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ANALYZING ALTERNATIVES IN REGIONAL RESOURCE DEVELOPMENT

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ANALYZING ALTERNATIVES IN REGIONAL RESOURCE DEVELOPMENT*

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In Minnesota, a multi-county scale of resource planning and development is being established. Today, all of the 13 Minnesota planning regions have been or are being organized by multi-county Regional Commissions. A major concern of these commissions is planning for the development of critical social and environmental services, ranging from health care to water supply and wastewater treatment.

To help in developing and testing alternative approaches to regional resource planning, a multi-county study area was selected several years ago in West Minnesota. This area is part of a multi-area region which focuses on the Fargo-Moorhead SMSA (4,6,8).

The multi-area region of which the 14-county study area is a part forms an intermediate level in a regional development system. The largest of the three regions -- the Upper Midwest Region -- is roughly equivalent to the Ninth Federal Reserve District.^{1/}

Future patterns of resource development in Minnesota and the Upper Midwest can be influenced by public policy choices on future population distribution. The choices are typified by two contrasting settlement

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^{1/} The three geographical areas are delineated by Maki (8,9,10) and Ulrich and Maki (16).

alternatives. One alternative is a continuation of the historical trends in population redistribution from peripheral areas to the metropolitan core areas, particularly the Twin Cities Metropolitan Area (TCMA). The other alternative is illustrated by the emergence of one or more sub-regional growth poles to absorb part of the industry expansion and population growth which otherwise could occur in the TCMA. A Commission on Minnesota's Future was established by the State legislature in 1973 to consider these and other regional development alternatives.

Infrastructure Planning

Each of the regional development alternatives implies certain infrastructure requirements, including public facilities for municipal and industrial water supply, wastewater treatment, solid waste collection and disposal, flood control, land treatment and drainage, irrigation, recreation, power, and planning and development (see ref. 1,12,13,17). Each of the specified areas of infrastructure development is water-related in some degree at least. These nine areas, moreover, are of immediate concern to municipal, township and county government units and, especially, the West Minnesota Resource Conservation and Development Project Committee. This Committee, which includes representation from the Boards of Commissioners of seven of the 14 counties in the study area, prepared a work plan in 1972 where specified project proposals are identified. These proposals are summarized and presented in table 1 as an indication of some current priorities and concern in infrastructure planning.

A regional focus for the infrastructure planning is provided in the concept of a hierarchy of regions. The multi-county region is a primary level for planning and provision of essential social and environmental

Table 1. Natural resource-related projects proposed for funding, by West Minnesota Resource Conservation and Development Project Committee, 1972.^{1/}

| Item | Estimated cost | Assistance | F Y 1973 Budget (proposed) | | | | | | | | | |
|-----------------------------|----------------|------------|----------------------------|-------|----------------|----------------|---------|--------|-------|-------|-------|-------|
| | | | Annual | Total | Local | | Federal | | | | | |
| | | | | | Tech- nical | Finan- cial | Private | Public | State | D | Other | Total |
| | | | | | | | | | | | | |
| Function: 2/ (\$1,000) | | | | | | | | | | | | |
| Water supply | 0 | 1,485 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wastewater treatment | 932 | 9,600 | 0 | 21 | 451 | 2 | 15 | 7 | 457 | 3,729 | | |
| Solid waste disposal | 41 | 40 | 0 | 0 | 0 | 40 | 0 | 0 | 1 | 41 | | |
| Flood control | 5 | 1,318 | 0 | 14 | 0 | 0 | 0 | 4 | 1 | 5 | | |
| Land treatment and drainage | 451 | 9,266 | 41 | 154 | 38 | 118 | 40 | 225 | 30 | 451 | | |
| Irrigation | 136 | 10,778 | 0 | 3 | 31 | 0 | 38 | 4 | 63 | 136 | | |
| Recreation | 189 | 8,209 | 20 | 78 | 19 | 44 | 19 | 17 | 84 | 183 | | |
| Power | 10 | 510 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | | |
| Planning and development | 451 | 168,684 | 0 | 0 | 7 | 6 | 8 | 422 | 8 | 451 | | |
| Sponsor: 2/ | | | | | | | | | | | | |
| State | 1 | 213 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | | |
| County | 119 | 2,042 | 0 | 2 | 13 | 33 | 10 | 46 | 17 | 119 | | |
| Township | 38 | 5,030 | 0 | 0 | 30 | 0 | 5 | 1 | 2 | 38 | | |
| Municipal | 153 | 6,933 | 20 | 69 | 10 | 116 | 5 | 7 | 15 | 153 | | |
| Other local government | 266 | 17,211 | 40 | 41 | 44 | 33 | 12 | 126 | 51 | 266 | | |
| Community development group | 1,075 | 39,883 | 0 | 48 | 440 | 7 | 74 | 60 | 487 | 1,068 | | |
| Civic organization | 56 | 1,015 | 0 | 1 | 0 | 1 | 0 | 1 | 55 | 57 | | |
| Sports organization | 99 | 1,040 | 1 | 49 | 2 | 18 | 12 | 42 | 25 | 99 | | |
| Private industry | 408 | 136,523 | 0 | 0 | 7 | 2 | 1 | 396 | 2 | 408 | | |
| Priority: 2/ | | | | | | | | | | | | |
| 1 to 14 | 193 | 5,019 | 61 | 145 | 15 | 11 | 14 | 130 | 53 | 223 | | |
| Unspecified 3/ | 2,022 | 204,871 | 0 | 65 | 531 | 199 | 106 | 549 | 631 | 2,016 | | |
| TOTALS | 2,215 | 209,890 | 61 | 210 | 546 | 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, including a major planned new community (which was rejected by the State Legislature in 1973).

services which enhance the quality of life for local residents.^{2/} Included in the study area is one of the 13 Minnesota planning regions (covering 9 of the 14 counties). Within this region are two important subregional planning units, namely, watersheds and functional communities.

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

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

The Regional Commission provides the organizational umbrella for

^{2/} The grouping of multi-county regions into a larger 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 rather than the provision of social and environmental services.

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 potential for effective exercise of planning, police, taxing and spending powers which may be delegated to the 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 (5). 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, the community unit emerges as an appropriate geographical unit for area task force organization.

A regional planning thrust to the study occurs, also, in the delineation of the nine problem areas cited earlier. With reference to wastewater treatment, for example, data are available from the State Pollution Control Agency (PCA) reports which show that for a large majority of municipal service systems, rivers are the final place of disposal for both treated and untreated sewage. 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 2). The larger municipalities depend largely on secondary treatment. For most of the larger municipalities, the secondary facilities have been

Table 2. Total population and municipalities with specified status of wastewater treatment facilities and sewers, West Minnesota, 1970-71.

| Size class of mun- cipality | Level of wastewater treatment | | | Sewers were built before 1921 | Wastewater treatment facilities were built before 1946 | Total area ^{1/} |
|-----------------------------------|-------------------------------|--------------|-----------|-------------------------------------|--|-----------------------------|
| | Primary | Secondary | Tertiary | 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) |
| | | | | | | 42,130 (2) |
| | | | | | | 131,138 (119) |

^{1/} Total population in 119 municipalities of 14-county study area, 1970.

constructed since 1946 (although the first sewers for these municipalities were built before 1921). However, a substantial part of the population resides in municipalities which require additional improvements in existing sewers and treatment systems.

The State PCA is establishing a priority ranking system for the issuance of sewage facility construction permits under the National Pollutant Discharge Elimination System 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 TCMA 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 system is inevitable.

Resource Development

Given the severe fiscal constraints imposed on local governments in a lagging region, the continuing emphasis on efforts to expand a community's economic base is not surprising. Still lacking, however, is a technical capability for identifying linkages between a community's economic base and its fiscal condition as one important tool in areawide infrastructure planning. This study attempts to provide a framework for analyzing resource development alternatives in terms of their fiscal implications

for local governments. Again, water systems development is viewed as a constraint on urban expansion and regional growth (1). Strict compliance with federal and state environmental standards and a population (growth) criterion in public revenue sharing reduces viable development potentials in lagging regions. Thus, infrastructure planning and, even more so, financing of water systems development, become important policy instruments for redirecting urban growth within a sub-state (or multi-state) region.

Resource data

The Regional Commission is taken as the decision-making unit for areawide resource management. Both sectoral and spatial development issues are considered by the Commission. Among the sectoral issues are the infrastructure requirements listed earlier. Spatial issues pertain to the urbanization of the study area under each of the two regional settlement alternatives.

Sectoral development. A sectoral breakdown of an area economy is provided in a computable economic model which contains the critical economic relationships of the area -- internal and external (10). The public sectors are differentiated from the private sectors and area-building industries are differentiated from area-serving industries. Twenty-three private industries (class 1 accounts) and six public industries (class 2 accounts) are identified in the area economic model (table 3 and 4). Data on the 23 private industries were prepared in accordance with established and accepted procedures of area input-output studies. Data on the purchases of the public industries were prepared,

Table 3. 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 | 2 | 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 | 4871 | 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 cons. | 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 (indirect) | 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 4. Income receipts from specified sectors, by capital account class, West Minnesota, 1967.

| Sector | Sector number | Class 6 | Class 7 | Class 8 | Class 9 | Class 11 | Totals |
|------------------|------------------|------------|------------|------------|------------|-------------|-----------|
| (\$1,000) | | | | | | | |
| 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 | 8,460 |
| 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 |

also, in accordance with these procedures. Data on the disposition of public industry output are confounded, however, by the lack of "markets" for most public goods. Thus, 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.

For purposes of resource development planning in West Minnesota, two departures from traditional interindustry (input-output) studies are noted. First, the public economy, which is represented by a 6 industry breakdown of locally-provided public services, is treated like the 23 private industries only in terms of input purchases. A 10-sector institutional breakdown is included (i.e., Sectors 35-44), also, and additional detail is presented in the remaining eight (current, i.e., Sectors 30-34, and capital, i.e., Sectors 45-50) accounts.

A second departure from conventional area input-output studies is the inclusion of flow-of-funds data in the expanded interindustry transactions table. Preparation of the expanded table 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 depends upon the preparation of a system of local fiscal accounts which introduce financing activities as key elements in an 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, (see ref. 14). Lagging areas also may experience a net outflow of funds 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 sectors. The net inflow of \$24,636,000 of state monies was more than balanced by a net outflow of federal monies of \$54,107,000. Thus, the total net outflow of these two sectors was \$29,491,000 in 1967. If the estimated 1967 rate were to continue to 1980, the net outflow would total more than \$380,000,000 or approximately \$1,500 per person. Additional job-creating investments of this magnitude would represent a significant change in the investment climate in this area.

Projected 1980 net capital outflows in the public and private sector are substantially larger (\$34,143,000 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.

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 uncontrolled economic growth.

Spatial linkages. Resource development in the 14-county area is conditioned, also, by the spatial organization of industry and urban growth in the Upper Midwest. Because of distance from major urban centers, together with marginal agricultural activity, the area economic base has declined sharply relative to other areas. Dependence on a single basic industry, namely, agriculture, has contributed to community decline and below-average growth in residentiary activities. Only trade and service employment has increased significantly, primarily because of the growth of Fargo-Moorhead as a subregional metropolitan service center.

Besides the growth of a subregional center of roughly 100,000 population, the study area is affected by the influx of 40,000 summer residents. They come from the Twin Cities area and neighboring states to summer homes and resorts, typically on some lakeshore near a small trade center.

The expansion of manufacturing activity and the influx of summer residents is a familiar pattern in high-amenity rural areas outside the daily commuting zone of major metropolitan centers. The new activity impacts eventually add to the pressures of local government which lack resources to handle the emerging problems. In the study area, however,

the newly-organized Regional Commission has a potential role in areawide resource management that significantly enhances the alternative futures projected for the study area.

Spatial linkages are important in delineating the several levels of public planning in resource development. In the study area, three levels of public planning can be identified -- local, area and regional. While critical public financing gaps occur at the local level, success in reducing these gaps depends on mobilizing citizen support and improving the scale and quality of service enterprise management at the area level. Improving the long-run viability of the area's economic base depends on the implementation of growth pole and river basin strategies for urban-regional development. An activity location programming capability has been developed within the overall input-output framework as a computer simulation model (15). This model is being used in assessing public facility investment and location alternatives in the study area.

Performance evaluation

A technical capability for performance evaluation is needed, also, in the regional resource planning. The two categories of regional development accounts cited earlier -- the fiscal and the ecologic -- are a part of this technical capability.

In the fiscal accounts, local government revenues are identified by source and level of government (table 5). The fiscal accounts include, not only the indirect tax accounts, but also their linkages with other accounts. While the system of accounts may strike the layman as rather complicated, it really is not intended for popular consumption, but rather

Table 5. Local government revenues, by type of local government, West Minnesota, 1967(16)*

| Source | County | Muni- cipal | Town- ship | School districts | Special districts | Total |
|--------------------------------|--------|----------------|---------------|---------------------|----------------------|---------|
|thousands of dollars..... | | | | | | |
| Current local | | | | | | |
| Taxes | 11,443 | 4,423 | 1,590 | 15,898 | 35 | 33,389 |
| Charges | 548 | 1,641 | 0 | 1,337 | 122 | 3,658 |
| Other | 24 | 2,224 | 0 | 1,037 | 1 | 3,286 |
| Subtotal | 12,015 | 8,288 | 1,590 | 18,272 | 168 | 40,334 |
| Transfers | | | | | | |
| Federal | 157 | 41 | 0 | 0 | 19 | 217 |
| State | 15,776 | 910 | 160 | 21,208 | 0 | 38,054 |
| County | 0 | 179 | 102 | 2,424 | 11 | 2,716 |
| School district | 0 | 0 | 0 | 310 | 0 | 310 |
| Other | 0 | 9 | 0 | 0 | 0 | 9 |
| Subtotal | 15,933 | 1,140 | 262 | 23,942 | 30 | 41,306 |
| Borrowing | 640 | 2,470 | 20 | 5,598 | 33 | 8,762 |
| Net nonrevenue | 12,644 | 530 | 0 | 546 | 0 | 13,720 |
| Net fund withdrawal | 0 | 970 | 3 | 5,257 | 30 | 6,260 |
| Subtotal | 13,284 | 3,970 | 23 | 11,401 | 63 | 23,742 |
| Total | 41,232 | 13,398 | 1,875 | 53,615 | 261 | 110,382 |

* Sum of column rows may not equal area totals because of rounding.

as an organizing rationale for achieving accuracy and consistency in the data for resource development planning. A summary tabulation of local government revenue, as in table 5, is identified in table 3 as part of submatrix 5.4 (i.e., Sectors 35-44 and Sectors 31-34 in the overall matrix).

Local government expenditures also are identified in the fiscal accounts (table 6). In the summary matrix, the local expenditure data are part of Submatrix 4.5. The two data sets are also incorporated in the flow of funds summary presented earlier. Changes in demand or cost conditions facing industry or municipal service sectors, or in totally exogeneous conditions can be translated into corresponding changes in the local fiscal accounts. Thus, given the necessary technical capability, an area-wide impact analysis is feasible for the Regional Commission.

Like the fiscal accounts, the ecologic accounts provide data on natural resource inputs and waste emissions associated with each production and consumption subsector in the overall accounting system. Data on land and water inputs and waste emission of economic activities in West Minnesota generally are adapted from secondary sources (7.12.13). Local data sources are being tapped, however, to prepare additional detailed entries for non-industry submatrices of the expanded input-output model. For the most part, these submatrices treat the ecologic subsectors as exogeneous to the area economy.

Financing Strategies

Financing gaps exist, not only for municipal water and sewer facilities construction, but also for capital improvements in regional facilities. The first task in assessing financing alternatives is, therefore, the

Table 6. Total current and capital expenditures (net of local transfers) for specified functions, by type of local government, West Minnesota, 1967 (16)*

| Type of local government | General government | 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 | 0 | 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.

preparation of a set of regional development accounts.

Regional development accounts are transformed into regional development issues by a series of maps which show the time scheduling and location of proposed development projects. The project sponsors and others affected by a proposed capital improvements program are able to identify the specific time and place in which their interests are endangered, or reinforced, by the proposed development program.

Financing alternatives for resource development also are provided in the regional development accounts. These alternatives would include a combination of federal, state and local income sources and financing arrangements. Each government level, however, would exercise a particular bias in assessing the costs and benefits of alternate financing arrangements.

Federal

A federal bias is asserted in efforts to minimize financing costs to the federal treasury. These costs may be direct, or they may take into account estimated income tax earnings, or they may include some part of the total cost to borrowers. For example, given a total cost of \$12 billion (or an annual cost of \$1.2 billion over a 10-year period) for water and sewer facilities needed by rural communities, the least expensive financing plan calls for use of direct loans at a market interest rate of, say, 5½% (15). When income tax earnings are considered, however, the least expensive plan shifts to direct loans at a market interest rate of 8%. From the borrowers' viewpoint the least expensive plan would be grants only, but this plan would be one of the most expensive for the Federal government.

Similar decision criteria may apply in choosing among federal financing plans for other natural resource development activities. In flood control, land treatment and drainage, irrigation, recreation and energy production, however, the organizational and spatial scale of local development is more extensive than for municipal water and sewer and solid waste disposal. For these functions, the spillover effects of proposed development programs may justify additional state and federal commitments. The indirect effects on the federal treasury may result in additional tax receipts to cover part of the total program costs for the borrowers.

Local

Local financing plans, exclusive of federal revenues, depend mostly on revenue bonds which are amortized from special assessments and service charges. For some municipalities, property tax receipts supplement receipts from service charges, while in a few municipalities, excess receipts accrue which are transferred to other functions (16). For many small municipalities, however, capital outlays are severely limited by capital rationing simply because of the non-marketability of their revenue bonds.

Given the place bias of natural resource development, we may expect less dependence on federal sources and more dependence on local sources of income in the future for this form of public investment. Thus, special assessments, property taxes and services charges must assume a greater burden in supporting development functions which primarily enhance local property values.

Area

Financing alternatives are extended by areawide pooling of part of the local tax base. Thus, the Regional Commission may realize an important

function in its evaluation of the areawide consequences of resource development alternatives on both the local environment and the fiscal condition of local governments. Of concern to the Regional Commission are not only the direct development impacts, but also, the indirect and the induced impacts which require a period of years to work out their full implications for particular groups and communities within the planning area.

Finally, the Regional Commission has a responsibility for economy in areawide capital improvements. To achieve a less expensive set of public facilities for a given area population, criteria for determining a viable minimal (as well as maximal) size of municipality are needed. For some municipalities, the costs of environmental management are high, not because of too many, but too few people. Below a certain cut-off level, say in the range of 50 to 250 households, construction and operating costs may be excessive for local income sources. For these residents, there may be no support of local services inasmuch as the same services are provided more economically by other municipalities which have a larger population base. The high service charges may be motivation enough for individual households to relocate within the area. Relocation allowances may be needed, however, for the least mobile residents as a further public inducement to reduce the social costs of settlement within a particular planning region.

Each of the financing strategies can be described in terms of alternate series of regional fiscal accounts. The development implications of the alternative fiscal futures can be worked at (1) the multi-county level and (2) the local level by use of the technical capabilities prepared as part of this study.

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