005	0.000	0.000	.053	.001	0.000	.001	0.000	0.000
11 Machinery	.008	.009	0.000	.002	.001	0.000	0.000	0.000	0.000
12 Other Manu	.014	.009	.004	.044	.010	.002	.004	.003	.003
13 Transportation	0.000	.003	.001	.017	.039	.018	.002	0.000	0.000
14 Commun Utilities	.017	.022	.020	.003	.089	.008	.006	.028	.028
15 Wholesale Agr	.000	.001	0.000	0.000	.002	.002	0.000	0.000	0.000
16 Other	.002	.014	.005	.014	.002	.045	.006	.005	.005
17 Retail Eat Drink	.003	.001	0.000	.003	0.000	.001	0.000	0.000	0.000
18 Gas	.002	.010	0.000	.002	0.000	.003	.001	0.000	0.000
19 Farm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20 Other	.001	.001	.005	.003	.001	.003	.004	.005	.005
21 Finance Ins Real	.015	.010	.006	.003	.001	.011	.005	.002	.002
22 Serv Pers Bus	.011	.022	.018	.037	.010	.011	.027	.013	.013
23 Prof	.018	.008	.019	.018	.002	.015	.026	.015	.015
24 Public Const	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25 Utilities	.002	.004	.004	.002	.032	.003	.002	.006	.006
26 Ot Retail	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27 Health	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28 Education	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29 Pub Adm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	.132	.127	.130	.285	.315	.274	.134	.183	.183

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Table 19. Estimated change in specified industry output per \$1 change in final demand, by industry (1-16), West Minnesota, 1967.

Sector	1	2	3	4	5	6	7	8	9	10
1 Agr Livestock	1.206	.007	.007	.002	.152	.850	.127	.000	.000	.000
2 Crops	.383	1.044	.002	.001	.048	.270	.040	.000	.000	.000
3 Serv For Fis	.044	.048	1.014	.000	.006	.031	.005	.000	.000	.000
4 Mining Construct	.012	.010	.009	1.382	.007	.009	.003	.005	.003	.002
5 Manu Meat Prod	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000
6 Dairy Prod	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000
7 Food Feed	.111	.001	.001	.001	.014	.128	1.060	.000	.000	.000
8 Lumber Furn	.000	.000	.001	.001	.000	.000	.000	1.000	.000	.000
9 Printing	.001	.001	.001	.001	.002	.000	.000	.001	1.000	.000
10 Stone Clay	.000	.000	.000	.033	.000	.000	.000	.000	.000	1.000
11 Machinery	.004	.006	.000	.005	.001	.003	.001	.001	.000	.000
12 Other Manu	.024	.027	.118	.032	.005	.017	.003	.004	.002	.001
13 Transportation	.008	.010	.012	.013	.007	.012	.012	.008	.156	.039
14 Commun Utilities	.008	.008	.012	.006	.012	.011	.007	.014	.012	.005
15 Wholesale Agr	.004	.001	.005	.000	.123	.003	.000	.000	.000	.000
16 Other	.021	.015	.026	.011	.005	.015	.013	.080	.002	.015
17 Retail Eat Drink	.000	.000	.000	.003	.001	.000	.000	.001	.000	.000
18 Gas	.003	.007	.003	.003	.001	.002	.000	.014	.001	.000
19 Farm	.018	.029	.014	.000	.002	.013	.002	.000	.000	.000
20 Other	.000	.000	.000	.004	.000	.000	.000	.000	.000	.000
21 Finance Ins Real	.006	.009	.003	.029	.003	.006	.014	.011	.012	.004
22 Serv Pers Bus	.008	.005	.007	.007	.005	.006	.002	.052	.001	.001
23 Prof	.002	.002	.002	.010	.003	.004	.008	.009	.005	.005
24 Public Const	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25 Utilities	.002	.022	.003	.002	.001	.003	.001	.002	.001	.001
26 Ot Retail	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27 Health	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28 Education	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29 Pub Adm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	1.865	1.231	1.241	1.548	1.399	2.384	1.299	1.202	1.198	1.074

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Table 19. (Continued)

Sector	11	12	13	14	15	16	17	18	19	20
1 Agr Livestock	.002	.062	.001	.001	.001	.002	.041	.001	.001	.001
2 Crops	.001	.020	.000	.000	.000	.001	.013	.000	.000	.000
3 Serv For Fis	.000	.002	.000	.000	.000	.000	.002	.000	.000	.000
4 Mining Construct	.002	.005	.009	.138	.044	.022	.012	.011	.012	.018
5 Manu Meat Prod	.000	.000	.000	.000	.000	.001	.040	.001	.000	.000
6 Dairy Prod	.000	.000	.000	.000	.000	.000	.028	.000	.000	.001
7 Food Feed	.000	.006	.000	.000	.000	.002	.036	.000	.000	.000
8 Lumber Furn	.000	.000	.000	.000	.001	.001	.000	.000	.000	.000
9 Printing	.000	.001	.003	.004	.013	.004	.001	.015	.016	.015
10 Stone Clay	.000	.000	.000	.004	.001	.001	.001	.000	.000	.001
11 Machinery	1.000	.000	.002	.004	.001	.001	.000	.001	.000	.000
12 Other Manu	.030	1.012	.011	.013	.014	.015	.002	.003	.004	.003
13 Transportation	.030	.037	1.038	.059	.032	.029	.004	.028	.079	.023
14 Commun Utilities	.007	.011	.008	1.081	.044	.027	.022	.025	.013	.011
15 Wholesale Agr	.000	.000	.000	.002	1.034	.000	.011	.002	.000	.002
16 Other	.004	.111	.005	.005	.022	1.006	.026	.036	.057	.046
17 Retail Eat Drink	.000	.001	.000	.001	.006	.012	1.000	.001	.002	.002
18 Gas	.000	.001	.003	.001	.005	.004	.000	1.001	.004	.003
19 Farm	.000	.001	.000	.000	.000	.000	.001	.000	1.000	.000
20 Other	.000	.001	.000	.002	.000	.004	.006	.002	.003	1.003
21 Finance Ins Real	.006	.012	.006	.007	.009	.007	.003	.007	.012	.013
22 Serv Pers Bus	.001	.004	.002	.027	.036	.028	.015	.106	.003	.014
23 Prof	.005	.003	.006	.008	.022	.016	.024	.068	.029	.017
24 Public Const	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25 Utilities	.001	.003	.001	.025	.005	.004	.006	.005	.003	.003
26 Ot Retail	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27 Health	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28 Education	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29 Pub Adm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	1.090	1.292	1.095	1.383	1.293	1.185	1.294	1.313	1.238	1.179

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Table 19. (Continued)

Sector	21	22	23	24	25	26	27	28	29
1 Agr Livestock	.006	.001	.005	.003	.001	.001	.009	.004	.004
2 Crops	.002	.000	.002	.001	.000	.000	.003	.001	.001
3 Serv For Fis	.000	.000	.000	.000	.000	.000	.000	.000	.000
4 Mining Construct	.015	.018	.049	.119	.185	.018	.034	.060	.069
5 Manu Meat Prod	.006	.001	.006	.000	.000	.000	.019	.000	.000
6 Dairy Prod	.003	.000	.004	.000	.000	.001	.007	.004	.004
7 Food Feed	.008	.000	.002	.001	.000	.000	.002	.002	.002
8 Lumber Furn	.001	.000	.001	.001	.000	.000	.001	.001	.001
9 Printing	.010	.004	.005	.001	.007	.142	.000	.062	.062
10 Stone Clay	.005	.001	.001	.056	.006	.001	.002	.002	.001
11 Machinery	.008	.010	.001	.002	.002	.000	.001	.001	.001
12 Other Manu	.016	.011	.006	.048	.016	.004	.006	.006	.006
13 Transportation	.004	.007	.004	.024	.051	.043	.004	.013	.013
14 Commun Utilities	.020	.027	.023	.007	.101	.013	.008	.033	.033
15 Wholesale Agr	.001	.001	.001	.000	.002	.002	.002	.000	.000
16 Other	.004	.016	.007	.022	.005	.046	.008	.007	.007
17 Retail Eat Drink	.003	.001	.000	.004	.001	.002	.000	.000	.000
18 Gas	.002	.010	.000	.003	.001	.004	.001	.000	.000
19 Farm	.000	.000	.000	.000	.000	.000	.000	.000	.000
20 Other	.001	.001	.003	.004	.002	.003	.004	.005	.005
21 Finance Ins Real	1.017	.011	.008	.007	.006	.014	.007	.004	.004
22 Serv Pers Bus	.013	1.025	.020	.040	.014	.014	.029	.015	.015
23 Prof	.020	.010	1.020	.021	.005	.018	.028	.017	.017
24 Public Const	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000
25 Utilities	.003	.005	.005	.003	1.036	.004	.002	.007	.007
26 Ot Retail	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
27 Health	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000
28 Education	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000
29 Pub Adm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Total	1.169	1.161	1.176	1.366	1.440	1.332	1.180	1.244	1.244

The series of three tables provides the technical coefficients and demand multipliers for assessing the industry impacts of changes in local and export markets. Because of the use made of these data in later chapters, the individual entries in the three tables are examined for two major industry groupings--agriculture and manufacturing.

Agriculture

Total output of the two agriculture sectors is, by definition, equal to total outlay, which is \$340,441,000. Of this total, 25 percent is accounted for by transactions within the two agriculture sectors. In the livestock agriculture sector, for example, \$27.3 million worth of livestock are bought and sold or otherwise transferred from one production unit to another within the livestock sector. Purchases from the crop-agriculture sector total \$52.4 million. Intra-industry transactions of the crop agriculture sector, on the other hand, are only \$6.7 million. Clearly, the purchase of grain from crop farmers by beef producers is much larger than the purchases of seed and other crop inputs by the crop agriculture sector.

Purchases of nonagricultural industry outputs are slightly larger for the crop agriculture sector than for the livestock agriculture sector. Purchase of primary inputs by the crop agriculture sector also are substantially larger than the primary input purchases by the livestock agriculture sector. Much of the allocation to primary inputs is accounted for by income payments to household.

When the distribution of gross output and gross outlay for the two agriculture sectors is transformed to a common dollar basis, internal differences in the structure of these two industries are highlighted which are important in assessing area resource development potentials. Intra-agriculture transactions for the livestock agriculture sector, for example, amount to 46.4 cents for \$1 of total outlay; for the crop agriculture sector, the same figure is only 3.7 cents. Total purchases from area industries amount to 62.1¢ per \$1 of total outlay in the livestock agriculture sector and 20.7¢ per \$1 total outlay in the crop agriculture sector. Other differences occur, also, and these differences account for the much higher demand multiplier in livestock agriculture as compared to crop agriculture--1.865 versus 1.251.

The preceding data illustrate the content of the series of three tables. With reference to estimation procedure, total industry output and outlay, and its disposition, was derived first from secondary data sources (table 17). An input profile was used, next, to derive an initial set of interindustry transactions estimates for the two agriculture sectors (table 18). Subsequently, the initial disposition of outputs and outlays for the two agriculture sectors was modified on the basis of additional data obtained from the manufacturing industry survey and other secondary sources. Thus the table of direct coefficients provides a set of estimates for the two agriculture sectors which differs from the coefficients used initially in distributing total industry outlays among producing sectors in West Minnesota.

Interindustry differences are illustrated in terms of the demand multipliers in the third of the series of three tables (table 19). For the

two agriculture sectors, substantial differences occur in the intra-agriculture multipliers. Because of large intra-industry transactions, a \$1 increase in final demand for livestock agriculture requires a \$1.206 increase in total livestock agriculture output as compared with a \$1.044 increase in crop agriculture output. The total effect on livestock agriculture output of a \$1 increase in demand for this output includes a direct effect, which is equivalent to the initial increase in sales and an indirect effect of 20.6¢ per \$1 increase in final demand. The additional indirect effect results from the intra-sector transactions which occur as a result of between-farm sales or market-to-farm sales of livestock and livestock products.

The origin of the indirect effect on industry output identified in the table of direct coefficients (see table 18). The \$1 increase in final demand for livestock agriculture, for example, results in the first round in a \$1.159 increase in total output (the additional 15.9¢ increase being represented by the direct coefficient for the livestock agriculture sector). In the subsequent rounds of production increases, an additional 4.7¢ increase in livestock agriculture output occurs to meet the additional \$1 increase in final demand. Thus, the indirect effect on output is slightly larger than the value of the direct coefficient which depicts the proportion of total industry outlay accounted for by the intra-industry purchases. Similarly, for other supplying industries, the increase in industry output associated with a \$1 increase in final demand for livestock agriculture is somewhat larger than the value of the direct coefficient for this industry. Remember, that in the first round of production increases the total livestock agriculture output of \$1.159 was required in order to meet a \$1 increase in final demand. In each round of production increases, the direct coefficient is applied to an increasingly larger total output figure until the equilibrium output level presented in table 19 is reached.

Use of the demand multiplier is restricted by two important qualifications. First, the direct coefficients upon which the demand multipliers are based represent an average of many different sizes and ages of business establishments which make up a given sector. Use of an average value for these coefficients is based on assumptions of uniform technology and import balances, and full capacity utilization of resources in a given industry. Alternatively, derivation and use of marginal coefficients (based on the additional input requirements to meet an increase in demand) would reduce the value of demand multipliers for those industries which are not operating at full capacity or which experience changes in technology and imports, and, thus, changes in the values of their direct coefficients.

Second, the average coefficient represents a short-term condition. The impact of increased output on household income and expenditures in following time periods must be handled outside the 29-sector inter-industry transaction table in the West Minnesota study. Because of the short-term approach, the demand multipliers are substantially smaller than their long-range equivalents.

In the two agriculture sectors, the long-term demand multipliers would be larger than the short-term demand multipliers, especially for the crop agriculture sector. Much of the primary inputs for this sector originate within the 14-county study area, and, hence, the sum of the direct coefficients for the sector located within this area would be increased substantially, which would result in the much larger long-term demand multipliers.

In the short-run, therefore, the \$1 increase in the final demand for livestock agriculture results in a \$1.864 increase in gross output in the area. Of this total increase, \$1.206 originates from the livestock agriculture sector, \$0.38 originates from the crop agriculture sector, and \$0.28 originates from 17 of the remaining 27 sectors. Thus, \$0.658 of the total increase in area gross output occurs because of the inter-industry linkages between livestock agriculture and other sectors in the West Minnesota economy. A similar interpretation of the findings applies to the crop agriculture sector. In the long-term perspective, however, the differential between the two demand multipliers is reduced substantially because of the inclusion of the household sector with the interacting industry sectors.

Manufacturing

A moderate degree of interdependence exists between agriculture and manufacturing. The meat, dairy, and other food products sectors receive much of the output of the livestock agriculture sector. Both sectors receive a substantial proportion of purchased inputs from the manufacturing sectors. In West Minnesota, however, the interdependence between agriculture and manufacturing is much weaker than it is for the Nation as a whole. Only \$77.8 million of the total agricultural output is sold to the manufacturing sectors (namely, sectors 5, 6, 7 and 12) and only \$21 million of agricultural inputs are purchased from manufacturing plants located in the area.

Much of the input requirements of the eight manufacturing sectors is acquired from outside the West Minnesota economy. Except for the dairy products manufacturing sector, only 25 percent or less of the total outlays of the manufacturing sectors are for goods and services produced within the 14-county study area. The outlays for locally-produced products are high for dairy processing plants because of the short haul from the farm to the plant. All other manufacturing sectors acquire a substantial proportion of the total inputs from outside the area.

Linkages between the eight manufacturing sectors and other non-agricultural sectors in West Minnesota also are substantially weaker than on a national scale. While the gross output of manufactured products exceeds \$334 million, which is 66 percent of the gross output of agricultural products, sales to the 29 sectors in the area are equivalent to only 14 percent of the total output. Purchases, however, are equivalent to 30 percent of the total output. A major part of the total manufactured output is exported to markets outside the 14-county area.

Because of the weak internal linkages between manufacturing and other producing sectors in West Minnesota, the demand multipliers for all but the dairy processing sector are small. The dairy products manufacturing multiplier is larger than for either one of the agricultural sectors. The meat products sector is the only additional sector that has a demand multiplier larger than for either one of the two agricultural sectors. Thus, for six of eight sectors the linkages with the rest of the economy are as weak or weaker than they are for the agricultural sectors.

Again, the size of the short-term demand multiplier is affected by the level of imports and the purchases of primary inputs. In the long run, too, the level of imports remains a decisive factor affecting the size of the multiplier.

Local Infrastructure

Included under the designation of local infrastructure are the four remaining commodity-producing sectors, namely, mining (which is primarily local quarrying), contract construction, transportation, communication and utilities. Except for mining, the output for each sector is roughly equal to its gross margin. Generally, these four sectors show substantially stronger linkages with the rest of the economy than is the case in agriculture and manufacturing. A major share of the outlays of these four sectors is for household services (i.e., labor inputs) and imports. Because of these outlays, the short-term demand multipliers remain small for these four sectors (as well as for a majority of the manufacturing sectors).

Trade and Services

The 9 trade and service sectors of the West Minnesota economy are closely linked to the household sector in terms of both sales and purchases. Again, the direct coefficients tend to be small with reference to the 29 producing sectors, but these coefficients are large with reference to the household sector. Thus, the short-term demand multipliers are small when compared with their long-term counterparts.

Public-Industry

The remaining six sectors of the West Minnesota economy are the local, state and federal governmental units which provide services for local residents and, also, visitors. These industries are supported partly from service charges and fees, e.g., municipal water systems, partly from local taxes, and partly from grants-in-aid, and other transfers from state and federal governments. These six sectors are examined in detail in the next chapter.

Final Demand

Final demand for area industry outputs includes sales made directly to households, governments, and private capital formation in the area, as well as sales, i.e., exports, to individuals, firms and governments outside the area. In 1967, the total final demands for the 29-sector West Minnesota economy amounted to \$695.3 million, which compares with total intermediate demands of \$333.3 million. Thus, the interindustry sales of the gross outputs was equivalent to only 32 percent of the total output (table 20).

Exports were the largest of the five final demand categories, accounting for 71 percent of the total. Household purchases accounted for 19 percent of the total, followed by capital formation with 8 percent, federal and state government purchases of 1 percent, and local government purchases of 2 percent. Included in the federal and state purchases are capital outlays for highways and other public facilities.

Table 20. Estimated purchases of specified industry outputs, by final demand sector, West Minnesota, 1967.

Sector	(Inter-Industry)	Gross Investment		Government		Households		Exports		Total	
		Investment	Fed-State	Local	Local	Exports	Imports	Exports	Imports	Demands	Output
1 Agr Livestock	106028	0	0	0	0	872	64910	65782	171810	65782	171810
2 Crops	59147	0	0	0	0	0	109484	109484	168631	109484	168631
3 Serv For Fis	11579	0	0	0	0	0	3448	3448	15027	3448	15027
4 Mining Construct	36909	38709	4990	10687	10687	3488	2331	60204	97113	60204	97113
5 Manu Meat Prod	1538	0	0	22	22	6540	35108	41679	43217	41679	43217
6 Dairy Prod	1301	0	0	0	0	3924	91789	95713	97014	95713	97014
7 Food Feed	22054	78	10	22	22	4796	4002	8908	30962	8908	30962
8 Lumber Furn	291	78	10	22	22	436	6578	7124	7415	6578	7415
9 Printing	6391	0	0	0	0	537	0	537	6928	537	6928
10 Stone Clay	2828	704	91	194	194	872	1870	3731	6559	3731	6559
11 Machinery	2059	1276	164	352	352	0	0	1793	3852	1793	3852
12 Other Manu	11186	6868	885	1896	1896	7518	0	17167	28353	17167	28353
13 Transportation	9526	0	0	0	0	3052	32787	35839	45365	35839	45365
14 Commun Utilities	10271	0	0	0	0	5611	0	5611	15882	5611	15882
15 Wholesale Agr	6271	0	0	0	0	0	0	0	6271	0	6271
16 Other	12310	94	12	26	26	175	0	307	12617	307	12617
17 Retail Eat Drink	540	0	0	0	0	10900	11643	22543	23083	22543	23083
18 Gas	2046	0	0	0	0	3488	9062	12550	14596	12550	14596
19 Farm	5830	0	0	0	0	0	0	0	5830	0	5830
20 Other	1365	0	0	0	0	27032	2660	29692	31057	29692	31057
21 Finance Ins Real	6305	0	0	0	0	12799	0	12799	19104	12799	19104
22 Serv Pers Bus	8342	0	0	0	0	14388	8433	22821	31163	22821	31163
23 Prof	6891	0	0	0	0	18312	26118	44430	51321	44430	51321
24 Public Const	0	4704	606	1299	1299	0	0	6609	6609	0	6609
25 Utilities	2325	0	0	0	0	1525	0	1525	3850	1525	3850
26 Ot Retail	0	0	0	0	0	1308	362	1670	1670	1308	1670
27 Health	0	0	0	0	0	2616	5844	8460	8460	2616	8460
28 Education	0	0	0	0	0	436	50680	51116	51116	436	51116
29 Pub Adm	0	0	0	0	0	0	23800	23800	23800	0	23800
Total	333332	52511	6769	14519	14519	130625	490909	695343	1028675	695343	1028675

Local Sales

Local sales include that part of gross output which is sold within the 14-county study area. Thus, local sales include all interindustry transactions, which are viewed as intermediate demands, and all categories of final demand, except exports and federal and state government purchases.

The livestock and crop sectors rank high among the 29 sectors in local sales to other industries. Such intermediate sales are producer or industry oriented. Local sales by construction, finance, insurance and real estate, and professional services, also, are significant. The orientation of these sectors, however, is more toward the consumer than producer, as evidenced by their high final demand components.

Export Sales

Export sales include that part of gross output which is sold to individuals, firms and governments located outside West Minnesota.* The level of export sales is only a rough indicator of the dependence of the area economy upon markets outside the area. A more accurate indicator of this dependency is the level of export-producing employment in the area. An even more accurate indicator of the importance of particular exports to an economy is the contribution to gross area products of these exports. This contribution would be equivalent to the area's share of the gross national product originating from this particular sector.

Final Payments and Value Added

Value added by the 29 industries in West Minnesota is represented, in table 21, by the final payments to households (wages, salaries, rent and interest), business (retained earnings and depreciation) and government (taxes, fees and other payments). Additional final payments are made also to each of these economic units outside the region for imports received.

The proportion that exports are of total gross outputs, when collated with value added data, yield a measure of the importance of an industry to the area economy. Thus, the data in table 16 and table 21 can be used to provide an additional indicator of the importance of each industry to the economic base of West Minnesota. Together with estimates of employment of export-producing employment, the structure of the West Minnesota economy is presented for the base year, 1967.

Income leakages from the West Minnesota economy are revealed by the estimates of import levels for each of the 29 sectors. The higher the level of imports for a given industry, the less its total impact on the area economy. Thus, the impact of a high level of export-producing employment in a given industry is reduced by a high level of imports.

* Included in the export column are grants and other government payments to public industry sectors to account for the portion of total output not covered by service charges and fees.

Table 21. Estimated sales of primary inputs to specified industry group, by primary input sector, West Minnesota, 1967.

Sector	(Inter-Industry)	Gross Saving		Government		Households		Imports	Primary Inputs	Total Output
		State	Fed	State	Local	Imports	Local			
1 Agr Livestock	105614	8762	0	1374	29036	27024	66196	171810		
2 Crops	30962	18044	0	4384	80606	34635	137669	168631		
3 Serv For Fis	2824	1367	0	135	4869	5831	12203	15027		
4 Mining Construct	36742	16121	2331	874	14276	26769	60371	97113		
5 Manu Meat Prod	10917	3501	216	130	4495	23959	32300	43217		
6 Dairy	73833	1843	97	291	6209	14744	23181	97014		
7 Food Feed	5905	2941	93	93	3870	18059	25037	30962		
8 Lumber Furn	1254	378	141	67	1794	3781	6161	7415		
9 Printing	1225	721	90	69	2792	2031	5793	6928		
10 Stone Clay	421	341	46	33	1240	4479	6138	6559		
11 Machinery	286	258	73	42	1125	2068	3566	3852		
12 Other Manu	6166	1956	28	85	6691	13426	22187	28353		
13 Transportation	3584	4718	2949	2404	16241	15469	41781	45365		
14 Commun Utilities	4492	3812	254	556	5130	1638	11390	15882		
15 Wholesale Agr	1443	1016	401	56	1881	1473	4828	6271		
16 Other	1868	795	479	63	7293	2119	10749	12617		
17 Retail Eat drink	4650	277	1293	69	9418	7376	18433	23083		
18 Gas	3850	1022	190	117	6977	2440	10746	14596		
19 Farm	1182	635	402	192	2676	742	4648	5830		
20 Other	4543	2950	1180	466	14535	7383	26514	31057		
21 Finance Ins Real	2515	745	1509	344	9762	4229	16589	19104		
22 Serv Pers Bus	3971	2181	717	654	17015	6624	27192	31163		
23 Prof	6670	2412	924	1642	31152	8521	44651	51321		
24 Public Const	1886	370	172	192	2419	1571	4723	6609		
25 Utilities	1213	654	85	208	1267	423	2637	3850		
26 Ot Retail	457	159	63	25	782	184	1213	1670		
27 Health	1134	1041	398	68	4501	1320	7326	8460		
28 Education	9365	153	51	2351	34299	4897	41751	51116		
29 Pub Adm.	4360	71	24	1095	15970	2280	19440	23800		
Total	333332	79246	14206	18081	338317	245494	695343	1028675		

Comparison of industry value added and export levels show wide differences between industries. Hence, both measures are needed to fully assess the impact of changes in these industries upon the total area economy.

Local Resource Owners

That portion of final payments from the 29 industry groups to local resource owners is included wholly within the value added definition. Local resource owners are households, businesses and governmental units located in West Minnesota, (but not including that segment of state and federal government to which income tax, personal income and other taxes are paid). The latter income payments must be separated from other income payments for a strict accounting of final payments to local resource owners.

Imports and Federal-State Government Taxes

Imports of all types of goods and services are lumped together for each of the 29 sectors in the West Minnesota input-output table. Hence, no breakdown of imports is available by industry or origin.

Payments of the 29 interacting sectors to resource owners located outside the West Minnesota area amounted to \$245.5 million in 1967. This total includes the value of imports and the payments to federal and state governments.

Water Resource Inputs and Waste Emissions

Because of the focus on water resource development in West Minnesota, water requirements of the 29 producing sectors were estimated from secondary data (42). Estimates of waste emissions from each of the production processes were prepared, also. These estimates then were translated into demand-related coefficients which show the total units of inputs or emissions associated with each \$1 increase in the final demand for a given industry output (table 22).

Water intake and waste emissions are associated with some industries, not because these industries account for intake or emission, but because input-supplying industries require water or emit wastes. Thus, an increase in demand for livestock agriculture output is associated with an increase in water intake because of the water requirements of meat products and other food and products manufacturing.

FISCAL-ECOLOGIC ACCOUNTS

Study of the present status and future potentials of the public economy of a multi-county area is facilitated by the preparation and use of a set of fiscal-ecologic accounts.* The fiscal part of the accounts refers to the public economy and its dependence upon both the economic base of the area

* For discussion of the design and use of area economic accounts, see Barnard (7) and Schreiner (63).

Table 22. Estimated water resource inputs and waste emissions associated with a \$1 increase in specified final demand by input and output unit, West Minnesota, 1967.

	Domestic		Cooling		Process		Total Wa-		5-Day		Suspended		Solid	
	Water	Water	Water	Water	Water	Water	ter Wa-	BOD	Solids	Solids	Waste	Waste	Waste	(Cu Yds)
	(Gals)	(Gals)	(Gals)	(Gals)	(Gals)	(Gals)	ter Intake	(Gals)	(Gals)	(Lbs)	(Lbs)	(Lbs)	(Cu Yds)	(Cu Yds)
1 Agr Livestock	.000005	.000006	.000166	.000176	.000166	.000166	.000166	.000166	.000166	.000000	.000000	.000000	.000076	
2 Crops	.000001	.000010	.000001	.000012	.000002	.000002	.000002	.000002	.000002	.000000	.000000	.000000	.000068	
3 Serv For Fis	.000001	.000000	.000001	.000002	.000001	.000001	.000002	.000002	.000002	.000000	.000000	.000000	.000096	
4 Mining Construct	.000125	.000008	.000002	.000061	.000002	.000053	.000053	.000053	.000053	.000000	.000000	.000000	.0001570	
5 Manu Meat Prod	.000031	.000001	.001511	.001543	.001511	.001511	.001543	.001511	.001511	.000000	.000000	.000000	.000081	
6 Dairy Prod	.000035	.000004	.001681	.001719	.001681	.001681	.001719	.001681	.001681	.000000	.000000	.000000	.000089	
7 Food Feed	.000032	.000001	.001580	.001613	.001580	.001580	.001613	.001580	.001580	.000000	.000000	.000000	.000050	
8 Lumber Furn	.000031	.000001	.000001	.000002	.000001	.000001	.000002	.000001	.000001	.000000	.000000	.000000	.000166	
9 Printing	.000122	.000001	.000000	.000001	.000000	.000001	.000001	.000001	.000001	.000000	.000000	.000000	.000075	
10 Stone Clay	.000000	.000000	.000000	.001534	.000000	.001534	.001534	.001534	.001534	.000005	.000005	.000005	.000035	
11 Machinery	.000016	.001600	.000001	.001625	.000001	.001625	.001625	.000001	.000001	.000008	.000008	.000008	.000596	
12 Other Manu	.000001	.000001	.000009	.000011	.000009	.000011	.000011	.000011	.000011	.000000	.000000	.000000	.000081	
13 Transportation	.000001	.000004	.000000	.000004	.000000	.000004	.000004	.000001	.000001	.000000	.000000	.000000	.000070	
14 Commun Utilities	.000013	.000007	.000001	.000014	.000001	.000014	.000014	.000008	.000008	.000000	.000000	.000000	.0005581	
15 Wholesale Agr	.000006	.000001	.000002	.000005	.000002	.000005	.000005	.000003	.000003	.000000	.000000	.000000	.000363	
16 Other	.000003	.000002	.000004	.000007	.000004	.000007	.000007	.000005	.000005	.000000	.000000	.000000	.000260	
17 Retail Eat Drink	.000004	.000001	.000155	.000161	.000155	.000161	.000161	.000157	.000157	.000000	.000000	.000000	.0003963	
18 Gas	.000003	.000002	.000002	.000004	.000002	.000004	.000004	.000002	.000002	.000000	.000000	.000000	.000499	
19 Farm	.000001	.000001	.000001	.000002	.000001	.000002	.000002	.000002	.000002	.000000	.000000	.000000	.000104	
20 Other	.000003	.000001	.000003	.000004	.000003	.000004	.000004	.000003	.000003	.000000	.000000	.000000	.000119	
21 Finance Ins Real	.000003	.000013	.000027	.000049	.000027	.000049	.000049	.000035	.000035	.000000	.000000	.000000	.000163	
22 Serv Pers Bus	.000002	.000015	.000002	.000019	.000002	.000019	.000019	.000003	.000003	.000000	.000000	.000000	.001722	
23 Prof	.000005	.000001	.000018	.000021	.000018	.000021	.000021	.000020	.000020	.000000	.000000	.000000	.000225	
24 Public Const	.000101	.000004	.000002	.000091	.000002	.000091	.000091	.000087	.000087	.000000	.000000	.000000	.001343	
25 Utilities	.000018	.000003	.000000	.000012	.000000	.000012	.000012	.000009	.000009	.000000	.000000	.000000	.005761	
26 Ot Retail	.000019	.000001	.000003	.000004	.000003	.000004	.000004	.000004	.000004	.000000	.000000	.000000	.0003916	
27 Health	.000004	.000001	.000043	.000047	.000001	.000043	.000047	.000046	.000046	.000000	.000000	.000000	.000134	
28 Education	.000013	.000001	.000009	.000012	.000009	.000012	.000012	.000011	.000011	.000000	.000000	.000000	.000286	
29 Pub adm	.000013	.000001	.000009	.000012	.000009	.000012	.000012	.000011	.000011	.000000	.000000	.000000	.000286	

Table 22. (Continued).

Sector	Particulates (lbs)	Hydrocarbons (lbs)	Sulfur Dioxide (lbs)	Gaseous Fluoride (lbs)	Hydrogen Sulfide (lbs)	CO ₂ (lbs)	Aldehydes (lbs)	NO ₂ (lbs)
1 Agr Livestock	-.041812	-.001849	-.003667	0.000000	0.000000	-.002089	-.000057	-.001327
2 Crops	-.030443	-.004417	-.003481	0.000000	0.000000	-.004913	-.000104	-.001288
3 Serv For Fils	-.025457	-.002366	-.005680	0.000000	0.000000	-.002616	-.000076	-.002044
4 Mining Construct	-.034054	-.002061	-.002954	0.000000	0.000000	-.002402	-.000071	-.001164
5 Manu Meat Prod	-.005782	-.000690	-.004739	0.000000	0.000000	-.000801	-.000036	-.001669
6 Dairy Prod	-.029758	-.001386	-.005226	0.000000	0.000000	-.001619	-.000060	-.001895
7 Food Feed	-.004928	-.000368	-.003296	0.000000	0.000000	-.000540	-.000041	-.001266
8 Lumber Furn	-.001372	-.009101	-.005882	0.000000	0.000000	-.000953	-.000183	-.002044
9 Printing	-.003920	-.001325	-.005183	0.000000	0.000000	-.003597	-.000391	-.003906
10 Stone Clay	-.921058	-.000385	-.002354	0.000000	0.000000	-.000947	-.000101	-.001328
11 Machinery	-.540358	-.000296	-.003256	0.000000	0.000000	-.000705	-.000079	-.001492
12 Other Manu	-.003415	-.000760	-.004947	0.000000	0.000000	-.001290	-.000105	-.002149
13 Transportation	-.023810	-.008321	-.003308	0.000000	0.000000	-.023696	-.002532	-.015623
14 Commut Utilities	-.020873	-.005066	-.413909	0.000000	0.000000	-.001804	-.000940	-.137909
15 Wholesale Agr	-.002953	-.003487	-.018379	0.000000	0.000000	-.004046	-.000165	-.006529
16 Other	-.002309	-.003186	-.011329	0.000000	0.000000	-.003756	-.000141	-.004156
17 Retail Eat Drink	-.003206	-.000415	-.010677	0.000000	0.000000	-.000386	-.000034	-.003586
18 Gas	-.035981	-.648153	-.014401	0.000000	0.000000	-.705830	-.011104	-.004170
19 Farm	-.002558	-.002834	-.005998	0.000000	0.000000	-.004132	-.000239	-.003085
20 Other	-.001517	-.002447	-.005540	0.000000	0.000000	-.002934	-.000105	-.002159
21 Finance Ins Real	-.009992	-.001571	-.008489	0.000000	0.000000	-.001675	-.000051	-.002867
22 Serv Pers Bus	-.006602	-.006895	-.012022	0.000000	0.000000	-.007471	-.000154	-.004067
23 Prof	-.002037	-.000393	-.010721	0.000000	0.000000	-.000370	-.000035	-.003610
24 Public Const	-.053595	-.002020	-.003690	0.000000	0.000000	-.002493	-.000095	-.001551
25 Utilities	-.020808	-.005104	-.425649	0.000000	0.000000	-.001603	-.000042	-.141685
26 Rt Retail	-.002017	-.002615	-.006200	0.000000	0.000000	-.003392	-.000155	-.002657
27 Health	-.002551	-.001017	-.004045	0.000000	0.000000	-.001117	-.000033	-.001392
28 Education	-.002567	-.000478	-.015079	0.000000	0.000000	-.000534	-.000063	-.003172
29 Pub Adm	-.002567	-.000478	-.015079	0.000000	0.000000	-.000534	-.000063	-.003172

and the product markets and income services in ROW. The ecologic part refers to the area's natural environment and its use as both a natural resource and for waste emissions. The set of accounts as a whole are based upon the interindustry transactions tables presented in Chapter 3.

Accounting System

The fiscal-ecologic accounts transform the product flows of area industries into corresponding income flows among the institutions involved in the total area economy. Additional sectors of the economy are introduced into the analysis at this point and additional monetary transfers are implied by the expanded system of product and income accounts.

Sector Classification

The final demand and primary input sectors in the initial input-output model of the area economy are expanded into seven household, business and governmental sectors. In addition, an ecologic sector is introduced into the accounts. Thirdly, the ROW sector represents the import and export activities in the earlier model.

Each of the sectors is differentiated further into industry, household and governmental subsectors (table 23). Altogether, a total of 99 individual subsectors are identified in the expanded model. In this presentation, however, the 99 sectors are reduced to 50 sectors by a consolidation of current household consumption and all capital accounts.

Income-receiving sectors are the row entries and income-paying sectors are the column entries in the fiscal-ecologic accounts. Not all sectors, however, receive income payments from every income-paying sector. Indeed, income transfers are indicated for only a small number of sectors. Generally, intersectoral transfers on current accounts exceed those on capital accounts.

Current accounts include all current income and expenditures. They also involve transfers from current to capital accounts (e.g., gross income allocated to depreciation reserves) and from capital to current accounts (e.g., private capital formation), but these transfers involve substantially fewer segments of the total area economy than the current-to-current accounts transfers.

Each of the 11 accounts delineated earlier represents an account class. Class 1 accounts, for example, are presented by the 23 private industry sectors of the area economy. Under the Class 1 accounts income payments are made by the 23 private industry purchasing sectors to (a) the 23 input-supplying private industry sectors, (b) the 6 input-supplying public industry sectors, (c) the 4 public finance sectors, (d) the 10 or 11 institutional sectors, (e) the ecologic sector and (f) the rest-of-world (ROW) sector. However, income payments (for services rendered) are made to only one (of 6) current public industry sectors and two (of 10) current institutional sectors in addition to the 23 private industry sectors, the ecologic sector and the ROW sector. Thus, at most, the total intersectoral transactions under the Class 1 accounts are less than 35 percent of the total potential (i.e., 23x97) accounts.

Table 23. Selected sectors in a system of fiscal-ecologic accounts for resource development planning.^{1/}

Public Industry (2/7)	Household consumption (3/8)	Public finance (4)	Institutional (5/9)
Construction ^{2/}	Food ^{6/}	Sales tax	Business
Utilities ^{3/}	Clothing ^{6/}	Property tax	Household
Retail Trade ^{4/}	Housing	Assessments	County
Health/hospitals	Household operation	Other tax	Municipal
Education/libraries	Medical care ^{6/}		Township
Public administration ^{5/}	Personal business ^{6/}		School dist.
	Transportation		Spec. dist.
	Recreation ^{6/}		State
	Private education ^{6/}		Federal
			Prop. income ^{6/}
			Net invest. ^{7/}
			Net claims ^{7/}

1/ Sector number (current/capital) for each column of sectors is indicated in parentheses.

2/ Highways, but not including transit (which would be represented as an additional subsector).

3/ Water, sewer, solid waste, electricity, gas, steam.

4/ Liquor stores.

5/ General government, public safety, welfare, recreation, natural resources and other, e.g., housing, urban renewal, and other public services provided as a public good.

6/ Included only in current account.

7/ Included only in capital account.

Transactions Matrices

If one or more sectors under a given class of accounts receives an income payment from the same or another sector, then the transaction is identified by a transactions matrix. The 11 account classes potentially yield a total 121 transactions matrices. However, only 46 transactions matrices are identified for the West Minnesota economy (table 24).

Each income-receiving sector in a transactions matrix is identified as a source of product or service which results in an income payment from the sector receiving this output. Sectors receiving income payments from private industry sectors, for example, are located in eight of the 11 classes of accounts. Private industry payments for capital goods, however, are limited to sectors in only three account classes--private industry, public finance, and ROW.

The content of transactions under each of the 11 account classes thus are differentiated as follows:

Class 1: private industry payments to (a) other private industry sectors (T1.1), (b) public industry sectors, i.e., highway construction (T2.1), (c) public finance sectors (T4.1), (d) institutional sectors, i.e., business and household income (T5.1), (e) private industry depreciation (T6.1), (f) natural resource inputs--water, land and aid (T10.1), and rest-of-world income (T11.1).

Class 2: public industry payments to (a) private industry sectors (T1.2), (b) other public industry payments, i.e., water, power and other public service enterprises, liquor stores, medical care and hospitals, and educational institutions (T2.2), (c) public finance sector, i.e., other taxes (T4.2), (d) institutional sector payments (to households), (T5.), (e) public industry depreciation (T7.1), (f) natural resource inputs (T10.2), and (g) rest-of-world (T11.2).

Class 3: current household consumptions sector payments to (a) current private industry sectors (T1.3), (b) current public industry sectors (T2.3), (c) public finance sector (T4.3), (d) current institutional sectors, i.e., property income (T4.3), (e) household consumption sector depreciation (T5.3), (f) ecologic sectors (T10.3), and (g) rest-of-world (T11.3).

Class 4: public finance sector payments (of income received from industry, households and government) to institutional sectors (T5.4).

Class 5: institutional sector payments to (a) current public sector (for public industry "sales" not covered by changes and costs (T6.2), (b) household consumption sectors (T3.5), (c) public finance sectors (T4.5), (d) institutional sectors (T5.5), and (e) institutional capital consumption (T9.6).

Class 6: private industry capital outlays for (a) capital goods from private industry (T1.6), (b) public finance sector (T4.6), and (c) rest-of-world (T11.6).

Table 24. Identification of sectors and submatrices in a system of fiscal-ecologic accounts for resource development planning.

Income-receiving sector	Input purchasing (or incoming paving)											Rest of World Total
	Current (1-5)					Industry public Capital (6-10)					Eco-logic	
	1	2	3	4	5	6	7	8	9	10		
Private industry	T1.1	T1.2	T1.3	0	0	T1.6	T1.7	T1.8	0	T1.10	T1.11	X ₁
Public industry	T2.1	T2.2	T2.3	0	T2.5	0	T2.7	0	0	T2.10	T2.11	X ₂
Household consumption	0	0	0	0	T3.5	0	0	0	0	T3.10	0	X ₃
Public finance	T4.1	T4.2	T4.3	0	T4.5	T4.6	0	T4.8	0	0	T4.11	X ₄
Institutional	T5.1	T5.2	T5.3	T5.4	T5.5	0	0	0	0	0	0	X ₅
Capital:												
Private industry	T6.1	0	0	0	0	0	0	0	0	T6.9	0	X ₆
Public industry	0	T9.2	0	0	0	0	0	0	0	T7.9	0	X ₇
Household consumption	0	0	T8.3	0	0	0	0	0	0	T8.9	0	X ₈
Institutional	0	0	0	0	T9.5	0	0	0	0	T9.9	0	X ₉
Ecologic	T10.1	T10.2	T10.3	0	0	0	0	0	0	0	0	X ₁₀
Rest of World	T11.1	T11.2	T11.3	0	0	T11.6	T11.7	T11.8	0	0	0	X ₁₁
Total	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	

Transactions (T) submatrix for each account is identified by row and column in the accounty system.

Class 7: public industry capital outlays for (a) private capital goods (T1.7), (b) public capital goods, i.e., utilities (T2.7), and (c) rest-of-world (T11.7).

Class 8: household consumption sector outlays for (a) private capital goods (T1.9), (b) public finance sector, i.e., sales tax, and (c) rest-of-world (T11.8).

Class 9: institutional sector capital outlays for (a) private industry capital depreciation (T6.9), (b) public industry capital depreciation (T7.9), (c) household consumption sector depreciation (T8.9), (d) institutional sector capital accounts (T9.9), and (e) rest-of-world accumulation accounts (T10.9).

Class 10: private emissions into natural environments from (a) current private industry output (T1.11), (b) current public industry output (T2.11), and household consumption (T3.11).

Class 11: exports of goods to buyers outside area and income payments from outside area to (a) current private industry output sectors (T1.11) and (b) current public industry output sectors (T2.11); also, income payments to public finance sectors (T4.11) and institutional sectors (T5.11).

Thus, the 11 account classes show the juxtaposition of industry, fiscal and ecologic variables in an area economy and the relationships among them. Government sectors are identified as producing and consuming sectors which have a unique relationship with industry, household and other government, and ecologic sectors.

Income Payments

Procedures for estimating each entry in the 11 classes of accounts are presented in a series of steps which parallel the preceding discussion. Because of the emphasis on public financing, only the account classes which relate specifically to the local government sectors are expanded into several sectors. The entries for each sector as discussed in terms of data sources, estimation procedures, and implications for area financing of water resource development.

Private Industry

The private industry current (Class 1) and capital (Class 6) accounts are simply an elaboration of input-output accounts presented earlier. In table 25 additional sources of public finances are identified in terms of the particular income payments of the private industry sectors to local, state, and federal government sectors. In addition, income payments to institutional sectors and to private industry capital (depreciation), ecologic and rest-of-world accounts are estimated.

Private industry income payments to governmental sectors include both charges for public goods and tax payments. Charges for water supply wastewater treatment and garbage collection of disposal are included in payments to the local utilities sector. All other private industry payments to gov-

Table 25. Estimated income payments of private industry (Class 1) sectors to specified income-receiving sectors, West Minnesota, 1967.

Income receiving sectors	Sector number	Agricultural		Agricultural services, forestry, fisheries	Construction, mining	Manufacturing			Lumber, furniture	Printing, Publishing	Stone, clay products
		Live-stock	Crops			Food products	Meat	Dairy			
		1	2	3	4	5	6	7	8	9	10
Private industry	1-23	105,464	30,815	2,785	36,657	10,917	73,748	5,878	1,248	1,219	(\$1,000) 415
Public industry	24-29	150	147	39	85	0	85	27	6	6	6
Sales tax	31	229	346	39	1,228	114	51	71	76	46	23
Property tax	32	1,353	4,358	125	713	114	234	76	64	68	31
Assessments	33	21	26	6	161	16	57	17	3	3	2
Other taxes	34	206	311	37	1,103	102	46	22	69	44	23
Business	35	3,60	-3,691	-58	14,373	3,112	-388	2,229	118	479	111
Household	36	29,036	80,606	4,869	14,276	4,495	6,209	3,870	1,794	2,792	1,240
Depreciation	45	4,467	21,078	1,878	1,748	389	2,231	712	260	242	330
ROW	50	27,024	34,635	5,813	26,769	23,959	14,741	18,059	3,781	2,031	4,479
Subtotal	30-50	66,196	137,669	12,203	60,371	32,300	23,181	25,057	6,161	5,703	6,138
Totals	1-50	171,810	168,631	15,027	97,113	43,217	97,014	30,962	7,415	6,928	6,559

^{1/} For comparison with the earlier input-output tables, sales and other taxes equal payments to federal and state governments; property tax and special assessments equal payments to local government; and business income and depreciation reserves equal gross savings.

Table 25. (Continued)

Income receiving sectors	Machinery	Other	Transportation	Communication, utilities	Wholesale trade		Retail trade			Services			
					Agricultural	Other	Eating drinking places	Gas stations	Farm machinery	Other	FIRE	Personal, Business	Professional
	11	12	13	14	15	16	17	18	19	20	21	22	23
Private industry	283	6,116	3,544	4,145	1,421	1,835	4,529	3,799	1,167	4,462	2,482	3,835	6,446
Public industry	3	50	40	347	22	33	121	51	15	81	33	136	224
Sales tax	36	15	1,557	134	215	258	1,227	101	25	621	309	376	490
Property tax	41	79	2,291	545	51	58	63	106	174	427	340	632	1,586
Assessments	1	6	113	11	5	5	6	11	18	39	4	22	56
Other taxes	37	13	1,392	120	186	221	66	89	197	559	1,200	341	434
Business	173	1,190	1,679	2,240	803	366	-508	526	437	1,894	-210	-686	-2,310
Household	1,125	6,691	16,241	5,130	1,881	7,293	9,418	6,977	2,676	14,535	9,762	17,015	31,152
Depreciation	85	766	3,039	1,572	213	429	785	496	198	1,056	955	2,867	4,722
ROW	2,068	13,426	15,469	1,638	1,473	2,119	7,376	2,440	742	7,385	4,229	6,624	8,521
Subtotal	3,566	22,187	41,781	11,390	4,828	10,749	18,433	10,746	4,648	26,516	16,589	27,192	44,651
Totals	3,852	28,353	45,365	15,882	6,271	12,617	23,083	14,596	5,830	31,059	19,104	31,163	51,321

...of amounts are included in tax payments--sales, property and income taxes, unemployment insurance and other assessments. Both sets of estimates are based on Minnesota Public Examiners reports.

Income payments to institutional sectors--business (Sector 35) and household (Sector 36) are in the form of (a) business profits which accrue to business owners as returned business earnings or dividends, (b) rent and interest, and (c) wages and salaries. These estimates are based on secondary data sources, particularly the Kansas Input-Output Study (20a). Income payments per \$1 gross output derived from these secondary sources are adjusted to percent of totals for the west Minnesota study area.

Secondary data sources also provide estimates of private industry capital outlays. No area control totals are available to adjust these estimates to some aggregate area level.

Only physical data on water intake and landfill requirements are available (22). These data are not translated into monetary values in the study. They are available, rather, to estimate the resource requirements of existing and projected levels of economic activity and population in the study area.

Net flow of world accounts are intended to show net rather than gross transfers. Private industry income payments to institutions outside the area are likely much larger than the given estimates. These estimates, also, are derived from secondary sources, except for the survey data for the manufacturing sectors.

Public Industry

Private industry current (Class 2) and capital (Class 7) accounts are derived from the secondary sources cited earlier, particularly the Kansas Input-Output Study (20a), but, including, also, Minnesota Public Examiners reports (20c). The estimates show public industry income payments to a majority of private industry sectors, one public industry sector, one public finance sector, one institutional sector, one capital accounts sector and the ROW sector (table 26). A strong linkage between public industry and the private economy is demonstrated, especially through the household sector (wage and salary payments).

Estimates of input requirements of public industry sectors are based on data used for estimating the corresponding private industry sectors. Total sector output, however, is based on the Minnesota Public Examiners reports. Also used in estimating income payments to households are reported in the 1967 employment and payroll records of local governments in the 14-county area (13a).

Household Consumption

Household consumption current (Class 3) and capital (Class 8) accounts are consolidated in this report into two aggregate accounts--current (Sector 30) and capital (Sector 47). While added differentiation of the household consumption accounts would allow for specificity in the application of tax rates and service charges to recognized categories of consumer purchases,

the data are lacking for a unique set of household expenditure estimates for the study area. The aggregate data, however, show the relative magnitude of linkages between the household consumption sector, the 23 private industry sectors, and the 6 public industry sectors (table 26).

Health and education industry purchases are indicated because of the fees and charges paid by households for hospital, university and related services from the public sector. Tax payments are shown also, but these payments are not necessarily equal to the value of services received which exceed the total fees and charges indicated earlier.

Rental and other property income payments to property owners are listed (Sector 47). These payments accrue to financial institutions as well as other business and household units (see table 25). While outlays for natural resource inputs are not included, direct imports into the household economy are included. These payments cover purchases of goods and services outside the study area.

Public Finance

The four public finance sectors are the principal current account sectors for sharing the disposition of public sector income, outside of the service charges and fees paid to the six public industry sectors (table 26). Sales tax payments, for example, accrue to state and federal governments while property taxes accrue to local and state governments.* Income from assessments also accrue primarily to local governments. Other public income transfers, mostly employment and income taxes collected in the area, accrue primarily to state and federal governments.

The table of public finance transfers is a key part of the disposition of fiscal-ecologic accounts. Public finance implications of this table were presented earlier in terms of changes in public income and expenditures over a five-year time period. The year-to-year changes are related to corresponding changes in those accounts which are linked to the public finance sectors as shown in the preceding tables.

Institutional

The 10 current institutional sectors include the several levels of government identified earlier. These sectors include also, two private institutions--business and household-- and the institution of property to which property income accrues. The 10 institutional sectors are linked to the public economy by income transfers to both the public industry sectors and the public finance sectors (table 27). They are linked also, to the aggregate accounts--household consumption (sector 30) and capital outlays (sectors 45,46,47 and 48.)

* Sales tax was not levied until 1968, but included under the category are various excise and earnings taxes which were allocated to study area from state-level data on the basis of retail sales.

Table 26. Estimated income payments of public industry (Class 2), household consumption (Class 3), and public finance (Class 4) sectors to specified income-receiving sectors, West Minnesota, 1967.

Income receiving sectors	Sector No.	Class 2					Class 3			Class 4		
		Construc- tion 24	Util- ities 25	Other retail trade 26	Health 27	Educa- tion 28	Public Adminis- tration 29	Household consump- tion 30	Sales tax 31	Proper- ty tax 32	Assess- ments 33	Other Taxes 34
Private industry	1-23	1,874	1,088	453	1,119	9,052	4,214	116,098	0	0	0	0
Public industry	24-29	12	125	4	15	313	146	6,491	0	0	0	0
Sales taxes	31	4	3	1	5	2	1	12,711	0	0	0	0
Property taxes	32	0	0	0	0	0	0	21,010	0	0	0	0
Assessments	33	19	17	4	23	127	60	492	0	0	0	0
Other taxes	34	31	25	7	40	49	23	8,316	0	0	0	0
Household	36	2,419	1,267	782	4,501	34,299	15,970	0	0	0	0	0
County	37	0	0	0	0	0	0	0	11,274	169	24	0
Municipal	38	0	0	0	0	0	0	0	3,277	1,147	2,224	0
Township	39	0	0	0	0	0	0	0	1,590	0	0	0
School district	40	0	0	0	0	0	0	0	15,898	0	1,037	0
Spec. district	41	0	0	0	0	0	0	0	0	35	1	0
State	42	0	0	0	0	0	0	0	13,676	2,502	0	6,554
Federal	43	0	0	0	0	0	0	0	7,523	0	0	5,469
Public industry	46	370	654	159	1,041	150	71	0	0	0	0	0
Household consum.	47	0	0	0	0	0	0	36,000	0	0	0	0
Institutional	48	0	0	0	0	0	0	20,000	0	0	0	0
Ecologic	49	0	0	0	0	0	0	0	0	0	0	0
ROW	50	1,881	671	260	1,718	7,121	3,315	119,329	0	0	0	0
Subtotal	30-50	4,723	2,637	1,213	7,326	41,741	19,440	217,858	21,199	34,540	1,351	15,309
Totals	1-50	6,609	3,850	1,670	8,460	51,116	23,800	340,447	21,199	34,540	1,351	15,309

1/ Income payments of the public industry (Class 2) sectors to the public finance accounts are less, per \$1 of total outlay, than corresponding industry sectors; the difference is absorbed in the ROW sector (Row 50). Capital outlays of the household (Class 3) sector are included under the capital (Class 8) sector except the allocation for depreciation (Row 47) and interest (Row 48) payments. An additional \$606,000 income payment (to public education) is included in the Sector 30 allocation for the public industry accounts (with the new total being \$6,491,000 rather than \$5,885,000 total in the earlier input-output tables).

Table 27. Estimated income payments of institutional (Class 5) sectors to specified income-receiving sectors, West Minnesota, 1967.

Income receiving sectors		Local Government									
		Business 35	Household 36	County 37	Municipal- ity 38	Township 39	School dist. 40	Special Distr. 41	State gov't. 42	Fed. gov't. 43	Prop. inc. 44
(\$1,000)											
Construction	24	0	0	3,927	1,270	1,412	0	0	0	0	0
Health	27	0	0	253	19	0	0	0	5,015	557	0
Education	28	0	0	991	238	0	38,445	0	9,247	1,143	0
Pub. adm.	29	0	0	6,411	1,150	352	0	206	4,381	11,300	0
Subtotal	24-29	0	0	11,582	2,677	1,764	38,455	206	18,643	13,000	0
Household consumption	30	0	340,447	0	0	0	0	0	0	0	0
Prop. tax	32	0	0	0	0	0	0	0	0	0	0
Household	36	10,741	0	8,462	81	91	0	0	0	21,311	10,741
County	37	0	0	0	0	0	0	0	15,776	157	0
Municipal	38	0	0	179	0	0	0	0	910	41	0
Township	39	0	0	102	0	0	0	0	160	0	0
School Dist.	40	0	0	2,424	0	0	310	0	21,208	0	0
Spec. dist.	41	0	0	11	0	0	0	0	0	19	0
State	42	549	8,780	0	0	0	0	0	0	0	0
Federal	43	8,870	66,773	0	0	0	0	0	0	0	0
Property inc.	44	2,638	0	0	0	0	0	0	0	0	0
Public ind.	46	0	0	4,870	4,318	0	11,583	55	0	0	0
Household ^{2/} consump.	47	0	20,000	0	0	0	0	0	0	0	0
Institutional	48	2,420	0	13,602	6,322	21	3,267	0	0	0	0
Subtotal	30-50	25,218	436,000	29,650	10,721	31	15,160	55	38,054	21,528	10,741
Totals		25,218	436,000	41,232	13,398	1,376	53,615	261	56,697	34,528	10,741

1/ Income payments of local government sectors to the public industry sectors cover a portion of total outlays not covered by service charges. Any remaining outlays are covered by the income payments of state and federal governments. Because of the limitations of the input-output format presented earlier, these entries were consolidated earlier in the export sector.

2/ The capital accounts of the combined institutional sector (Row 48) receive income payments savings (business, household and government).

Disposition of total income of the three major private accounts institutional--business, household and property-varies among the accounts. Business income (i.e., profit) is transferred to other sectors in the payment of employment taxes, dividends, interest and rent. On the other hand, household income is spent on property and income taxes. Finally, all property income accrues to households as personal income.

Local government income is disbursed largely to public industry sectors to cover the cost of public goods which are not covered by service fees and charges. In addition, households receive income from local governments in the form of wages and salaries.

State and federal governments also support the public industry sectors, but primarily through grants-in-aid to local governments. Only directly-supported state and federal facilities in the area are included in the public industry sector.

Capital Accounts

The capital accounts cited earlier--private industry (Class 6), public industry (Class 7), household consumption (Class 8), and institutional (Class 9) accounts--are presented in consolidated form in table 28. These accounts are expanded into sectors which correspond with those presented under four of the five current accounts. Only the public finance account is excluded.

Additional elaboration of the four capital accounts occurs in the area development accounts which are being prepared for the study area. Resource planning specialists are able to use the additional data in the preparation of a detailed five-year (or six-year) areawide capital improvements program. However, the abbreviated format present here is adequate to show the location of the capital accounts in the area accounting system and the relationship of capital accounts to current accounts in water resource development.

All capital accounts are estimated from secondary data. Much of the data in table 28 was presented in the interindustry transactions tables in Chapter 3. The additional data are an elaboration of the "Primary input" runs in the earlier tables.

Ecologic and ROW

The ecologic (Class 10) and Rest of World (Class 11) accounts complete the overall accounting system. Again, data for ecologic accounts are not available for estimation purposes except for the coefficients cited earlier. However, estimates for the ROW account are prepared from the available data sources cited earlier.

Estimates of income payments by the ROW sector are extremely difficult to prepare because of lack of both primary and secondary data for preparing the estimates directly from these data. Even data on product out-shipments from the study area are extremely limited. Only the reports of member banks in the Ninth Federal Reserve provide rudimentary bases for estimating the flow of funds to and from the institutional sectors and the ROW sector.

Table 28. Estimated income payments of private industry (Class 6), public industry (Class 7), household consumption (Class 8), and institutional (Class 9) capital sectors, and ecologic (Class 10) and rest of world (Class 11) specified income receiving sectors, West Minnesota, 1967.

Income receiving sectors	Class	Class	Class	Class	Class	Class
	6	7	8	9	10	11
	Private	Public	Household consumption	Institutional	Ecologic	Rest of World
	45	46	47	48	49	50
	(in \$1,000)					
Mining, construction	4	38,709	15,677	3,488	0	0
Food products	7	78	32	0	0	0
Lumber, furniture	8	78	32	436	0	0
Stone, clay products	10	704	285	872	0	0
Machinery	11	1,276	516	0	0	0
Other manufacturing	12	6,868	2,781	3,759	0	0
Other wholesale	16	94	38	87	0	0
Other	1-23	0	0	0	0	0
Other retail	26	0	0	0	0	0
Subtotal	1-29	47,807	19,361	8,642	0	0
Sales taxes	31	382	0	327	0	0
Business	35	0	0	0	0	0
Household	36	0	0	0	46,257	0
County	37	0	0	0	13,832	0
Municipal	38	0	0	0	5,620	0
Township	39	0	0	0	24	0
School district	40	0	0	0	12,738	0
Special District	41	0	0	0	195	0
State	42	0	0	0	0	24,636
Federal	43	0	0	0	0	54,101
Property income	44	0	0	0	8,193	0
Private industry	45	0	0	0	5,428	0
Public industry	46	0	0	0	25,068	0
Household consumption	47	0	0	0	5,398	0
Institutional	48	0	0	0	0	36,795
ROW	50	7,657	13,935	27,031	0	0
Subtotal	30-50	8,039	13,935	27,358	117,265	0
Totals	1-50	55,846	33,296	36,000	117,265	0

1/ Income payments of the capital sectors cover the final demands of the business, household and government sectors identified earlier in the input-output tables. Private industry (Sector 45) payments are identical to gross investment and public industry (Sector 46) payments are identical to government purchases. Household consumption (Sector 47) payments are less than household purchases in the input-output tables (since the household sector is exogenous to the 29 industry sectors). However, together with the current household consumption (sector 30) income payments, the two sets of payments for household consumption equal the value of household purchases under final demand.

PUBLIC ECONOMY

The fiscal-ecologic accounts include elements of the local public economy in the public industry, public finance, and institutional sectors. These sectors account for the income and expenditures of the 14 counties, 119 municipalities, 343 townships, 241 school districts, and 22 special districts -- a total of 739 individual governmental units -- which make up the West Minnesota public economy.

The public economy is identified, first, in terms of its revenue sources. These sources relate directly to the area industry structure which account for the tax base of local governments in the area and other local governmental receipts, exclusive of transfers from the state and the federal government.

The public economy also is identified in terms of its current and capital expenditures. The levels of these expenditures are related to both industry structure and urbanization in the area. The size and number of municipalities, and their rates of growth, are the principal factors for per capita and total expenditure levels of local governments.

Local Government Revenue

Local government revenue is acquired from five major sources -- current local sources, transfers, borrowing, nonurban sources, and net funds withdrawal (table 29). The first three are of major interest in this study.*

Counties account for 37 percent of all local government inflow of funds; municipalities account for 24 percent and townships approximately 4 percent (table 30). Townships serve a much smaller population than municipalities; townships remain a minor environmental unit financially.

Cross classification of revenue sources and types of local government show that townships are most dependent and school districts and counties least dependent on their own sources. Conversely, counties and school districts are most dependent on transfers from state and federal governments.**

* The five funding sources are defined as follows: current local sources comprise taxes, special assessments, charges, permits, interests, fines, which together account for about one third of all revenues; transfers include state share taxes, grants for special and general purposes from the state and federal governments, plus minor transfers of funds among local governments and from individuals as gifts, which supply a slightly larger portion of revenue than do current local sources; borrowing is a component, comprising less than 10 percent of all local inflow of funds; nonrevenue sources include refunds, trust and agency receipts, and sale of investments; and net funds withdrawal refers to a balancing item to equate inflows and outflows for each governmental unit each year.

** The same cross-classification by revenue source and type of government is shown in the overall fiscal-ecologic accounts in table 32.

Table 29. Inflow of funds for local governments, by class of funds, West Minnesota, 1967.

Class of inflow	Total	Per capita*	Proportion of total
	Dollars	Dollars	Percent
Current local sources	40,333,956	168	36.6
Transfers	41,306,055	172	37.4
Borrowing †	8,761,564	36	7.9
Net nonrevenue	13,720,187	57	12.4
Net funds withdrawal	6,260,462	26	5.7
Total	110,382,224	459	100.0

*Assumed 1967 population of 240,732.

Table 30. Local government revenues, by type of local government, West Minnesota, 1967.^{1/}

Source	County	Municipal	Town-Ship	School District		Special District	Total
				District	District		
Thousands of dollars							
Current local	11,443	4,423	1,590	15,898	35	35	33,389
Taxes	548	1,641	0	1,337	132	132	3,658
Charges	24	2,224	0	1,037	1	1	3,286
Other							
Subtotal	12,015	8,288	1,590	18,272	168	168	40,334
Transfers							
Federal	157	41	0	0	19	19	217
State	15,776	910	160	21,208	0	0	38,054
County	0	179	102	2,424	11	11	3,716
School district	0	0	0	310	0	0	310
Other	0	9	0	0	0	0	9
Subtotal	15,933	1,140	262	23,942	30	30	41,306
Borrowing	640	2,470	20	5,598	33	33	8,762
Net nonrevenue	12,644	530	0	546	0	0	13,720
Net fund withdrawal	0	970	3	5,257	30	30	6,260
Subtotal	13,284	3,970	23	11,401	63	63	23,742
Total	41,232	13,398	1,875	53,615	261	261	110,382

^{1/} Sum of column rows may not equal area totals because of rounding.

In 1967, the property tax was the dominant type of local direct revenue in the study area. Fees and charges represent only a small percentage of the total. However, for special districts, most of which have no direct taxing authority, charges are the major source of local direct revenue. Municipalities, too, rely on charges to an important degree, but the data underestimate the degree of reliance since public service enterprises, such as utilities, nursing homes, hospitals and liquor stores, are treated separately. Only the net transfers between public service enterprise and municipalities are recorded. Charges actually are a significant portion of the revenue of special districts and municipalities. Each of these funding sources were related earlier to the industry, household and institutional accounts (in tables 25, 26, 27, and 29.)

Altogether, 11 different sources for funds are included under the five major classes listed earlier. The additional detail included falls under current local sources, namely, property taxes, charges and fees, and other local sources; transfers include federal, state, county, school district, and other. Additional detail for borrowing, net revenue inflow, and net fund withdrawals is not presented.

Of the eleven sources, two are endogenous to the West Minnesota public economy--transfers from counties and transfers from school districts. These two items are both inflows and outflows for the local public economy. The remaining nine sources include one other source and eight that are distinctly exogenous to the study area.

The two key sources of funds for local government then are its own local sources, including taxation, charges and other inflows; and state government transfers. Although the federal government contributes a larger share than shown in table 30, the nonlisted transfers are channeled through state government. Hence, it is useful to look at a combination of state and federal transfers that might be called exogenous government transfers. The remaining three exogenous sources are of interest in short run situations. In the long run, borrowing, net nonrevenue inflows, and net cash withdrawals would be balanced by debt retirements, net non-revenue outflows, and net cash accruals.

Recent shifts in current revenue sources are identified for the 119 municipalities and 14 counties (table 31). Adoption of a state sales tax in 1967 provided for the higher levels of transfer payments to both municipalities and counties. Concurrently, local property taxes were reduced. By 1971, however, local property taxes revenues had reached pre-1967 levels.

Changes in the local tax base paralleled changes in local tax sources (table 32). Again, the property tax relief cited earlier is identified in terms of reduced taxable valuation of both the municipal and the county tax base. The taxable valuation is roughly one-tenth the total market value of all taxable real estate and personal property in the 14-county area.

Table 31. Current municipal and county revenues from specified services, West Minnesota, 1960-1961.^{1/}

Source of funds	1967	1968	1969	1970	1971
Municipal:					
Property taxes	3,304	4,101	3,204	3,762	4,063
Special assessments	1,156	1,092	1,062	1,286	1,458
Licenses, permits	267	294	302	318	300
Fines, forfeits	134	173	234	836	293
Grants, transfers	1,145	1,204	3,382	2,973	3,721
Fees, charges	1,256	1,327	1,465	1,542	1,745
Public service enterp.	2,318	2,151	2,305	2,412	2,380
Other	292	333	599	452	485
Total	9,883	10,673	12,533	12,980	14,445
County:					
Property taxes	11,274	11,458	8,300	10,266	11,164
Special assessments	169	174	150	220	212
Licenses, permits	27	38	37	30	47
Fines, forfeits	105	119	143	147	184
Grants, transfers	15,933	15,837	19,585	20,519	23,171
Fees, charges	250	429	435	700	696
Other	193	294	354	674	725
Total	28,147	28,349	29,005	32,557	36,199

^{1/} Revised estimates; totals for 1967 will differ from corresponding totals in preceding totals because of the inclusion of additional minor revenue sources.

Table 32. Total taxable valuation of real estate and property in municipalities and outside municipalities, West Minnesota 1966-1970.

Taxable valuation	1967	1968	1969	1970	1971
	(\$1,000)				
Municipal	56,653	57,801	52,976	55,298	57,340
Other	84,869	89,451	76,376	82,862	84,164
Total	141,522	147,252	129,352	138,160	141,504

Local Government Expenditures

Current and capital expenditures of local governments (in table 33), are listed under six major functional groups (table 34). The dominant local government function is education, which uses almost 60 percent of all local government current and capital expenditures. Welfare and roads are all secondary activities, each requiring over 10 percent of all current and capital expenditures. In West Minnesota, health, sanitation and police and fire protection are minor expenditure items. Again, each of the expenditure items shown also, in the account tables cited earlier.

Local governments differ in levels of current and capital expenditures (table 35). A major share of municipal government outlays are for capital improvements.

Functional classification of expenditures by type of local government illustrates a degree of government specialization (table 36). Welfare and roads are the major county functions. Municipalities incur major expenditures in health and sanitation, with sanitation the major component. Township are concerned primarily with roads.

Average per capita current expenditures in the east and west counties is approximately \$290 per resident. The average masks substantial inter-county differences; however, the three largest counties in population are the only ones with per capita expenditures of less than \$260 per person. All other counties have per capita expenditures above the average, which supports the contention that per capita expenditures for the same service are higher in small counties than large counties.

Local governments in seven west counties spend more per resident for general government, public safety, sanitation, libraries, recreation, roads and natural resources than seven east counties; while the east counties spend more for health, hospitals and welfare.

Higher welfare expenditures in the east than in the west counties are due to lower per capita income. Higher expenditures for libraries, public safety, and sanitation in the west counties, however, are reflection of above-average expenditures in the largest county.

Capital expenditures were 32 percent of total outflow of funds for municipalities and debt retirement accounted for an additional 11 percent of the total expenditures (even though interest paid by local government on debt is included in the current expenditure category).

No capital expenditures are shown for townships. Since the data available group both capital and current expenditures in four counties, the entire amount was included as current expenditures.

Expenditure for school districts show expenditures only for the education functions: all administrative and other expenditures are attributed to the education function. Similarly, for special districts, expenditures are shown for natural resources and housing, which are included with the other function.

Table 33. Public expenditures, by expenditures, by expenditure category, West Minnesota, 1967.

Expenditure category	Total	Per capita	Proportion of total
. . . . DOLLARS PERCENT . . .	
Current	69,728,000	290	63
Capital	20,777,000	86	19
Debt retirement	3,518,000	15	3
Net nonrevenue	309,000	1	0
Net funds accrual	16,050,000	67	15
Total	110,382,000	459	100

Table 34. Public expenditures, by function, West Minnesota, 1967.

Function	Total	Per capita	Proportion of total
. . . . Dollars percent . . .	
General gov't and other	6,951,000	29	8
Safety (police, fire)	2,119,000	9	2
Health and sanitation	2,824,000	12	3
Education, libraries	51,267,000	213	58
Welfare	11,491,000	48	13
Roads, natural resources	13,437,000	56	15
Total	88,089,000*	367	100

*The sum of expenditures by function does not equal the sum of current and capital expenditures in another table due to double counting of county transfers to local government.

Table 35. Expenditures of specified type of local government by function, West Minnesota, 1967.

Type of local government	Current	Capital	Debt retirement	Net non-revenue	Net fund accrual	Total
. . . . thousands of dollars						
County	22,760	4,870	345	75	13,181	41,232
Municipal	6,452	4,318	1,436	52	1,141	13,398
Township	1,855	0	31	0	0	1,876
School district	38,455	11,583	1,696	182	1,699	53,615
Special district	206	6	20	0	30	261
Total	69,728	20,777	3,518	309	16,050	110,382

Table 36. Total current and capital expenditures (net of local transfers) for specified functions, by type of local government, West Minnesota, 1967*

Type of local government	General Gov't.	Safety	Sanitation	Health	Education	Welfare
. . . . thousands of dollars						
Current						
County	2,191	502	0	253	939	11,318
Municipal	875	1,452	767	19	0	81
Township	266	20	0	0	0	91
School District	0	0	0	0	38,455	0
Special district	0	0	0	0	9	0
Total	3,332	1,974	767	273	39,394	11,491
Capital						
County	74	0	0	0	0	0
Municipal	260	145	1,785	0	0	0
School District	0	0	0	0	11,583	0
Special District	0	0	0	0	0	0
Total	334	145	1,785	0	11,583	0
Total all expenditures	3,666	2,119	2,552	273	50,977	11,491
Type of local government	Libraries	Recreation	Roads	Natural resources	Other	Total
. . . . thousands of dollars						
County	52	7	3,927	414	441	20,044
Municipal	238	438	1,270	0	1,616	6,758
Township	0	0	1,412	0	66	1,855
School district	0	0	0	0	0	38,455
Special district	0	0	0	164	42	206
Total	290	446	6,609	577	2,166	67,318
County	0	0	4,424	0	343	4,870
Municipal	0	222	1,160	0	745	4,318
School district	0	0	0	0	0	11,583
Special district	0	0	0	4	1	6
Total	0	222	5,584	4	1,119	20,777
Total all expenditures	290	668	12,193	581	3,285	88,095

*Sum of county totals may not equal area totals because of rounding.

Capital expenditures by type of government and function generally are comparable with current expenditure patterns. Almost 90 percent of all county capital expenditures are for roads. Over 50 percent of the total municipal capital expenditures are for sanitation and about 25 percent for roads. The total school district capital expenditure of \$48 per resident is for education. Education, roads and sanitation are the major capital expenditures category for local government in West Minnesota.

Year-to-year shifts in expenditures also are summarized for the 119 municipalities and 14 counties for the 1967-1971 period (table 37). These data show substantial expenditure increases (apart from public education) for public safety, welfare and roads and streets.

Shifts in capital outlays of municipal and local governments differ from shifts in current outlay (table 38). Capital outlays for wastewater treatment facilities and garbage dumps are relatively larger than in the case of current outlays while capital outlays for public safety and welfare are much smaller.*

Flow of Funds

The data on local government revenues and expenditures are summarized in a series of "flow of funds" tables which show year-to-year changes in both current and capital income accounts (table 39). Municipal service enterprises (i.e., water, electric, heat and gas utility systems, hospitals, nursing homes, and liquor stores) are identified in terms of five income sources and seven expenditure purposes. These municipal systems are included among the public industry sectors presented earlier.

The accounts for a particular category of municipal enterprises, namely, water utility systems, further illustrate the compilation of statistical series, by municipality (table 40). Here, total inflow equals total outflow for each municipal enterprise because of the use of an accounting entry, i.e., net funds withdrawal or net funds accrual. Aggregation of municipal data results in entries under both the withdrawal and the accrual categories. Actual transfer of funds in or out of the municipal enterprise account is represented by the two transfer columns.

Flow of funds between public and private accounts in the total fiscal-ecologic accounting system is recapitulated finally, in a series of consolidated tables. First, the interaction of the public finance (class 4) accounts with all other current accounts is summarized in a 50 x 5 matrix (table 41). Income payments of the private sectors to the four public resource sectors (i.e., 31, 32, 33 and 34) and the four public finance sectors to the seven public institutional sectors (i.e., 37, 38, 39, 40, 41, 42 and 43) are shown in this table.

Second, the interaction of the public finance sectors with the capital accounts is identified in another 50 x 5 matrix (table 42). This interaction is extremely limited, however, being confined to only the collection of sales taxes from private industry and household consumption sectors. The extent of public borrowing and retirement of public indebtedness also is represented

* Total revenues and expenditures of public service enterprises are not included in the preceding tables; only transfers to the general municipal accounts are shown.

Table 37. Total current municipal and county government expenditures for specified purposes, West Minnesota, 1967-1971.^{1/}

Purpose	1967	1968	1969	1970	1971
	(\$1,000)				
Municipal:					
General government	889	909	1,013	1,152	1,405
Public safety	1,463	1,518	1,846	2,047	2,184
Sanitation	782	1,102	1,242	1,373	101
Health and charities	101	56	70	56	75
Libraries	239	123	138	143	163
Recreation	454	498	594	624	739
Streets	1,295	1,447	1,551	1,934	1,875
Public service enterprise	575	649	385	567	593
Interest Other	605	684	790	841	1,071
Other	485	474	605	782	715
Total	6,885	7,365	8,094	9,438	9,977
County:					
General government	2,191	2,266	2,449	2,603	2,928
Public safety	391	476	739	903	946
Health and hospitals	253	271	372		538
Education	3,363	2,430	2,241	2,322	1,530
Welfare	11,413	11,889	13,012	13,884	16,517
Libraries	37	55	58	66	67
Recreation	7	22	36	19	26
Natural resources	424	509	524	508	628
Roads	4,069	4,280	4,480	5,728	5,443
Interest	53	79	61	154	187
Other	433	497	666	955	739
Total	22,760	22,908	24,635	27,639	29,500

^{1/} Revised estimates

Table 38. Total municipal and county government capital expenditures for specified purposes, West Minnesota, 1966-1970.

Purpose	1967	1968	1969	1970	1971
	(\$1,000)				
Municipal:					
General government	261	160	68	39	52
Public safety	140	130	292	574	696
Sanitation	1,769	2,402	1,779	2,473	2,201
Recreation	223	126	225	237	410
Streets	1,147	2,029	2,248	1,678	1,404
Other	743	334	397	613	1,058
Total	4,283	4,719	5,007	5,675	5,823
County:					
General governments	91	130	402	392	542
Roads	4,871	4,586	4,387	6,069	6,499
Other	376	118	141	92	200
Total	4,871	4,834	4,930	6,553	7,241

Table 39. Flow of funds for all municipal service enterprises, West Minnesota, 1967-1972.^{1/}

Item	1967	1968	1969	1970	1971	1972
	(\$1,000)					
Inflow of funds:						
Operating revenue	15,576	16,671	18,861	20,426	22,369	23,633
Nonoperating revenue	296	322	320	222	362	350
Borrowing	630	1,150	754	974	162	691
Transfer	354	435	297	426	509	523
Net fund withdrawal	2,923	1,997	2,940	6,169	2,157	1,688
Total inflow	19,780	20,576	23,171	28,218	25,560	26,886
Outflow of funds:						
Operating expenses	12,579	13,252	15,097	16,523	18,445	19,690
Nonoperating expenses	309	316	378	351	417	461
Capital outlays	2,882	3,391	3,024	6,695	2,505	1,815
Interest payments	313	305	343	335	401	405
Debt retirement	663	477	603	573	563	646
Transfer	2,256	2,025	2,261	2,316	2,245	2,489
Net fund accrual	976	810	1,465	1,425	985	1,376
Total outflow	19,780	20,576	23,171	28,218	25,560	26,886

^{1/} Calendar year basis.

Table 40. Flow of funds for municipal water utility systems, West Minnesota, 1967-1972.^{1/}

Item	1967	1968	1969	1970	1971	1972
(\$1,000)						
Inflow of funds:						
Operating revenue	1,409	1,335	1,457	1,553	1,803	1,786
Nonoperating revenue	33	19	64	49	37	55
Borrowing ^{2/}	235	90	254	47	10	601
Transfer	168	248	178	291	270	429
Net funds withdrawal	714	416	673	906	415	427
Total inflow	2,559	2,108	2,625	2,847	2,535	3,298
Outflow of funds:						
Operating expense	1,166	1,045	1,263	1,371	1,544	1,558
Nonoperating expense	89	102	108	107	111	158
Capital outlays	812	432	716	901	328	669
Interest payments	93	96	106	107	118	122
Debt retirement	188	182	193	177	208	199
Transfer	113	83	157	104	112	50
Net fund accrual	98	168	83	80	114	542
Total outflow	2,559	2,108	2,625	2,847	2,535	3,298

^{1/} Calendar year basis

^{2/} Number of municipalities reporting issuance of bonds is as follows (consecutively, by year): 2,3,5,3,2, and 4; a total of 17 municipalities (exclusive of duplication, by year) reported income from the sale of bonds during the 6 year period.

Table 41. Income receipts from specified sectors, by current account class, West Minnesota, 1967.

Sector	Sector No.	Class 1	Class 2	Class 3	Class 4	Class 5
(\$1,000)						
Agr. livestock	1	106028	0	872	0	0
Agr. crops	22	59147	0	0	0	0
Ag. Serv. for.	3	11579	0	0	0	0
Mining Constr.	4	32767	4142	0	0	0
Meat prod. mfg.	5	1377	161	6540	0	0
Dairy Prod.	6	941	360	3924	0	0
Other food prod.	7	21971	83	4796	0	0
Lumber, furn.	8	201	90	0	0	0
Printing, pub.	9	1520	4870	537	0	0
Stone, clay	10	2466	362	0	0	0
Machinery	11	2047	12	0	0	0
Other manufacturing	12	10580	606	3759	0	0
Transportation	13	9217	309	3052	0	0
Comm., utilities	14	7750	2521	5611	0	0
Wholesale agr.	15	6259	12	0	0	0
Other wholesale	16	11725	585	88	0	0
Eat, Drink places	17	518	22	10900	0	0
Gas stations	18	2020	26	3488	0	0
Farm equipment	19	5830	0	0	0	0
Other retail	20	927	439	27032	0	0
FIRE	21	6105	200	12799	0	0
Per., bus. services	22	6839	1503	14388	0	0
Prof. services	23	5395	1496	18312	0	0
Public construction	24	0	0	0	0	6609
Utilities	25	1710	615	1525	0	0
Other retail	26	0	0	1308	0	0
Health	27	0	0	2616	0	5844
Education	28	0	0	1042	0	50074
Administration	29	0	0	0	0	23800
Household const.	30	0	0	0	0	340447
Sales taxes	31	7763	16	12711	0	0
Property taxes	32	13532	0	21010	0	0
Assessments	33	609	250	492	0	0
Other taxes	34	6818	175	8316	0	0
Business	35	25218	0	0	0	0
Household	36	279079	59238	0	0	51427
County	37	0	0	0	11467	15933
Municipal	38	0	0	0	6648	1130
Township	39	0	0	0	1590	262
School dist.	40	0	0	0	16935	23942
Special dist.	41	0	0	0	36	30
State	42	0	0	0	22732	9329
Federal	43	0	0	0	12992	75643
Property inc.	44	0	0	0	0	2638
Private industry	45	50418	0	0	0	0
Public industry	46	0	8228	0	0	0
Household cons.	47	0	5397	36000	0	0
Institutional	48	0	0	20000	0	66458
Ecologic	49	0	0	0	0	0
ROW	50	234815	14581	119329	0	0
Totals	1-50	933170	95505	340447	72400	673566

Table 42. Income receipts from specified sectors, by capital account class,
West Minnesota, 1967.

Sector	Sector No.	Class 6	Class 7	Class 8	Class 9	Class 11	Totals
Agr. Livestock	1	0	0	0	0	64,910	171,810
Agr. crops	2	0	0	0	0	109,484	168,631
Ag. serv. for.	3	0	0	0	0	3,448	15,027
Mining constr.	4	38,709	15,677	3,488	0	2,331	97,114
Meat prod. mfg.	5	0	0	0	0	35,139	43,217
Dairy prod.	6	0	0	0	0	91,789	97,014
Other food prod.	7	78	32	0	0	4,002	30,962
Lumber, furn.	8	78	32	436	0	6,578	7,415
Printing, pub.	9	0	0	0	0	0	6,928
Stone, clay	10	704	285	872	0	1,870	6,559
Machinery	11	1,276	516	0	0	0	3,851
Other mfg.	12	6,868	2,781	3,759	0	0	28,353
Transport	13	0	0	0	0	32,787	45,365
Comm., util.	14	0	0	0	0	0	15,882
Wholesale agr.	15	0	0	0	0	0	6,271
Other wholesale	16	94	38	87	0	0	12,617
Eat, drink, Pl.	17	0	0	0	0	11,643	23,083
Gas stations	18	0	0	0	0	9,062	14,596
Farm equip.	19	0	0	0	0	0	5,830
Other retail	20	0	0	0	0	2,660	31,057
FIRE	21	0	0	0	0	0	19,104
Per., bus. serv.	22	0	0	0	0	8,433	31,163
Prof. serv.	23	0	0	0	0	26,118	51,321
Public constr.	24	0	0	0	0	0	6,609
Utilities	25	0	0	0	0	0	3,850
Other retail	26	0	0	0	0	362	1,670
Health	27	0	0	0	0	0	8,660
Education	28	0	0	0	0	0	51,116
Administration	29	0	0	0	0	0	23,800
Household cons.	30	0	0	0	0	0	340,447
Sales taxes	31	382	0	327	0	0	21,199
Prop. taxes	32	0	0	0	0	0	34,541
Assessments	33	0	0	0	0	0	1,351
Other taxes	34	0	0	0	0	0	15,309
Business	35	0	0	0	0	0	25,218
Household	36	0	0	0	46,257	0	436,000
County	37	0	0	0	13,832	0	41,232
Municipal	38	0	0	0	5,620	0	13,398
Township	39	0	0	0	24	0	1,876
School dist.	40	0	0	0	12,738	0	53,615
Special dist.	41	0	0	0	195	0	216
State	42	0	0	0	0	24,635	56,697
Federal	43	0	0	0	0	-54,107	34,528
Property inc.	44	0	0	0	8,103	0	10,741
Private industry	45	0	0	0	5,428	0	55,846
Public industry	46	0	0	0	0	0	33,296
Household cons.	47	0	0	0	0	0	36,000
Institutional	48	0	0	0	0	36,205	117,265
Ecologic	49	0	0	0	0	0	0
ROW	50	7,657	13,935	27,031	0	0	417,348
Totals		55,846	33,296	36,000	117,265	417,348	2,774,843

by the institutional (Class 9) capital accounts.

Third, the consolidated flow of funds statement for the total area economy is represented by an 11 x 11 matrix (table 43). This table summarizes the total income payments within the area economy and between this economy and the rest of world.

DEVELOPMENT FINANCING

Use of the fiscal-ecologic accounts in local government financial planning is demonstrated in forms of projected economic activity in the 14-county study area. Economic growth trends for the 1967-1980 period are summarized, first, for the set of interindustry transactions identified earlier (see tables 18 to 23). The industry summaries are translated into projected public outlays and financing sources to cover these outlays. Finally, a set development accounts for local fiscal planning is presented with particular reference to proposed water resource development projects and programs in the multi-county planning area.

Economic Growth

Projected area economic growth is a function of projected national and regional growth. Indeed, the regional projection series prepared by the U.S. Office of Business Economics for the Water Resources Council provide the overall data constraints on the area projected series (78). A shift-share model was used subsequently in allocating the regional totals to individual counties and the county series were regrouped, finally, to obtain the area projection series (6, 17, 29, 36, 38).

Employment and Productivity

Given the U.S. Office of Business Economics (OBE) projections series for the Fargo-Moorhead, Grand Forks, and Minneapolis-St. Paul Economic Areas, the subarea allocation procedure which was applied to these data yielded a net increase of nearly 9,000 in total employment for the 14-county study area during the 10-year period from 1970 to 1980 (table 44). Most of the projected employment increase is attributed to three sectors -- public utilities, professional services and public administration. These sectors generally show above-average growth and this growth is not cancelled by a negative area shift effect.

Because the areawide decline in agricultural employment is much less in the 1970-80 period than in earlier periods, the depressive local effects of this decline are reduced in terms of residential (i.e., nonbasic, non-export-producing) employment. Thus, the general effects of national growth and above-average industry growth are cancelled less often in the projected series than in the earlier reported series. In summary, therefore, the 14-county area is likely to experience more rapid employment and population growth than in the 1950-60 and 1960-70 periods and the probable environmental impacts of these increases are likely to increase rather than decrease in the 1970-70 period.

Table 43. Summary of income receipts from specified sources, by account class, West Minnesota, 1967.

Income-	Current accounts					Total	
	Industry		Household cons.	Public finance	Institu- tional		
	Private 1	Public 2					
						(\$1,000)	
Current accounts:							
Private industry	1	313,210	17,900	116,098	0	0	447,108
Public industry	2	1,710	615	6,491	0	86,327	95,143
Household consumption	3	0	0	0	0	340,447	340,447
Public finance	4	28,721	441	42,529	0	0	71,691
Institutional	5	304,297	59,238	0	72,400	180,334	616,269
Total	1-5	647,930	78,094	165,118	72,400	607,108	1,570,657
Capital accounts:							
Private industry	6	50,418	0	0	0	0	50,418
Public industry	7	0	8,228	0	0	0	8,228
Household consumption	8	0	5,397	36,000	0	0	30,602
Institutional	9	0	0	20,000	0	66,458	115,098
Ecologic	10	0	0	0	0	0	0
Rest of world	11	234,81	14,561	119,329	0	0	368,728
Total	6-11	285,23	17,411	175,329	0	66,458	576,100
All accounts	1-11	93,17	95,505	340,440	72,400	673,566	2,146,757

Table 43. (Continued)

Income-	Capital accounts						Total	All accounts	
	Industry		Household cons.	Institu- tional	Ecologic	Rest of World			
	Private 6	Public 7							
Current accounts:									
Private industry	1	47,807	19,361	8,642	0	0	410,252	486,062	933,170
Public industry	2	0	0	0	0	0	362	362	95,505
Household consumption	3	0	0	0	0	0	0	0	340,447
Public finance	4	382	0	327	0	0	0	709	72,400
Institutional	5	0	0	0	86,769	0	-29,471	57,298	673,565
Total	1-5	48,189	19,361	8,969	86,769	0	381,143	544,431	2,115,088
Capital accounts:									
Private industry	6	0	0	0	5,428	0	0	5,428	55,846
Public industry	7	0	0	0	25,068	0	0	25,068	33,296
Household consumption	8	0	0	0	0	0	0	0	36,000
Institutional	9	0	0	0	0	0	36,205	36,205	117,265
Ecologic	10	0	0	0	0	0	0	0	0
Rest of world	11	7,657	13,935	27,031	0	0	0	0	417,348
Total	6-11	7,657	13,935	27,031	30,496	0	36,205	115,324	659,755
All accounts	1-11	55,846	33,296	36,000	117,265	0	147,348	659,755	2,774,843

Table 44. Projected total employment and sources of employment change in specified industry groups, by source of employment change, West Minnesota, 1970-1980.

Code	Estimated 1970	National Growth	Industry Mix	Area (number)	Relative change		Projected 1980
					Total change	Total change	
COMMODITY-PRODUCING							
01	18,538	3,490	-9,577	2,633	-6,924	-3,434	15,104 ^{a/}
02	0	0	0	0	0	0	0
03	172	32	-51	41	-10	22	194
04	5,137	967	-180	-938	-1,038	-71	5,066
05	3,383	446	-393	35	-358	91	2,474
06	486	92	-75	-37	-112	-20	466 ^{b/}
07	0	0	0	0	0	0	0
08	569	197	-102	-15	-117	-10	559
09	888	197	-19	133	116	283	1,171
10	76	14	8	-30	-22	-8	68
11	541	192	104	-7	97	199	740
12	512	96	0	-182	-182	-86	426 ^{b/}
13	0	0	0	0	0	0	0
14	1,605	392	-45	1,326	1,161	1,463	3,068
TOTAL	30,997	5,818	-19,330	2,941	-7,389	-1,571	29,336
NON-COMMODITY PRODUCING							
15	1,000	295	-267	231	-35	169	1,259
16	1,679	316	92	-263	-171	145	1,824
17	48	84	69	-159	-81	3	451
18	977	184	118	-38	80	264	1,241
19	1,387	261	-68	28	-40	221	1,608
20	19,307	3,635	383	-3,139	-2,737	898	20,205
21	2,562	482	16	-190	-84	398	2,960
22	2,534	477	-331	15	-316	161	2,695
23	1,408	265	-471	836	365	630	2,038
24	1,730	326	-84	-79	-163	163	1,893
25	519	98	-4	-46	-53	45	564
26	17,804	3,352	3,269	-1,531	1,738	5,090	22,894
27	3,134	590	531	973	1,504	2,094	5,228
TOTAL	34,579	10,275	3,253	-3,247	6	10,281	64,860
ALL SECTORS	85,486	16,093	-7,077	-396	-7,383	8,719	94,196

a/ included in Sector 01; b/ included in Sector 06; c/ included in Sector 12.

Coupled with the shifts in employment are increases in worker productivity as measured by output per worker (table 45). The projected growth in productivity is based on certain assumptions about a geographically uniform diffusion of technology, industry by industry, on a national scale. Specific industry growth rates vary from 6.2 percent per year in agriculture to only 1.6 percent per year in professional and public administration services. An annual percentage increase in output per worker which exceeds the annual percentage increase in total output yields a declining industry employment, as in agriculture.

Industry Output and Demand

Projected industry output is the product of projected industry employment and output per worker. The two sets of data are used, therefore, to general the third set of data. Thus, the projected levels of area economic activity are based ultimately on the OBE employment projection series for the three OBE Economic Areas. This series is used, also, to determine the allocation of gross output between local and export markets. Area industry and local market requirements are satisfied and the residual output is "dumped" into export markets. In this sense, the projection procedure is supply-based rather than demand-based.*

Projected increases in local final demands above the 1963 base-year levels are linked to the assumed increase in per capital personal income in the area (table 46). The rate of growth is identical to the projected (OBE) percentage increase in the Fargo-Moorhead Economic Area.

Resource requirements and ecologic impacts

Projected primary input requirements are prepared the same as the 1963 allocations (table 47). Imports, again, are residual entries for the 29 industry groups.

In a second-round computer program iteration, the local demand estimates would be adjusted to personal income levels based on the total primary input allocation to the household sector.

Finally, the projected industry data are used in the computation of a new ecologic impact matrix. The 1980 interdependency matrix is derived, first, to show the direct and indirect effects of a \$1 increase in the final demand for a given industry output in 1980. The ecologic impact matrix is derived from the interdependency matrix and the ecologic input-output coefficients as was the case in the earlier presentation.**

* The alternative procedure starts with projected local and export demands rather than gross outputs. Note, again, that projected employment is by place of work in the input-output model (rather than place of residence, as in the shift-share model).

** Because the 1980 coefficients compare closely with the 1967 coefficients, the corresponding 1980 tables in the input-output projection series are not shown.

Table 45. Projected gross output, employment and output per worker in specified industry sectors, West Minnesota, 1980

Sector	Output (000S)	Exports (000S)	Employment (N)	Output/Emp (000S)	Exports/ Output (\$)
1 Agr Livestock	253388	93233	7046	35.9620	.3679
2 Crops	248687	161456	7045	35.2998	.6492
3 Serv For Fis	10817	0	1014	10.6677	.0000
4 Mining Construct	126187	0	4690	26.9055	.0000
5 Manu Meat Prod	64331	51900	692	92.9639	.8068
6 Dairy Prod	144230	136072	1006	143.3698	.9434
7 Food Feed	46080	5916	687	67.0742	.1284
8 Lumber Furn	9994	8699	279	35.8208	.8705
9 Printing	12513	0	617	20.2804	.0000
10 Stone Clay	8077	1526	296	27.2872	.1889
11 Machinerv	7747	0	585	13.2427	.0000
12 Other Manu	71827	0	1837	39.1002	.0000
13 Transportation	71889	51491	3534	20.3421	.7163
14 Commun Utilities	27054	0	1436	18.8398	.0000
15 Wholesale Agr	14440	0	1231	11.7303	.0000
16 Other	19479	0	2250	8.6573	.0000
17 Retail Eat Drink	35643	18326	3599	9.9036	.5142
18 Gas	22542	14281	1881	11.9841	.6335
19 Farm	9001	117	1297	6.9399	.0130
20 Other	47956	4759	9724	4.9317	.0992
21 Finance Ins Real	33082	0	2962	11.1688	0.0000
22 Serv Pers Bus	44462	9264	7190	6.1839	.2084
23 Prof	94216	55067	11312	8.3289	.5845
24 Public Const	8592	0	571	15.0473	.0000
25 Utilities	6562	0	347	18.9107	.0000
26 Ot Retail	2578	598	224	11.5089	.2318
27 Health	15532	11571	1392	11.1580	.7450
28 Education	93845	93185	10279	9.1298	.9930
29 Pub Adm	52057	52057	5228	9.9573	1.0000
Total	1602808	769518	90251	17.7594	.4801

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Table 46. Projected purchases of specific industry outputs, by final demand sector, West Minnesota, 1980.

Sector	(Inter- industry)	Gross Investment	Government		Households	Total Exports	Total Demands	Total Output
			Fed-State	Local				
1 Agr Livestock	158835	0	0	0	1320	93233	94553	253388
2 Crops	87231	0	0	0	0	161456	161456	248687
3 Serv For Fis	10817	0	0	0	0	0	0	10817
4 Mining Construct	47167	52853	6813	14592	4762	0	79020	126187
5 Manu Meat Prod	2529	0	0	0	9901	51900	61802	64331
6 Dairy Prod	2217	0	0	0	5941	136072	142013	144230
7 Food Feed	32737	118	15	33	7261	5916	13343	46080
8 Lumber Furn	468	118	15	33	660	8699	9526	9994
9 Printing	11713	0	0	0	800	0	800	12513
10 Stone Clay	3734	1066	137	294	1320	1526	4343	8077
11 Machinerv	4080	2610	336	720	0	0	3667	7747
12 Other Manu	26817	18007	2321	4971	19710	0	45010	71827
13 Transportation	15777	0	0	0	4621	51491	56112	71889
14 Commun Utilities	18137	0	0	0	8917	0	8917	27054
15 Wholesale Agr	14440	0	0	0	0	0	0	14440
16 Other	19071	125	16	35	233	0	408	19479
17 Retail Eat Drink	814	0	0	0	16502	18326	34829	35643
18 Gas	2980	0	0	0	5281	14281	19562	22542
19 Farm	8884	0	0	0	0	117	117	9001
20 Other	2271	0	0	0	40926	4759	45685	47956
21 Finance Ins Real	10973	0	0	0	22109	0	22109	33082
22 Serv Pers Bus	13415	0	0	0	21783	9264	31047	44462
23 Prof	11425	0	0	0	27724	55067	82791	94216
24 Public Const	0	6115	788	1688	0	0	8592	8592
25 Utilities	4119	0	0	0	2443	0	2443	6562
26 Ot Retail	0	0	0	0	1980	598	2578	2578
27 Health	0	0	0	0	3961	11571	15532	15532
28 Education	0	0	0	0	660	93185	93845	93845
29 Pub Adm	0	0	0	0	0	52057	52057	52057
Total	510651	81013	10443	22366	208817	769518	1092157	1602808

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Table 47. Projected sales of primary inputs to specified industry group, by primary input sector, West Minnesota, 1980.

Sector	(Inter-Industry)	Gross Saving	Government		Households	Imports	Primary Inputs	Total Output
			Fed-State	Local				
1 Agr Livestock	155508	12923	0	2027	42823	40108	97880	253388
2 Crops	46082	26610	0	6466	118872	50658	202605	248687
3 Serv For Fis	2904	984	0		3505	3327	7913	10817
4 Mining Construct	46845	20947	3028	1136	18549	35682	79342	126187
5 Manu Meat Prod	20287	5211	322	193	6690	31628	44044	64331
6 Dairy Prod	109833	2740	144	433	9231	21849	34397	144230
7 Food Feed	8828	4378	138	138	5760	26838	37232	46080
8 Lumber Furn	1626	510	190	90	2419	5160	8368	9994
9 Printing	2238	1301	163	125	5043	3644	10275	12513
10 Stone Clay	513	420	57	40	1527	5520	7564	8077
11 Machinery	751	519	147	85	2262	3982	6996	7747
12 Other Manu	15236	4956	72	215	16951	34397	56591	71827
13 Transportation	6251	7476	4673	3810	25736	23943	65639	71889
14 Commun Utilities	7758	6493	433	947	8798	2685	19296	27054
15 Wholesale Agr	3660	2339	924	130	4332	3055	10780	14440
16 Other	3082	1227	749	97	11259	3074	16397	19479
17 Retail Eat Drink	7212	428	1996	107	14542	11358	28431	35643
18 Gas	5904	1378	293	180	10775	3811	16698	22542
19 Farm	1789	981	621	297	4131	1181	7212	9001
20 other	6909	4356	1822	719	22443	11506	41047	47956
21 Finance Ins Real	4854	1290	2613	595	16905	6824	28218	33082
22 Serv Pers Bus	6128	3112	1023	934	24276	8990	38334	44462
23 Prof	12335	4428	1696	3015	57189	15553	81881	94216
24 Public Const	2651	481	223	249	3145	1842	5941	8592
25 Utilities	2086	1116	144	354	2159	703	4476	6562
26 Ot Retail	695	245	98	39	1297	295	1883	2578
27 Health	2103	1910	730	124	8263	2401	13429	15532
28 Education	17098	282	94	4317	62970	9084	76747	93845
29 Pub Adm	4485	156	52	2395	34930	5039	42572	52057
Total	510651	119598	22437	29356	546633	374134	1092157	1602808

Fiscal-Ecologic Accounts

Projected levels of economic activity in each of the 50 sectors identified earlier are summarized in a series of tables which represent the fiscal-ecologic accounts of the area economy for the target year 1960 (see tables 48, 49, 50 and 51). These accounts show the individual sectoral implications of the projected levels of income, output and employment presented in tables 45, 46 and 47.*

Of particular importance in this study are the data provided for assessment of industry linkages with proposed resource development projects in terms of both resource requirements and financing sources. On the one hand the projected increases in industry outputs imply increases in area demand for water resources; these increases also imply expanded sources of public and private financing.

Disbursements of gross income for each sector, which generally follow 1967 patterns, are influenced by the added assumptions introduced in the preparation of the 1980 accounts, namely, that an increasing share of public industry outlays are recovered from public financing sources and that an increasing share of public financing is derived from state (and federal governments derive substantially higher levels of indirect and direct tax revenues from households and businesses in the 14-county area. Thus, the projected balance of payments situation (which is discussed later in these chapters) is likely to remain roughly as it was in the base year, 1967.

Public Outlays

The preceding data provide the basic economic series for showing future levels of public outlays associated with specified levels of resource development in the study area. Projected levels of local current expenditures for example, are derived from the input-output data (i.e., public industry inputs, outputs and demands). Capital expenditure levels are related to total population, growth in total economic activity, and the availability of public funds. Total capital outlays of local governmental units are shown under government purchases -- federal, state and local. Thus the projected levels of public outlays are partly exogeneous data in the input-output model.

Current Expenditures

Current local government expenditures in West Minnesota are projected to increase from \$205,887,000 in 1967 to \$350,359,000 in 1980 (see columns 24 to 27 and 37 to 41) in fiscal-ecologic accounts, table 52). Included in these totals is a projected increase in public industry outlays from

* For the most part 1967 patterns of intersectoral linkages were assumed in the preparation of the 1980 accounts. Business losses, however, were not allowed, nor were industry payments of unemployment insurance premiums included (in the indirect tax payments). And, again, the individual entries in the fiscal-ecologic accounts are consistent with corresponding entries in the input-output tables.

Table 48. Estimated income payments of private industry (Class 1) sectors to specified income-receiving sectors, West Minnesota, 1980.^{1/}

Income receiving sectors	Sector number	Agricultural		Agricultural services, forestry, fisheries	Construction, Mining	Food products			Lumber, furniture	Printing, Publishing	Stone, Clay Products
		Live-stock	Crops			Meat	Dairy	Other			
		1	2	3	4	5	6	7	8	9	10
Private industry	1-23	155,274	45,852	2,847	46,728	20,287	109,700	8,785	1,617	2,226	506
Public industry	24-29	234	230	30	117	0	133	43	19	12	7
Sales tax	31	336	506	28	1,596	170	76	105	102	83	28
Property tax	32	1,998	6,427	90	927	169	348	113	86	120	38
Assessments	33	31	39	7	209	24	85	25	4	5	2
Other taxes	34	310	452	27	1,432	152	68	33	88	80	29
Business	35	5,685	0	0	18,685	4,633	0	3,319	158	863	106
Household	36	42,823	118,872	3,505	18,549	6,690	9,231	5,760	2,419	5,043	1,527
Depreciation	45	6,591	25,651	929	2,262	578	2,740	1,059	351	437	314
ROW	50	40,108	50,658	3,327	35,682	31,628	21,849	26,838	5,160	3,644	5,520
Subtotal	30-50	97,880	202,605	7,913	79,342	44,044	34,397	37,252	8,368	10,275	7,564
Totals	1-50	253,388	248,687	10,817	126,187	64,331	144,230	46,080	9,994	12,513	8,077

1/ For comparison with the earlier input-output tables, sales and other taxes equal payments to federal and state governments; property tax and special assessments equal payments to local government; and business income and depreciation reserves equal gross savings.

Table 48. (Continued)

Income receiving sectors	Machinery	Other	Transportation	Communication, utilities	Wholesale Trade		Retail trade			FIRE	Services		
					Agricultural	Other	Eating drinking places	Gas Stations	Farm machinery		Other	Personal, business	Professional
	11	12	13	14	15	16	17	18	19	20	21	22	23
Private industry	744	15,103	6,184	7,132	3,607	3,028	7,014	5,821	1,764	6,776	4,793	5,922	11,899
Public industry	7	133	67	626	53	54	198	83	25	133	61	206	436
Sales tax	72	38	2,467	229	495	399	1,894	156	317	958	536	536	899
Property tax	83	200	3,631	928	118	89	98	163	269	659	588	902	2,912
Assessments	2	15	179	19	12	8	9	17	28	60	7	32	103
Other taxes	75	34	2,206	204	429	341	102	137	304	864	2,077	487	797
Business	349	3,013	2,662	3,818	1,848	565	0	813	676	2,926	0	0	0
Household	2,262	16,951	25,736	8,738	4,332	11,259	14,542	10,775	4,131	22,443	10,905	24,276	57,189
Depreciation	171	1,943	4,814	2,675	491	662	428	766	306	1,631	1,291	3,111	4,428
ROW	3,982	34,397	23,943	2,685	3,055	3,074	11,358	3,811	1,181	11,506	6,824	8,990	15,553
Sub-total	6,996	56,591	65,638	19,296	10,780	16,397	28,431	16,638	7,212	41,047	28,228	38,334	81,881
Totals	7,747	71,827	71,889	27,054	14,440	19,479	35,643	22,542	9,001	47,956	33,082	44,462	94,216

Table 49. Estimated income payments of public industry (Class 2), household consumption(Class 3), and public finance (Class 4) sectors to specified income-receiving sectors, West Minnesota, 1980.^{1/}

Income receiving sectors		Class 2					Public	Class 3				
		Construc- tion 24	Util- ities 25	Other retail 26	Health 27	Educa- tion 28		Household consump- tion 30	Sales tax 31	Proper- ty tax 32	Assess- ments 33	Other taxes 34
Private industry	1-23	2635	1861	688	2074	16490	9148	185970	0	0	0	0
Public industry	24-29	16	225	7	29	608	337	9924	0	0	0	0
Sales taxes	31	10	8	4	14	6	3	20320	0	0	0	0
Property taxes	32	0	0	0	0	0	0	32415	0	0	0	0
Assessments	33	25	29	6	42	233	132	787	0	0	0	0
Other taxes	34	40	42	11	73	90	50	12600	0	0	0	0
Household	36	3145	2159	1207	8263	62970	34930	0	0	0	0	0
County	37	0	0	0	0	0	0	0	0	17420	272	37
Municipal	38	0	0	0	0	0	0	0	0	5063	1848	3433
Township	39	0	0	0	0	0	0	0	0	2456	0	0
School District	40	0	0	0	0	0	0	0	0	24564	0	1601
Spec. District	41	0	0	0	0	0	0	0	0	0	56	2
State	42	0	0	0	0	0	0	0	22299	3866	0	10118
Federal	43	0	0	0	0	0	0	0	11624	0	0	8443
Property income	44	0	0	0	0	0	0	0	0	0	0	0
Public industry	46	155	650	88	1429	8634	4789	0	0	0	0	0
Household consump.	47	0	0	0	0	0	0	0	0	0	0	0
Institutional	48	724	885	272	1207	-4270	- 2371	57500	0	0	0	0
Ecologic	49	0	0	0	0	0	0	0	0	0	0	0
ROW	50	1842	703	295	2401	9084	5039	192782	0	0	0	0
Subtotal	30-50	5941	4476	1883	13429	76747	42572	348353	33923	53369	2176	23634
Totals	1-50	8592	6562	2578	15532	93845	52057	544247	33923	53369	2176	23634

^{1/} Income payments of the public industry (Class 2) sectors to the public finance accounts are less, per \$1 of total outlay, than corresponding industry sectors; the difference is absorbed in the ROW sector (Row 50). Capital outlays of the household (Class 3) sector are included under the capital (Class 8) sector except the allocation for depreciation (Row 47) and interest (Row 48) payments.

Table 50. Estimated income payments of institutional (Class 5) sectors to specified income-receiving sectors, West Minnesota, 1980.

Income Receiving Sectors		Busi- ness 35	House- hold 36	Local Government					State gov't. 42	Fed. gov't. 43	Prop. inc. 44
				County 37	Munic. 38	Town- ship 39	School dist. 40	Special dist. 41			
(\$1,000)											
Constr.	24	0	0	5155	1719	1718	0	0	0	0	0
Health	27	0	0	391	29	0	0	0	10036	1115	0
Educ.	28	0	0	1530	367	0	59393	0	27604	3411	0
Pub. ad.	29	0	0	18391	3295	1012	0	609	8025	20725	0
Subtotal	24-29	0	0	25467	5410	2730	59393	609	115665	25251	0
Househ. consump.	30	0	544247	0	0	0	0	0	0	0	0
Prop. tax	32	0	0	0	0	0	0	0	0	0	0
Housch.	36	21347	0	13068	125	141	0	0	0	32914	50119
County	37	0	0	0	0	0	0	0	24364	243	0
Municipal	38	0	0	276	0	0	0	0	1405	63	0
Township	39	0	0	158	0	0	0	0	247	0	0
School dist.	40	0	0	3743	0	0	479	0	32753	0	0
Spec. dist.	41	0	0	17	0	0	0	0	0	29	0
State	42	2318	14036	0	0	0	0	0	0	0	0
Federal	43	17628	106745	0	0	0	0	0	0	0	0
Prop. inc.	44	5243	0	0	0	0	0	0	0	0	0
Public ind.	46	0	0	0	0	0	0	0	0	0	0
Househ. consumpt.	47	0	0	0	0	0	0	0	0	0	0
institutional	48	3583	31972	21038	15137	0	22936	0	0	0	0
Subtotal	30-50	50119	697000	38300	15262	141	23415	0	58769	33249	50119
Totals	1-50	50119	697000	63767	20672	2871	82808	609	104434	58500	68464

^{1/} Income payments of local government sectors to the public industry sectors cover a portion of total outlays not covered by service charges. Any remaining outlays are covered by the income payments of state and federal governments. Because of the limitations of the input-output format presented earlier, these entries were consolidated earlier in the export sector.

Table 51. Estimated income payments of private industry (Class 6), public industry (Class 7), household consumption (Class 8), and institutional (Class 9), capital sectors, and ecologic (Class 10) and rest of world (Class 11) to specified income receiving sectors, West Minnesota, 1980.

	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11
Income receiving sectors	Private 45	Public 46	Household consump. 47	Institu- tional 48	Eco- logic 49	Rest of world 50
	(\$1,000)					
Mining, constr.	4	52853	21405	4762	0	0
Food products	7	118	49	0	0	5916
Lumber, furniture	8	118	49	660	0	8699
Stone, clay prod.	10	1066	437	1320	0	1526
Machinery	11	2610	1056	0	0	0
Other manufact.	12	18007	7292	6945	0	0
Other wholesale	16	125	51	116	0	0
Other	1-23	74897	30333	13803	0	612107
Other retail	26	0	0	0	0	598
Subtotal	1-29	74897	30333	13803	0	616705
Sales taxes	31	696	0	836	0	0
Business	35	0	0	0	0	0
Household	36	0	0	0	32654	0
County	37	0	0	0	21431	0
Municipal	38	0	0	0	8584	0
Township	39	0	0	0	10	0
School district	40	0	0	0	19668	0
Special district	41	0	0	0	505	0
State	42	0	0	0	0	51797
Federal	43	0	0	0	0	85940
Property income	44	0	0	0	44876	0
Private industry	45	0	0	0	23960	0
Public industry	46	0	0	0	36419	0
Household consum.	47	0	0	0	0	0
Institutional	48	0	0	0	0	65045
ROW	50	11996	21831	42861	0	0
Subtotal	30-50	12692	21831	43697	188107	30902
Totals	1-50	47589	52164	57500	188107	643607

1/ Income payments of the capital sectors convert the final demands of the business, household and government sectors identified earlier in the input-output tables. Private industry (Sector 45) payments are identical to gross investment and public industry (Sector 46) payments are identical to government purchases. Household consumption (Sector 47).

Table 52. Projected income receipts from specified sectors, by current account class, West Minnesota, 1980.

Sector	Sector Number	Class 1 (\$1,000)	Class 2	Class 3	Class 4	Class 5
Agr. Livestock	1	158835	0	1229	0	0
Agr. crops	2	87231	0	0	0	0
Ag. serv. for.	3	10817	0	0	0	0
Mining constr.	4	40343	6824	4433	0	0
Meat prod. mfg.	5	2235	295	9217	0	0
Dairy Prod.	6	1522	695	5531	0	0
Other food prod.	7	32574	162	6759	0	0
Lumber, furn.	8	297	171	614	0	0
Printing, pub.	9	2469	9244	745	0	0
Stone, clay	10	3258	476	1229	0	0
Machinery	11	4058	23	0	0	0
Other manufacturing	12	25120	1698	18348	0	0
Transportation	13	15298	479	4302	0	0
Comm., utilities	14	13097	5040	8301	0	0
Wholesale agr.	15	14411	29	0	0	0
Other wholesale	16	18154	916	217	0	0
Eat, Drink places	17	786	29	15362	0	0
Gas stations	18	2939	41	4916	0	0
Farm equipment	19	8884	0	0	0	0
Other retail	20	1443	828	38098	0	0
FIRE	21	10555	418	20582	0	0
Per., bus. services	22	10687	2728	20278	0	0
Prof. services	23	8625	2800	25809	0	0
Public construction	24	473636	32896	185970	0	10209
Utilities	25	2896	1222	2443	0	0
Other retail	26	0	0	1980	0	0
Health	27	0	0	3961	0	8592
Education	28	0	0	1540	0	92305
Administration	29	0	0	0	0	52057
Household const.	30	0	0	0	0	544247
Sales taxes	31	12026	45	20320	0	0
Property taxes	32	20954	0	32415	0	0
Assessments	33	922	467	787	0	0
Other taxes	34	10728	306	12600	0	0
Business	35	50119	0	0	0	0
Household	36	433958	112674	0	0	117714
County	37	0	0	0	17729	24607
Municipal	38	0	0	0	10344	1744
Township	39	0	0	0	2456	405
School dist.	40	0	0	0	26165	36975
Special dist.	41	0	0	0	58	46
State	42	0	0	0	36283	16354
Federal	43	0	0	0	20067	124373
Property inc.	44	0	0	0	0	5243
Private industry	45	63629	0	0	0	0
Public industry	46	0	15745	0	0	52490
Household cons.	47	0	0	57500	0	0
Institutional	48	0	-3553	31949	0	94666
Ecologic	49	0	0	0	0	0
ROW	50	354773	19364	192782	0	0
Totals	1-50	1423642	179166	544247	113102	1130899

\$95,505,000 in 1967 to \$179,166,000 in 1980. Much of the increase in public industry outlays is possible because of the projected increases in state and federal outlays (\$47,937,000 and \$23,972,000, respectively) to local governments (see columns 42 and 43 in fiscal-ecologic accounts).

Public outlays for water resource development are included in the public industry sectors, namely, construction (roads, parks, and other projects for which a local government work force is used), utilities (water and sewer), and administrative (all other primarily tax supported public functions). Current outlays in these three sectors are projected to increase from \$33,259,000 to \$67,211,000 -- a total increase of \$33,952,000 over the 13-year period.

Capital Expenditures

Capital expenditures data for local governments are summarized under public industry (sector 46) and institutional (sector 48) accounts. Because of the aggregation of individual accounts, however, important detail, such as the functional category of expenditures and specific unit of local government, is missing (table 53). The capital accounts to summarize the additional detail would require a larger table than the 50-by-50 sector layout for presentation.

The summary accounts show a projected increase in public industries capital outlays from \$33,296,000 in 1967 to \$52,164,000 in 1980 (table 54). The projected increase in capital outlays is comparable with the projected increase in public industry current outlays (from \$95,505,000 to \$179,166,000 over the 13-year period). Thus, the total annual outlays for the public industries are projected to increase from \$126,801,000 to \$231,330,000 -- an average annual increase of \$8.8 million. Capital outlays for water-related public facilities are included in the projected increases.

Financing Sources

Financing sources of local governments are identified, in part, in the discussion of current and capital expenditures. These outlays represent a flow of funds from one governmental unit to another, e.g., state government to county government or, directly, to a public industry, such as education.

All sources of local government income are represented in the fiscal accounts, including private industry and household consumption (i.e., service charges, property taxes and special assessments), public industry (i.e., service charges and special assessments), and governmental units (i.e., grants and other transfer payments).

Service Charges

Use of service charges is confined principally to three public industry sectors -- water (and electric power) utilities, retail trade (municipal liquor stores), and hospitals (municipal and county). Significant changes in the use of service charges in the water-related public industries are not anticipated. For example, public utility industry (sector 23) receipts from private industry sectors are projected to increase from only \$1,710,000 in

Table 53. Projected income receipts from specified sectors, by capital account class, West Minnesota, 1980.

Sector	Sector Number	Class 6	Class 7	Class 8	Class 9	Class 11	Totals
Agr. Livestock	1	0	0	91	0	93233	253388
Agr. crops	2	0	0	0	0	161456	248687
Ag. serv. for.	3	0	0	0	0	0	10817
Mining constr.	4	52853	21405	329	0	0	126187
Meat prod. mfg.	5	0	0	684	0	51900	64331
Dairy prod.	6	0	0	410	0	136072	144230
Other food prod.	7	118	49	502	0	5916	46080
Lumber, furn.	8	118	49	46	0	8699	9994
Printing, pub.	9	0	0	55	0	0	12513
Stone, clay	10	1066	431	91	0	1526	8077
Machinery	11	2610	1056	0	0	0	7747
Other mfg.	12	18007	7292	1362	0	0	71827
Transport.	13	0	0	319	0	51491	71889
Comm., util.	14	0	0	616	0	0	27054
Wholesale	15	0	0	0	0	0	14440
Other wholesale	16	125	51	16	0	0	19479
Eat, drink, Pl.	17	0	0	1140	0	18326	35643
Gas stations	18	0	0	365	0	14281	22542
Farm equip.	19	0	0	0	0	117	9001
Other retail	20	0	0	2828	0	4759	47956
FIRE	21	0	0	1527	0	0	33082
Per., bus. serv.	22	0	0	1505	0	9264	44462
Prof. serv.	23	0	0	1915	0	55067	94216
Public constr.	24	0	0	0	0	0	8592
Utilities	25	0	0	0	0	0	6562
Other retail	26	0	0	0	0	598	2578
Health	27	0	0	0	0	0	15532
Education	28	0	0	0	0	0	93845
Administration	29	0	0	0	0	0	52057
Household cons.	30	0	0	0	0	0	544247
Sales taxes	31	686	0	836	0	0	33923
Prop. taxes	32	0	0	0	0	0	53369
Assessments	33	0	0	0	0	0	2176
Other taxes	34	0	0	0	0	0	23634
Business	35	0	0	0	0	0	50119
Household	36	0	0	0	32654	0	697000
County	37	0	0	0	21431	0	63767
Municipal	38	0	0	0	8584	0	20672
Township	39	0	0	0	10	0	2871
School dist.	40	0	0	0	19668	0	82808
Special dist.	41	0	0	0	505	0	609
State	42	0	0	0	0	51797	104434
Federal	43	0	0	0	0	-85940	58500
Property inc.	44	0	0	0	44876	0	50119
Private industry	45	0	0	0	23960	0	87589
Public industry	46	0	0	0	36419	0	52164
Household cons.	47	0	0	0	0	0	57500
Institutional	48	0	0	0	0	65045	188108
Ecologic	49	0	0	0	0	0	0
ROW	50	11996	21831	42861	0	0	643607
Totals		87589	52164	57500	188107	643607	4420023

Table 54. Summary of projected income receipts from specified sources, by account class, West Minnesota, 1980

Income	Account Class	Current					Total
		Industry		Household cons.	Public finance	Institutional	
		Private 1	Public 2				
Current accounts:							
Private industry	1	473,636	32,896	185,970	0	0	692,502
Public industry	2	2,897	1,222	9,924	0	164,525	178,568
Household consumption	3	0	0	0	0	544,247	544,247
Public finance	4	44,630	818	66,122	0	0	111,570
Institutional	5	484,077	112,674	0	113,102	327,461	327,461
Total	1-5	1,005,240	147,610	262,016	113,102	1,036,233	1,037,314
Capital accounts:							
Private industry	6	63,629	0	0	0	0	63,629
Public industry	7	0	15,745	0	0	0	15,745
Household consumption	8	0	0	57,500	0	0	57,500
Institutional	9	0	-3,553	31,949	0	94,666	121,911
Ecologic	10	0	0	0	0	0	0
Rest of world	11	354,773	19,364	192,782	0	0	566,919
Total	6-11	418,402	31,556	282,231	0	94,666	825,704
All accounts		1,423,642	189,166	544,247	113,102	1,130,899	3,389,905

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Table 54. (Continued).

Income	Capital						Total	All accounts
	Industry		Household cons.	Institutional	Ecologic	Rest of World		
	Private 6	Public 7						
Current accounts:								
Private industry	74,897	30,333	13,803	0	0	612,107	731,140	1,423,642
Public industry	0	0	0	0	0	598	598	179,166
Household consumption	0	0	0	0	0	0	0	344,247
Public finance	696	0	836	0	0	0	1,532	113,102
Institutional	0	0	0	128,194	0	-34,143	93,585	1,136,599
Total	75,593	30,333	14,639	128,194	0	578,562	796,855	3,391,056
Capital accounts:								
Private industry	0	0	0	23,960	0	0	23,960	87,589
Public industry	0	0	0	36,419	0	0	36,419	52,169
Household consumption	0	0	0	0	0	0	0	57,500
Institutional	0	0	0	0	0	65,045	65,045	188,107
Ecologic	0	0	0	0	0	0	0	0
Rest of world	11,996	21,831	42,861	0	0	0	76,688	643,607
Total	11,996	21,831	42,861	60,379	0	65,045	202,112	1,028,967
All accounts	87,589	52,164	57,500	188,107	0	643,607	1,028,967	4,420,023

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1967 to \$2,897,000 in 1980. For the household sector, the projected increase in service charges paid to public utilities is from \$1,525,000 to \$2,443,000 -- a small increase, indeed, when compared with total household expenditures.

Income from service charges in the education and health sectors (in the form of tuition and hospital fees) is projected to increase only moderately -- from \$3,658,000 in 1967 to \$5,501,000 in 1980. In these two sectors, particularly, the projected growth in income from service charges is less rapid than the projected overall growth of each sector. Other public income sources thus assume a proportionately larger share of the total financing.

Property Taxes and Special Assessments

Of the four categories of indirect taxes, only income from property taxes and special assessments is available immediately for financing local government activities. These two income sources also lag behind the growth in total public industry outputs.

At least two reasons account for the reduced rates of increase in local property taxes and assessments, the first being the enactment of a state sales tax as a means of reducing the tax burden on real estate (figure 6). The immediate reaction to the new tax source was a sharp drop in taxable valuation, but in addition its annual rate of increase was reduced. By 1971, taxable valuation in the 14-county area was approximately \$35 million less than indicated by the 1967-68 pre-sales tax trend.

Enactment of a state sales tax was accompanied by an increase in transfer payments from state government to local governments. These payments accounted for an increasingly larger share of local government financing. Thus, local government expenditures (as illustrated graphically in the case of municipal and county current expenditures) maintained a consistent rate of increase over the 1967-1971 period.

Property tax revenues as a percentage of total taxable valuation has increased over the 1967-1971 period. Increases in property tax yield per dollar of taxable valuation have occurred recently in the case of county government, for example (figure 7). As shown by the fiscal data for West Minnesota, the burden of local government on local property has not been reduced despite the growing dependence of local governments on transfer payments.

Transfer Payments

An increasing reliance of local governments on income derived from state and federal sources has been implicit in the preceding discussions and the projected levels of local government finances. However, much of the additional revenues from transfers payments are allocated to health, education and welfare rather than water resource development.

Water-related local capital improvements are financed largely from the sale of revenue bonds and other local government obligations. For

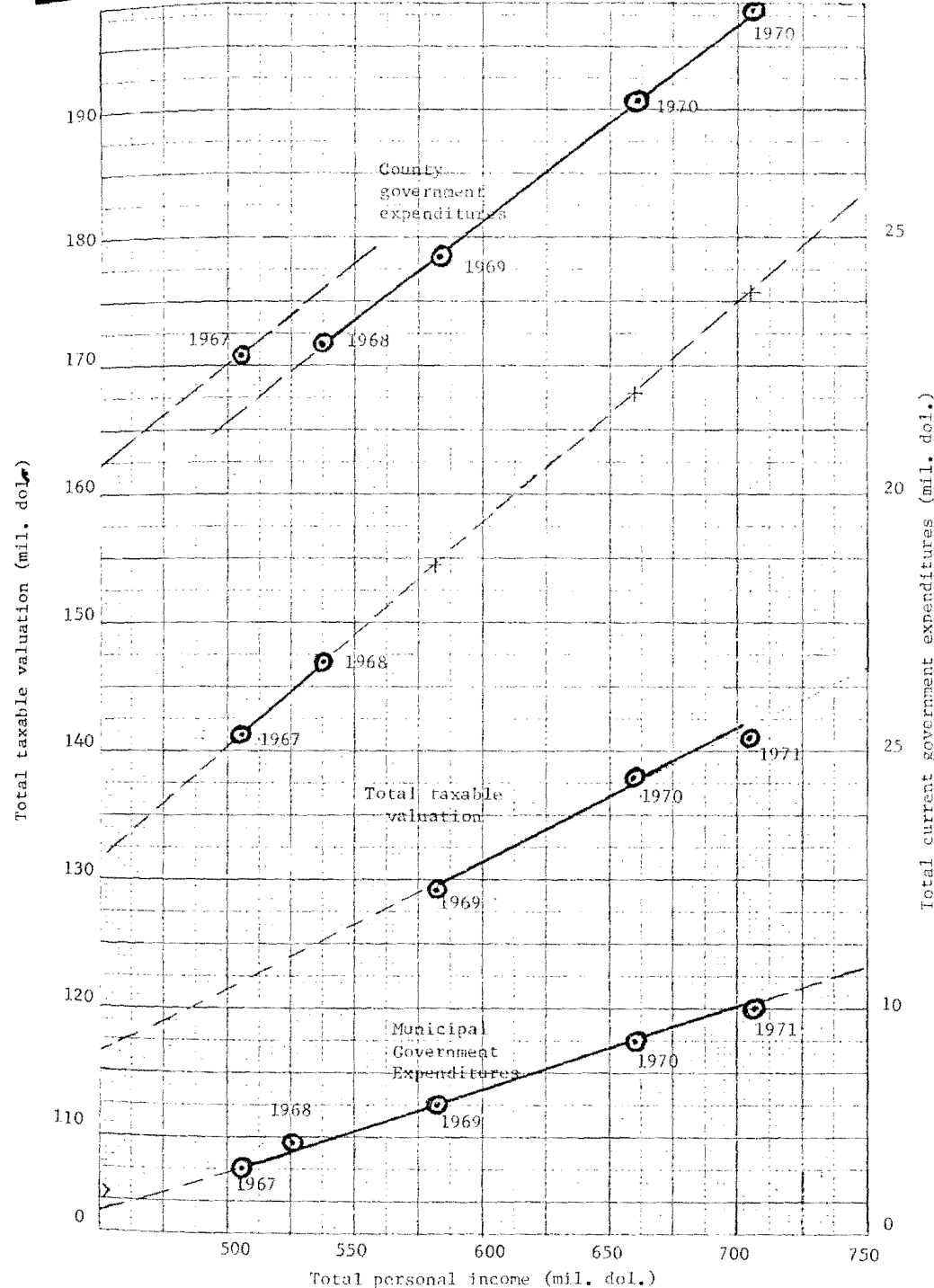


Fig. 6. Relation of taxable valuation and municipal and county current expenditures to personal income, West Minnesota, 1967-1971.

small municipalities, however, the lack of any market for municipal bonds restricts their funding sources to transfer payments (i.e., construction grants) or the use of alternative government structures for planning and financing water-related capital improvements. Organization of multi-municipal and multi-county fiscal planning and tax districts thus would substantially enhance the financing prospects facing small municipalities in West Minnesota.

Capital Improvements

A shift from a municipal or county scale of development financing to an area or regional scale may require new fiscal planning techniques. One possibility is the use of regional capital budgets and programs as a means of providing local inputs in an areawide effort to coordinate and facilitate the resource planning process (1a, 3, 12a, 19, 37a, 51a, 73b, 76, 78).

Regional Capital Budgets

The capital accounts presented in the preceding tables may serve as summary components of a regional capital budget. These accounts would be extended to the nine resource development areas cited in Chapter II. Such an extension would require detailed capital entries for each sector. These entries would be summary statements of the financing implications of proposed capital outlays. The local fiscal impacts thus would be presented in the context of total governmental, industry and household expenditures in the area or region.

Preparation of a regional capital budget for Region 4, for example, would involve some degree of coordination of capital expenditure and financing estimates and projections of local governmental units. Basic data for a coordinated regional capital budget are available in the statistical reports consulted in the preparation of the 1967 and projected 1980 fiscal-ecologic accounts for West Minnesota. In addition, each unit of local government would need to be consulted about proposed and/or needed capital outlays and these data would need to be collated with corresponding capital outlay data from state and federal agencies. Finally, employment and income projections for the private sector, particularly the export-producing industries, would need to be prepared as a basis for critically evaluating the assumptions of alternative public capital outlay plans.

Projected Public Outlays. Projected public outlays in West Minnesota are linked ultimately to projected population and income levels in the study areas as follows:

1. Public industry outlays (sectors 24 to 29 and sector 46): a function of projected levels of final demand for public industry output (i.e., private industry purchases on current and capital account from the public utility sector, household purchases from the public utility, other retail, health and education sectors, capital purchases of local, state and federal agencies in the area) and institutional outlays (which relax the capacity constraints of the public industry sectors).

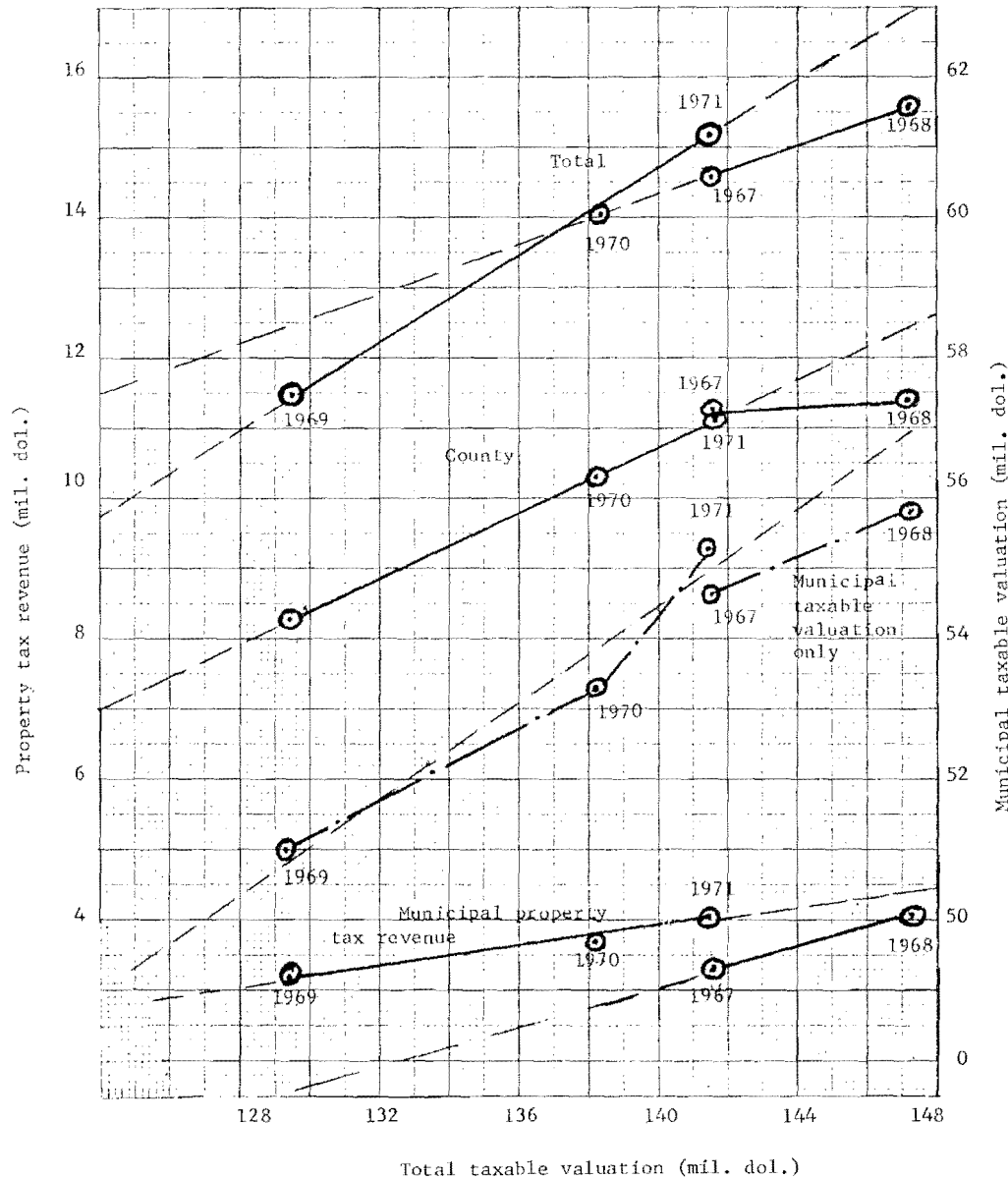


Fig. 7. Relation of municipal taxable valuation and county and municipal property tax revenues to total (municipal and other) taxable valuation, West Minnesota, 1967-71.

2. Institutional (i.e., local, state and federal government) outlays; a function of projected levels of population and per capita income (with different weights being applied to place of residence, such as metropolitan area, city, village and open country).

State and federal policies would provide a basis for attaching appropriate weights to the population and income variables for one area as compared with another area. A series of area projections might be prepared with different weights associated with these variables, depending upon the proposed policy alternative.

Data presented earlier (in Chapter II) refer to large capital outlay needs in West Minnesota, especially among small municipalities. Given certain public financing limitations, all desired municipal improvements will not be made. Some sort of a priority-setting process will be in effect to reconcile these needs with available public financing. The regional capital budget thus would provide an aggregate data base for regional priority setting in the context of total regional public outlays.

Projected Public Financing. Projected public financing, like public outlays, is linked ultimately to personal income levels in the planning area. Some intermediate variables are important, however, such as the following:

1. Taxable valuation: a function of total economic activity in the area (as represented by the current level of total personal income payments).
2. Income from property taxes and special assessments: a function of total taxable valuation.
3. Income from service charges: a function of total municipal population and per capita personal income.
4. Income from transfer payments: a function of total population and per capita personal income.
5. Income from other sources: a function of total population and earnings per worker.

Each of the sources of public income is identified in the area fiscal accounts. Historical data series were prepared to estimate the functional relationships used in the fiscal projection procedures.

The regional capital budgets reconcile the projected levels of public outlays with projected levels of public financing. Increasing dependence on transfer payments is assumed, but these increases are used primarily to support health, welfare and education functions, which are the most rapidly increasing categories of local government expenditures.

A comprehensive approach to public investment planning would focus on the proposed public investments of "regional impact", i.e., a proposed capital improvement which serves the people of a multi-county area rather than a single municipality or neighborhood. Because of the extra-local ("spill-

over") effects, each of the nine resource development activities cited earlier (in Chapter II) qualifies, at least in part, as a development activity of regional impact. Establishment of a Regional Development Commission in Region 4 makes possible an early attempt to implement a comprehensive approach in multi-county resource development.

To facilitate the work of the Regional Development Commission in regional investment planning and programming, a technical capability is needed in preparing scenarios of alternative regional futures based on alternative regional resource development strategies. Such a capability would involve use of a computable model of regional growth and development and preparation of a series of regional capital budgets for each set of regional development alternatives. Use of both the computable model and the capital budgets are likely outcomes of current research efforts. This study provides one of the components of the needed technical capability.

Financing Alternatives

Area financing alternatives are represented in part in a summary statement of local government indebtedness in the study area (table 55). Local alternatives in bond financing are confined, however, to count school districts and the large municipalities (19). An areawide approach to fiscal pooling still leaves the small municipalities without adequate financing as long as proposed public investments in small municipalities are of low priority relative to similar investments in large municipalities.

Funding sources outside West Minnesota for resource development activities in West Minnesota are limited, also, as shown by data on recent levels of funding in Minnesota for water and sewer systems (table 56). For example, special assessment bonds outstanding in West Minnesota on December 31, 1972 were about equal to the total level of federal funding of water and sewer systems in Minnesota in 1972. New state legislation provides for an additional \$30 million of state funding of municipal water and sewer systems, but, again, the higher funding priorities are being established for areas of rapid population growth rather than West Minnesota municipalities. Thus, the funding of water-related resource development in West Minnesota is restricted by (1) lagging economic growth in the area, (2) lack of markets for local municipal bonds, and (3) low federal and state funding priorities for area infrastructure development, including water and sewer systems.

Table 55. Reported indebtedness of local government units in specified bonds outstanding, West Minnesota, December 31, 1972.

Bonds outstanding	County	Municipal	Township (\$1,000)	School District	Special District ^{1/}	Total
General obligation	1,927	10,192	36	47,507	649	60,311
Special assessment	76	14,978	0	0	0	15,054
Revenue	1,060	8,158	0	0	0	9,218
Refunding	0	694	0	995	0	1,689
Other ^{2/}	1,210	480	0	0	0	1,690
Total	4,273	34,502	36	48,502	649	87,962

^{1/} Housing and Redevelopment Authority, Sanitary District, and Hospital District

^{2/} FHA loan and state aid bond

Table 56. Reported federal funding for municipal sewer and water systems, Minnesota, 1969-1972.^{1/}

Funding source	1969	1970	1971	1972
	(\$1,000)			
U.S. Department Agriculture: Rural water and waste disposal grants	345	654	606	886
U.S. Department of Housing and Urban Development Water and sewer facility grants	270	3,789	3,887	2,406
U.S. Department of Interior: Waste treatment works construction grants	3,599	2,985		
Water supply and pollution control	627	756		
U.S. Environmental Protection Agency: Waste water treatment Works construction grants			11,155	12,006
Total	4,849	8,184	15,648	15,298

^{1/} U.S. Treasury Dept., Federal Aid to States (FY 1969-1972), Washington, D.C.

CONCLUSIONS

Area financing of water resource development depends, first, on the organization of an area resource development agency, such as the multi-county Regional Development Commission (RDC) in Minnesota. Access to an area funding source is needed, too, along with governmental capability for establishing area development priorities.

Selection of a multi-county area in West Minnesota for the study of financing alternatives in water resource development achieved, in part, the initial prerequisites for the study. Within the 14-county study area, a multi-county RDC has been established. In addition, seven of the 14 counties are part of a special-purpose, multi-county resource development activity (i.e., the West Minnesota Resource Conservation and Development Project). Finally, the study area is marked by a wide range of water-related problems. The financing requirements of local projects to deal with these problems greatly exceed the current fiscal capabilities of local governments.

Substantial increases in public funding sources would not reduce the public financing gaps in West Minnesota. Other public functions in West Minnesota, besides water-resource development, compete for available local funds. In addition, water resource development priorities in West Minnesota rank below those for other parts of the state, especially in rapidly growing areas.

Because of the two-fold problem of a limited local tax base and low priority rankings for water resource development projects in West Minnesota, a major part of this study involved preparation of data and procedures for constructing a computable model of the total economy of the study area. Major emphasis has been placed on the public sectors, particularly public finances. A computable regional model has been developed. Baseline series of estimates and projections have been prepared and procedures for relating the technical capability to the resource planning process have been initiated in related research studies.

Area Economic Relationships

The computable economic model contains the critical economic relationships of the area -- internal and external. The public sector is differentiated from the private sector and area-funding industries are differentiated from area-serving industries. Indeed, the flow of goods and services and the flow of funds between industries and sectors and between the area economy and the rest of the world is capsuled in the interindustry transactions table around which the computable area economic model is constructed.

Twenty-three private industries and six public industries are identified in the area economic model. Data on the 23 private industries were prepared in accordance with established and accepted procedures of area input-output studies (7,74). Data on the purchases of the public industries were prepared, also, in accordance with these procedures. Data on the disposition of public industry output is confounded, however, by the lack of "markets" for most

public goods. Hence, the disposition of public industry output requires an expansion of the conventional interindustry transactions table into a system of product and income accounts for both the private and the public sectors.

The public sector microcosm of the expanded interindustry transactions table is represented by the sources of local government revenues and the purposes of local government expenditures. Of particular importance in this study are the water-related public outlays which are identified in the context of local government functions and structures in the study area. Project proposals of the West Minnesota Resource Conservation and Development Project Committee are tabulated simply to show the nature and magnitude of the area financing gaps in water resource development in West Minnesota.

Fiscal-Ecologic Accounts

The expanded interindustry transactions table is presented as a series of fiscal-ecologic accounts in this study. The preparation of these accounts makes possible the introduction of a group of public industries -- construction, utilities, retail trade, health, education and administration -- as a buyer and a producer of goods and services.

The financing of industry output is the key difference between the public and private sectors. Only by use of the expanded interindustry table is this key difference amenable to economic analysis. This study of area financing thus depended upon the preparation of a system of local fiscal accounts which introduced financing activities as key elements in the expanded system of private and public accounts.

Among the uses of the fiscal-ecologic accounts is the assessment of the balance-of-payments position of an area. Disagreement occurs about the net balance of current and capital accounts in the public and private sectors. Lagging areas generally experience a net outflow of capital (to profitable private investment opportunities outside the area). Lagging areas also may experience a net outflow of flows in the public sector (because of high income and state taxes and large public outlays for high technology goods, such as defense, which are not produced in the area).

For West Minnesota, a net capital outflow occurred in both the public and the private sections (see rows 42, 43 and 45 in table 27). The net inflow of \$24,636,000 of state monies was more than balanced by a net outflow of federal monies of \$34,107,000. In the private sector, the estimated net outflow was \$29,471,000. Thus, the total net outflow of these two sectors was \$39,942,000 in 1962. If the estimated 1967 rate were to continue to 1980, the net outflow would total more than \$500,000,000 or approximately \$2,000 per person. Additional job-creating investments of this magnitude would represent a change in the investment climate in this area.

Projected 1980 net capital outflows in the public and private sector are substantially larger (\$70,292,000 in total) than the estimated 1967 levels. Built into the projected 1980 fiscal accounts is, of course, the lack of significant change in new job-creating, private investment opportunities. Hence, because of increasing productivity per worker the larger aggregate output could result in larger capital outflows in 1980 as compared with 1967.

Resource Development Planning

Significant shifts in levels of public and private investment will require changes in current perceptions of private investment potential and the uses of public investment in state and regional economic development. Private investment opportunities are perceived as being more favorable in high growth areas. Rapid population expansion reduces adverse consequences of faulty decisions in the private sector. And public outlays are increased in response to the unimpeded and uncontrollable economic growth.

Regional growth policy that aims to restrict rapid population expansion in the metropolitan area by reallocating existing public investment incentives from the metropolitan area to selected nonmetropolitan areas would force changes in private investment decisions. In addition, positive efforts to use public investment for urban development in the new growth areas (e.g., West Minnesota) would be needed.

The preparation of an expanded technical capability for fiscal planning and development impact analysis thus supports some of the current thinking on redirecting population growth in Minnesota and the Upper Midwest. The expanded capability would provide a means of simulating alternative regional futures implied by alternative regional policy assumptions on economic growth and population distribution.

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