DOCUMENT RESUME

ED 129 526 RC 009 489

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TITLE Socio-Cultural Factors and Energy Resource Development in Rural Areas in the West.
PUB DATE Aug 76
NOTE 39p.; Paper presented at the Annual Meetings of the Rural Sociological Society (New York, New York, August 1976)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Change Strategies; Cultural Factors; Demography; Energy; Environmental Influences; *Models; *Petroleum Industry; *Population Growth; *Rural Development; Rural Population; Social Change; Social Factors; *Social Influences; Social Problems; Social Services; Values
IDENTIFIERS *Quality of Life; *United States (Rocky Mountain West)

ABSTRACT

Drawing upon and synthesizing social and demographic data (1940-70) from 14 counties in the Rocky Mountain West which are currently facing extensive population growth as the result of large scale energy resource development, a preliminary model of potential sociocultural impact was developed. Including national energy needs and traditional economic considerations, the model incorporated sociocultural factors influencing development (cultural attitudes and values and demographic characteristics). The sociocultural impacts which were identified included the following three categories: (1) interpersonal, family, and community social problems such as increased crime, alcoholism, divorce, and suicide attempt rates; (2) growing pressures on public services such as schools, housing, health delivery, and law enforcement; and (3) impacts on the physical environment having quality of life implications. It was suggested that primary impacts would be directly related to population change; the current homogeneous populations would be most affected by population diversification; and mitigating strategies should include improved local planning and quality of life, guaranteed economic benefits (not to be exported), impact aid, and "back end" trust funds. (JC)

SOCIO-CULTURAL FACTORS AND ENERGY RESOURCE DEVELOPMENT IN RURAL AREAS IN THE WEST

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Prepared for presentation at the Annual Meetings of the Rural Sociological Society, New York City, August 1976.

ABSTRACT

As a result of large scale energy resource development, many basically rural areas of the Rocky Mountain West face extensive population growth during the next several years. Drawing upon data collected in several of these boom growth communities, a preliminary model of the socio-cultural impacts of such growth is developed. It is suggested that the primary socio-cultural impacts are a direct function of population change. However, because of the generally homogeneous character of the current population in the impact areas, the effects of population diversification are likely to be as critical as are those of population growth. In the model, three types of impact from growth and diversification are specified: (1) interpersonal, family, and community social problems; (2) social service delivery problems; and (3) impacts on the physical environment that have social or quality of life implications. The paper concludes with a discussion of potential strategies for mitigating some of the adverse impacts of boom growth.

SOCIO-CULTURAL FACTORS AND ENERGY RESOURCE DEVELOPMENT IN RURAL AREAS IN THE WEST

A growing number of rural areas in the Western portion of the United States are currently experiencing or are projected to experience major population growth associated with energy resource development. Sweetwater County in Wyoming, for example, has experienced an annual growth rate of almost 19 percent between 1970 and 1974, with the population increasing from 18,000 to 37,000 people. The population projections for 1984 for this county vary between 50,000 and 90,000. Similar rates of growth have been experienced in other Wyoming communities in Sweetwater and Campbell Counties and are projected for such areas as Big Horn and Rosebud Counties in Montana (coal mining and processing, including gasification), Mercer and Oliver Counties in North Dakota (coal), Sheridan County in Wyoming (coal), Rio Blanco County in Colorado (oil shale), Carbon and Emery Counties (coal), Uintah and Duchesne Counties (oil shale), and Wayne County (hydro-electric power), all in Utah. Other areas in Colorado, Wyoming, Montana, Utah, North and South Dakota, Idaho, Arizona, and New Mexico face potential growth of similar magnitude from the development of alunite, phosphate, oil, oil shale, tar sands, potash, coal, and geothermal and hydro-electric power.

To a greater extent than ever before, sociologists and other social scientists are engaged in the process of assessing current and projected impacts of these developments.[1] While social science involvement in assessing potential impacts has been mandated by the Environmental Policy Act of 1969, the development of a widely accepted methodology for such assessment has been relatively slow in developing.[2] Part of the problem results from the fact that in the past federal (as well as sometimes state and/or local) laws have tended to emphasize physical, biological, and economic impacts while ignoring

or de-emphasizing the social consequences. Where efforts have been made to assess social impacts, the emphasis has tended to be concentrated on short-run benefits and costs as opposed to longer range consequences, and indirect costs have frequently been either ignored or underestimated (Singh and Wilkinson, 1973).

Given the nature of present and potential future impacts in areas such as those identified above, the importance of the task facing social scientists becomes even more evident. This paper is developed as a first step in defining some of the parameters of the problem. We begin by briefly reviewing some of the social and demographic characteristics of the impact areas in order to set the stage for a discussion of the major socio-cultural variables that appear both to affect and be affected by large-scale energy resource development. We will conclude with a discussion of mitigating strategies that, while preliminary, should provide the basis for further discussion and refinement as additional social scientists become involved in social impact assessment efforts.[3]

CHARACTERISTICS OF POTENTIAL ENERGY DEVELOPMENT AREAS

Social impacts of energy development in sparsely populated areas will be determined in part by the historical background of those areas. For example, areas that have experienced little social change in the past, that have been largely isolated from the mainstream of the larger American society, and that are fairly homogeneous in terms of cultural, ethnic, and social characteristics of their populations are likely to be more severely impacted by growth and change. On the other hand, areas that are more heterogeneous and that have experienced and successfully adjusted to social change in the past will probably be better prepared to make adjustments to future change.[4]

The figures in Table 1 indicate that most of the areas that are projected to receive the brunt of the population growth associated with energy resource development in western states are of the former type. That is, many of them have experienced very little population growth during the past several decades and a majority of the counties show populations in 1970 that were smaller than was true three decades earlier. In fact, of the 14 counties listed in Table 1, only three have larger populations in 1970 than in 1940. These three counties all experienced energy-related growth in the late 1960's. Even for these three counties, then, the same pattern holds; the reversal of population trends simply started earlier here than in the other areas. Therefore, we are talking about actual reversals of long-term trends in most cases and greatly magnified growth patterns in the others.

Table 1 About Here

While some of the counties listed in Table 1 reflect ethnic diversity because of the location of Indian Reservations within their boundaries, even here the ethnic diversity is of a special character. Both Indians and whites living in such places as Rosebud and Big Horn Counties in Montana and in Uintah and Duchesne Counties in Utah exhibit what could generally be considered rural values, customs, and traditions. The ethnic heterogeneity that is present is not of the type that would prepare the area residents for the social change that potentially confronts them as a consequence of large-scale population growth.

When this historical pattern of slow or negative population growth and cultural homogeneity is combined with the already occurring and projected future growth rate, the critical nature of the potential social consequences becomes more apparent. Table 2 summarizes population projections for these

counties that are experiencing or are faced with one or another form of energy resource development. When different projections have been made, we have chosen to include both moderate and extensive development figures.

Table 2 About Here

The magnitude of projected growth varies from area to area. However, in almost all cases the annual percentage growth is of sufficient magnitude that it promises to severely challenge the ability of the affected communities to respond in an efficient and effective manner. In Sweetwater County, Wyoming, for example, the population increased by just over 400 people between 1960 and 1970. During the next four years it doubled, increasing by almost 18,500 persons. Low projections for the early 1980's indicate almost 20,000 more persons and high projections indicate a population increase of an additional 50,000 persons. Projected rates of growth to 1985 or 2000 are equally as high and frequently even higher in other Montana, Wyoming, and Utah counties.

SOCIO-CULTURAL VARIABLES IMPORTANT IN ENERGY RESOURCE DEVELOPMENT

From the growing number of social impact studies conducted in these rapid growth communities we are beginning to develop a more clear understanding of resultant socio-cultural consequences. However, it should be noted that socio-cultural variables must be considered throughout the process of decision-making concerning resource development rather than just at the outcome stage. That is, while our primary interest is in consequences, the initial decision concerning resource development and location is influenced by socio-cultural factors as well. Figure 1 presents an initial model that recognizes the input as well as the outcome nature of these variables.

Figure 1 About Here

Economic factors have traditionally been the most important in decisions concerning industry location and development. Tweeten (1974: 92-93) summarizes the large body of literature in this area by noting that the expansion of existing firms as well as the location of new industry is determined primarily by three factors: accessibility to markets, availability of inputs (raw materials and resources), and transportation facilities.[5] Concerning the first point, closeness to markets has frequently been decisive in determining industry location. This, of course, has been a prime factor in the tendency of industry to locate near large market centers rather than in more rural areas. On the other hand, industries requiring large amounts of bulky raw materials are more likely to locate near the source of these raw materials. In either case, industry has found it necessary to locate near adequate transportation facilities both in order to receive necessary resource inputs as well as to ship the finished product to the consuming market.

While our model recognizes the critical importance of these factors, it also suggests that social and cultural factors, though traditionally underemphasized, are important in determining industrial location. For example, the demographic characteristics of the local population have an important bearing on whether or not a labor force with the necessary age, educational, and related characteristics is available. Other things being equal, industry will locate where the more attractive labor force can be found. Local attitudes and values are also important. The traditional pattern in many rural areas has been one of trying to attract industry at all costs. A community characterized by such an orientation is likely to develop various incentives to attract industry including exemptions from local property taxes, provision of buildings or building sites at low or subsidized costs, and

favorable credit rates. Now we are observing a growing emphasis on the importance of retaining a community's rural character, of preserving its attractive natural environment, and so on. Therefore, preservationist-utilitarian orientations of the local population as well as other attitude patterns come to take on more importance.

A third set of factors in the model that is perhaps taking on ever-increasing importance, particularly in the area of energy resource development, grows out of national energy needs and policy. The stated national goal of attaining energy resource self-sufficiency, if ever seriously instituted, would have great significance in decision-making relating to energy resource development. For example, the extraction of oil from oil shale and tar sands is not economically feasible at present. However, national energy needs may make it more feasible in the future either by pricing oil high enough that it would be profitable to develop shale and tar sands or by providing subsidies or financial incentives of some other form.

The first half of the model suggests, then, that relevant social factors are important (in conjunction with traditional economic considerations and national energy needs and policy) in decisions relating to energy resource development. The primary concern in social impact analysis, however, is with what happens once that decision has been made. It is to these issues that we now turn.

SOCIO-CULTURAL OUTCOMES

Rapid population growth in small communities invariably creates significant difficulties for these communities as they attempt to deal with that growth. The model suggests that the social problems that may emerge are more than just a function of an increase in size. Concurrent with growth,

population diversification, especially in highly homogeneous areas, can contribute to serious adjustment difficulties. As noted earlier, many of the communities that face imminent growth have highly homogeneous populations. And, while not a great deal is yet known about the characteristics of the incoming population, it is likely to be more diverse than that presently in the area. The model proposes, then, that socio-cultural impacts emerging from large-scale energy resource development are primarily a function of population change. Impacts associated with growth can be viewed somewhat independently of impacts associated with diversification. In relatively small, highly homogeneous areas the two interact to compound the potentially deleterious socio-cultural consequences.

In the model, three types of impacts are identified: (1) interpersonal, family, and community social problems resulting from growth and diversification; (2) social service delivery problems; and (3) impacts on the physical environment that have social or quality of life implications. Each of these are discussed in more detail below.

Interpersonal, Family and Community Social Problems

Studies conducted in contemporary boom towns in Wyoming and Montana have consistently observed rapid increases in social problems affecting the individual, the family, and the larger community. In Rock Springs, Wyoming, Gilmore and Duff (1974) found that the mental health clinic caseload expanded ninefold during the period while the population was doubling. Other personal pathologies were reflected in rapidly increasing alcoholism rates and suicides and suicide attempts. In Gillette, Wyoming, Dr. ElDean Kohrs (1974), Clinical Director of the Central Wyoming Counseling Center, has noted that divorce, family tension, emotional damage, and alcoholism were the common fruits of rapid growth. Children were forced to attend school in double

shifts because of a lack of classrooms, jails became overcrowded, truancy and delinquency increased, drinking problems became more serious, and growing depression led to a rapidly accelerating suicide attempt rate.

Kohrs uses the term "Gillette Syndrome" to describe the family problems associated with the general breakdown of public services and lack of access to a reasonable set of amenities for living. He notes that often the wives of the workers spent the day fighting the wind and mud in mobile home parks with no grass, no yard, and no place for the children to play. The frustrations engendered from such a life style cause her to snap at her husband as he returns from a 16-hour shift. He, in turn, angrily leaves for the local bar where he can drink and trade stories with other husbands who have had similar experiences.

Rapidly increasing crime rates have often been noted. For example, in Rock Springs, Wyoming, the number of calls to the local police department increased from 8,000 to 36,000 while the population was doubling. Complaints to one local law enforcement agency increased 60 percent between 1972 and 1973 (High Country News, 1973). In Soda Springs, Idaho, the influx of a large construction force associated with the phosphate industry has had a noticeable impact on feelings of public safety. Many long-term residents interviewed in Soda Springs reported that they now lock their doors at night while they never used to do so (Lewis, Logan, and Albrecht, 1975). While this is largely an intangible factor, it is nevertheless an important one.

The development of fringe settlements because of inadequate housing in existing communities contributes to important community integration problems. In a survey of families living in Gillette, Wyoming, Doran, Duff, and Gilmore (1974) found that fringe dwellers were less integrated into the community, participated less in community activities, and were less satisfied with their

living conditions than were persons dwelling in town. Most of the fringe settlement dwellers lacked a clear sense of belonging or a sense of place. This, in turn, led to less willingness to become involved in community problems or to join with others in attempting to find their solution.

Additional support for this concern can be found in a survey of residents of Sweetwater County, Wyoming, by Bickert (1974). In discussing his survey findings, Bickert states:

> There is another problem confronting Sweetwater County--a problem which defies ready solution. That is the general malaise emanating from a number of factors, but principally arising from the lack of real commitment to the welfare of the community. Personal commitment and interest go hand-in-hand with a position of community establishment; e.g., long time residence, high income, white collar occupation. On the other hand, alienation--the perception of powerlessness in dealing with one's personal environment--is more apparent among newcomers, low income groups, and individuals with a great deal of previous residential mobility.

Bickert goes on to note that:

> The lack of commitment manifests itself in an unwillingness to become involved in community affairs and a disinterest in local politics. Newcomers perceive themselves as too removed from the power structure to change it. Old timers may have sought political involvement in the past, but frustration there and with recent community changes has implanted a 'what's the use?' attitude.

Bicker's survey found that a majority of the newcomers were sufficiently

dissatisfied with the community that they were threatening to leave unless some of the major quality of life problems were solved. The fact that boom growth is projected for many areas of the West makes such a threat more credible. With the projected demand for labor generated by energy resource development, skilled workers (and probably even many unskilled workers) may be able to "shop around" and find the areas or communities having the most appealing quality of life.[6] Those areas having less attractive living conditions will likely experience continuing high rates of turnover and continuing expressions of dissatisfaction that will be reflected in several of the problems noted above. Workers will stay for awhile and then move on to other areas where the demand for labor is equally high and the living conditions are more appealing.

Most of the social problems identified above seem to be compounded for the wives of the workers. When attractive quality housing is not available, the wife is the one most affected. Inadequate recreational and educational opportunities often impact more seriously on her than on the working father. And, too frequently, the wife (especially if the family resides in a fringe trailer settlement) confronts the most difficult time in being integrated into the existing community. The latter problem is compounded when there are significant cultural differences between the long-time community residents and the in-migrating labor force.

Most of the social problems that we have discussed above apply to the newcomer who comes with the employment boom. However, the changes that occur affect the long-time resident as well. For example, many of the traditional cultural and value characteristics of the long-term residents are threatened by an influx of workers with different life styles and value systems. In addition, Gilmore and Duff (1974) found that in Sweetwater

County, Wyoming, many of the old-time residents suffered from the boom financially rather than sharing in it. Housing and related costs increased rapidly as a function of demand. Long-time residents required to live on the same basic salary they had been receiving found it very difficult to pay the highly inflated prices. This, combined with the increasing crowding and congestion, increased competition for local services, higher crime rates, community conflict and disorganization, all contributed to important decreases in quality of life for such persons.

Social Service Needs

Negative impacts on quality of life, both for newcomers and for long-term residents, have been noted in boom growth communities because these communities have been unable to keep up with the increasing demands on public services. In fact, studies of rural industrialization generally have noted that the disadvantages associated with the attraction of industry to a small community are sometimes considerable (see Scott and Summers, 1974) because of service delivery problems that are created. Frequently, housing, health care, recreational and cultural opportunities, and educational facilities have lagged far behind the accelerating demands for these services. In their study of Sweetwater County, Wyoming, Gilmore and Duff (1974) found that there were approximately 5,000 mobile homes in the county by 1974 with a demand for 1,400 more units of permanent housing. When additional permanent housing became available, it was often priced at an unattainable level for many of the workers. In Gillette, Wyoming, they found massive, unplanned mobile home parks and squatter colonies of trailers often lacking normal water and sanitation facilities.

Gray (1974: 4) has noted the incongruity of such conditions:

> The greatest irony. . .is that the workers are not poor, but their

> living conditions are often worse than those found in urban ghettos. . .These workers often move from one temporary village to another as a way of life; they permanently live in temporary housing. Since so-called temporary housing, such as trailer villages, is usually sub-standard, some of these workers never enjoy the amenities which most Americans with much smaller salaries enjoy.[7]

Rural areas have long experienced difficulties in attracting adequate medical services and facilities. This problem is seriously compounded in the boom growth communities. When an area that is already experiencing a physician shortage doubles its population in a two or three year period, resultant health service delivery problems are readily apparent. Gilmore and Duff (1974: 16) found that in 1970 Sweetwater County, Wyoming, had ten physicians with nine of them engaged in the direct delivery of services to patients. In 1974, the county still had ten physicians but the population had more than doubled. Thus, the ratio of physicians to population declined from one doctor for each 1,800 people in 1970 to one for each 3,700 people in 1974. That statewide average for Wyoming is approximately one to 1,100.

Because of the crowding and long waits associated with trying to see a physician, more and more persons have come to rely on hospital emergency room service. During the first quarter of 1974, the emergency room at the Rock Springs Hospital handled an average of 1,300 cases per month. A visit to the emergency room thus came to replace the traditional office call for many.

In addition to manpower shortages, health-care facilities in rural areas are often woefully inadequate and outdated. This has contributed to the inability of these areas to attract additional personnel in the past and

when the already inadequate facilities are caught in the crunch of rapid growth, the situation is not likely to improve.

Another public service area most immediately impacted by boom growth is the educational system. The rapid influx of construction workers that usually accompanies the beginning of a boom growth period often results in an expansion of the school-age population that quickly outgrows the facilities available to accommodate them. Stop-gap solutions have included turning other facilities into temporary school rooms and sending pupils to classes in double shifts. Neither is likely to contribute to high quality educational opportunities for the affected students.

Impacts are quickly felt in other areas as well. The growing population is often accompanied by an accelerating crime rate which means that additional law enforcement personnel and equipment are required. Fire protection becomes a problem as new subdivisions emerge and as fringe settlements develop outside the major communities. Greatly expanded recreational and cultural facilities are needed but are seldom available, and public assistance roles soon strain the available budgets and staff time.

The problems in public service delivery emerge primarily because the demands for these services increase more rapidly than does the tax base necessary to provide them. Long-term residents are usually unable to finance facilities for new residents, especially if these new residents are viewed as being rather transient construction workers. The result is serious strain on the fiscal viability of local governments.

Research on small municipalities experiencing rapid growth indicates that they usually experience serious problems raising operating revenues and financing public facilities. Permanent residents often bear the burden of increased indebtedness for the expanded municipal services and some research

indicates that post construction booms which are expected to cover the costs often do not materialize (Smith, Hogg, and Reagan, 1971).

The problem of meeting service needs is often compounded because local communities lack the trained leadership to provide the necessary direction and planning. Leaders of a slow growth or a no growth era have not confronted the types of problems that are engendered during a boom era. And, because of lack of integration into existing communities, newcomers may be disfranchised from the local political process. Either they are kept out of full participation intentionally or they may choose to withdraw from the political process because of their own negative attitudes toward the local community and their personal alienation resulting from dissatisfying living conditions. The leadership vacuum occurs at the same time that strong, informed leadership is most critical.

High rates of absenteeism and worker turnover noted earlier appear to be directly related to unattractive living conditions. Gilmore and Duff (1974: 20) suggest that in fairly remote areas where labor must be attracted and retained from elsewhere, quality of life and availability of services and amenities become critical factors of production. If lack of local amenities such as attractive housing and other facilities makes living conditions sufficiently unattractive, then absenteeism and worker turnover become production factors in the same sense as such traditional factors as investment capital, land and materials, and labor. This implies, they argue, that in isolated rural areas, the whole community must be developed rather than just the industrial sector.

As noted earlier, inadequate living conditions may be especially difficult to deal with when the income of the principle wage earner is commensurate with a far more pleasing life style. Thus, for many workers, immediate

gratification of needs replaces a pattern of deferred gratification. For others, the high wages are accumulated only until there is enough to move elsewhere. Industrial research has suggested that productivity is dependent on a large number of factors beyond the characteristics of the immediate job. These observations tend to support that notion.

Impacts on the Physical Environment

Rapid population growth also carries with it the potential of impacts on the physical environment that have social well-being and quality of life implications. Aesthetic values are often difficult to measure and the linkage between a physically attractive environment and an attractive quality of life has often been assumed but seldom measured. Nevertheless, some research is accumulating that indicates the importance of this area (see, for example, Andrews, et al., 1972; Lewis, Logan and Albrecht, 1975).

Research on factors affecting attitudes toward one's community by Lewis, Logan, and Albrecht (1975) has shown that rural residents usually value their ready access to the out-of-doors and to a pleasing outdoors environment. In this research, industrial development in the form of a large phosphate processing plant did affect public responses to the environment. The ready visibility of a large smoke stack and the air pollution that was associated with it was of concern to many of the residents. In effect, the decline in the attractiveness of the physical environment did seem to have important impacts on perceptions of life quality.

Many areas of the West that face boom growth will experience smoke pollution from large coal-burning electrical power facilities, physical disfigurement (if only temporary) of the natural environment from strip-mining, potential effects on vegetation and water quality, and so on. While more research is needed on the effects these changes will have on the social

quality of life, the research that has been done suggests that some important impacts must be anticipated.

MITIGATION OF ADVERSE IMPACTS

A range of adverse socio-cultural impacts that could be associated with population change resulting from large scale energy resource development have been discussed. While all of these imply deleterious effects on local quality of life, it should not be assumed that all of these problems are insurmountable. In this final section a discussion of mitigating strategies will be developed.[8] Several of the strategies are being tried in communities currently experiencing rapid growth. It is assumed that their application, where feasible, will help decrease the negative socio-cultural consequences that are identified above.

Creation of Effective Local Planning Institutions

Patterson (1974: 8) observed from his study of the response of Montana communities to rapid growth associated with coal development that "the need to create effective local institutions for planning and for the implementation of the resultant plans is the most basic service need which this survey has identified." The oft-noted hesitancy in the planning process in small communities cannot be blamed totally on the local leadership structure. Frequently local leaders are hampered in their efforts by uncertain signals received from the energy development companies and from Federal agencies. For example, the construction of new towns to house and service the incoming labor force is a decision that is largely outside local control, though it has critical implications for local planners and leaders.

Because of the magnitude of projected growth in many cases, the burden

cannot rest just with the impacted communities. As noted by Patterson (1974: 9):

> state and federal authorities have a large and necessary role to play in providing consulting services, technical assistance and probably grant aid as well, depending on how the tax structure is set up in each state and what special arrangements are made with the companies. With proper help, local government can hopefully be provided with the capacity to handle the forthcoming pressures effectively and efficiently.

Other local planning strategies also deserve some consideration. One of these is the more effective utilization of multi-county organizations and planning units. A traditional problem in many areas has been the fact that local counties and communities have seen themselves in a competitive or adversary rather than a cooperative relationship. Planning problems are often compounded by the fact that county and other jurisdictional boundaries separate the area needing planning and resources from the area experiencing the major increase in tax base that should provide them. For example, a coal gasification or oil shale processing plant may be built on one side of a county line with most of the employment force locating in a community on the other side of the line. Gilmore and Duff (1974) have noted that many of the problems in Sweetwater County, Wyoming, existed in a political and legislative environment typified by fragmented planning efforts and jurisdictional boundaries that often separated population centers requiring public services from sources of public revenues. Attitudes that hinder cooperative relations between affected units must change. The problems associated with rapid growth will usually not stop at community or county

boundaries. Therefore, it is requisite that close and cooperative ties be established and, in some instances, that alternative forms of local government be considered.

The experiences of Sweetwater County, Wyoming, also suggest another possibly effective aid to the planning process. As part of an effort to respond to the problems generated by the Sweetwater boom, the County Commission suggested the establishment of a County Priorities Board made up of representatives of the county, the primary impact communities, and industry. The board is designed to serve as a vehicle for communication between elected county and community officials, the citizenry, and industry. It would also identify problems generated by the boom, recommend priorities for the resolution of these problems, identify a role for industry in problem solution, and work toward long-range capability for managing growth in the county.

The advantages of such a board are obvious from this description. First, it can provide a mechanism for more open communication among the various parties involved. Too frequently in the past, rapid growth communities have been characterized by a general absence of open communication between those most involved: the elected community leaders are unaware of the plans of industry and of their needs, industrial leaders have not been sufficiently sympathetic to the needs of the community, and so on. Secondly, in addition to serving as an informational forum, such a board can become the basic planning unit to identify needs and strategies for response to these needs. Other advantages could probably also be identified. Certainly they are sufficient to justify consideration of this or a similar concept in other areas and communities currently experiencing or faced with boom-type growth.

The overall key to the above, as noted by Gilmore and Duff (1974) is growth management. Local, county, multi-county, and state leaders, along with representatives of industry and the private sector must all work together in identifying present needs, in anticipating future needs, and in responding in an efficient and effective manner to these needs. In some instances, the only viable option may be a conscious effort to limit the rate of growth. However, such a decision would emerge only after a careful evaluation of present and future capabilities to respond to the projected growth and its associated pressures on community services and facilities. At any rate, the best available information should be made available to and utilized by the relevant parties in their planning efforts. Decisions should become conscious and rational. As noted by others (Gilmore and Duff, 1974; Patterson, 1974), the conventional evolutionary processes of community development and decision making are not designed to cope with boom growth.

Overall Efforts to Improve Quality of Life

In order to induce workers and their families to move into an area characterized by rapid growth, and to keep them there once they have arrived, several things in addition to attractive wages are necessary. Throughout this paper we have discussed a number of these. All can probably be included under the general label of "quality of life". For newcomers, an appealing quality of life would probably include the availability and accessibility of various public services and amenities, including health and medical services, public safety and protection, educational opportunities for their children, adequate recreation and leisure time facilities and opportunities, and attractive housing. Living in a fringe trailer court settlement may be acceptable for a while but not for extended periods for families having young children. This is especially true when the principal wage earner is making

a salary that would provide more attractive living conditions in another area.

A "good" quality of life for newcomers probably also includes some degree of integration into the community with attendant access to participation in community affairs. The potential split between old-time residents and newcomers can clearly impact negatively on the life quality of both. Surveys have revealed that newcomers to boom communities, especially those living in fringe trailer settlements, are often characterized by high levels of alienation and apathy in regard to active involvement and participation in community affairs. Only by assisting the newcomer to truly become integrated into the community are communication barriers likely to be broken. Surveys have also shown that those most involved in community affairs and in actions that significantly affect their life and life opportunities are the least alienated (Bickert, 1974).

Every effort should be extended to improve communication and interaction between established community residents and the immigrants. Programs could be established through which newcomers could be identified and made aware of services and facilities that are available in the community such as shopping, recreation, religious and educational programs (Gilmore and Duff, 1974). In very rapid growth areas, the community may even consider providing a telephone referral service where newcomers could be given the latest information on housing, community programs, and so on. This concept could be combined with a HELP-LINE which could provide assistance in special problem cases. The HELP-LINE could provide an especially useful service given the oft-noted increase in drinking problems, attempted suicides, and family conflicts in boom communities. Day Care Centers or baby sitting referral services could also be established to aid the young mother and to

increase her opportunities for participation in community affairs and in leisure time activities.

Industry, as well as the communities involved, has an important stake in outcomes generated by a more attractive and appealing quality of life. Attractive wages may keep a worker for a while but the probability of his leaving will be greatly increased if his family is unable to find attractive living accommodations and if the community is otherwise unappealing and lacking in basic amenities and services. The need to create more attractive communities, then, must be viewed not only as a concern of the communities themselves but also as a responsibility of industry. And, as suggested below, the responsibility may be shared by extra-local levels of government as well.

Guaranteeing Local Sharing in Benefits Accruing From Growth

One thing that is critical if negative social consequences are not to totally overwhelm the positive consequences for the local population is strong efforts to assure that the people already in the area will share in the benefits accruing from the exploitation of local energy resources. In many ways we are now experiencing a form of domestic colonialism. Capitalist exploiters are developing vast energy resource deposits in what are basically rural areas of the country. The profits from such exploitation are usually exported from the area while many of the problems--such as environmental degradation and increased social pathologies--are left behind. This analogy takes on even more significance with the realization that the social costs of the depletion of the energy resource deposits will almost all be borne in the local area while the profits will, in large part, have already been exported.

While the attitudes of a majority of rural residents in the areas we

have discussed seem to favor industrialization and the exploitation of the available energy resources, every effort must be expended to guarantee that they get something in return. Will they exchange their small rural character and their energy resources for crowding and urban blight, or will they instead by guaranteed attractive planned communities having a greater range of services and facilities than they currently enjoy? The social consequences of growth in these areas need not be all negative. However, planning will have to be extended in order to accentuate the positive.

Provision of "Impact Aid"

More and more persons are coming to recognize the need of some form of "impact aid" to assist rural communities faced with large scale growth from energy resource development. The need for new services expands more rapidly than does the tax base. Older residents who are usually the major property owners are understandably resistant to an increase in the mill levy since such action places a major share of the burden of paying for expanded services on their shoulders. As a consequence, other sources of revenue must be sought. Federal or state programs of impact aid to affected areas may be the best strategy. Patterson (1974) has suggested that possibly the federal government should be willing to assume additional responsibility for the sharply increased costs for public services in communities where such sharp increases are a function of national energy policies. In the case of oil shale and coal where development of the resource is at least partially in response to a declared national policy of energy self-sufficiency, this would seem especially appropriate.[9] Federal aid could perhaps be made available until the expansion of the tax base is sufficient to meet the expanded demands. As Patterson (1974: 21) has noted: "I ost increases were modest, they could be absorbed against the prospect of fu e state and county tax

income, but, if the costs are as great as present projections suggest, the traditional methods of state and local finance will not be able to bear the short term burden without unreasonable sacrifice."

The problems associated with the lag-time between when new and expanded public services are needed and when an expanded tax base is available to meet some of these needs makes the concept of impact aid especially attractive. New schools are usually needed as soon as the construction force begins to arrive. However, increased local revenue from the new development is usually several months in the future. Even if one could argue for the justifiability of placing the larger tax burden on long-time community residents, state laws generally limit the size of the mill levy and the bonding capacity of towns and counties. Impact aid could be used to fill some of this gap until revenue from the expanded tax base is available.

The Establishment of Trust Funds for "Back End" Financing

In recent months there has been a growing realization that boom towns not only need money to meet front end costs (costs associated with the demand for new and expanded social services before the tax base is expanded to meet those demands) but that they also need to plan for the time when the boom has run its course and local resources to maintain services are no longer adequate. A Revenue and Taxation Committee of the Utah State Legislature is currently studying the possibility of local or state government trust funds that could be used to assist in reclamation or to stabilize prospective sharp declines in property taxes once an energy resource is depleted. County Commissioners in the state have urged a feasibility study on such trust funds because of their growing awareness that the local property tax base can fall as rapidly as it rises once an energy resource has been utilized. In such cases, a county government could find itself faced with supporting various

services and facilities that were added during boom years but for which there is no longer a sufficient tax base.

The idea is to set aside a certain amount of property tax revenue that may not be needed for current operations into a trust fund where the interest earnings could be used in later years to support county services and operations even after the tax base has dwindled. This concept of trust funds would require new state legislation in most cases because under most present state laws, local governments are not supposed to tax beyond budget needs. Such legislation would seem to offer a promising solution to possible problems associated with the termination of a boom-type industry.

CONCLUSIONS

An important role for the social scientist in social impact assessment has been mandated by federal law. In this paper we have attempted to identify and categorize a number of socio-cultural variables that enter into that assessment in one or another phase of the energy resource development picture. We have argued that while economic factors and national energy policy play major roles in decisions relative to energy resource development, socio-cultural factors cannot be ignored. This fact is perhaps underlined by the recent decision to scrap the highly controversial Kaiparowits power plant project in the Four Corners area of the Southwest. While economic considerations were important in this decision, so also was the widespread public clamor by environmentalists and other interest groups who were concerned about aesthetic and related consequences of the mammoth coal-burning plant. Such outcomes clearly mean that social variables will continue to be combined with economic factors and energy needs in influencing decisions of whether or not to develop a particular resource.

The major role for the sociologist, however, has been that of studying the outcomes of the development once a go-ahead decision has been made. We have suggested that socio-cultural outcomes are all related directly to population change. Some of these are a simple function of growth while others relate more directly to population diversification. The latter is especially important to energy development in rural areas of the west because of the highly homogeneous populations that inhabit most of the communities that face rapid growth.

Three major classes of outcomes associated with population change have been identified: (1) interpersonal, family, and community social problems such as increased crime, alcoholism, divorce, and suicide attempt rates; (2) growing pressures on public services such as schools, housing, health delivery, and law enforcement; and (3) impacts on the physical environment that have quality of life implications. Data from the impacted communities of Wyoming and Montana suggest that all of these things have occurred to one degree or another.

Because of the nature of the social impact assessment process, the role of the social scientist is no longer one of simply identifying and studying these outcomes. He is also being asked to develop strategies that would help to prevent or ameliorate their occurrence. While much work remains to be done, we have suggested that such mitigating strategies may include: improving local planning capabilities, improving local quality of life, guaranteeing that economic and related benefits are not all exported, providing impact aid to affected communities, and establishing "back-end" trust funds to meet service needs once the resource has run out.

This list is only a beginning. For the sociologist more interested in theory and basic research there is a need to more clearly conceptualize the

issues at hand and to relate them to the broader tradition of research in rural community industrialization and change. For those with more applied interests, the task of translating sociological research findings and other skills into a meaningful approach for aiding communities in their response to the change that is upon them is, indeed, a Herculean one.

Footnotes

1 Historically, rural sociologists have probably been more interested in the decline of rural communities than in their growth if only because the former was a much more common occurrence (see, for example, President's National Advisory Commission on Rural Poverty, 1967; Beale, 1974; Doeksen, Kuehn, and Schmidt, 1974; Adams, 1969; Fuguitt, 1971; Wilkinson, 1974; and Simon and Gagnon, 1967). Even where there is a literature on rural growth and industrialization it is not of a great deal of help in this instance because the magnitude of the growth that is occurring or will occur in the communities affected by energy development tends to be much greater than what has occurred before.

2 In recent months, numerous environmental impact statements have been produced and most of these have included socio-economic sections. The quality of these reports has tended to vary widely, however. Partly because of this problem a number of federal agencies, including the Bureau of Reclamation, the U.S. Forest Service, the National Park Service, and the Energy Research Development Administration have contracted with social scientists to develop handbooks to guide social impact assessment studies. It is anticipated that more consistent methodologies and standards for studying and evaluating social impacts will emerge from these efforts.

3 We realize that this paper may leave many readers relatively "unfulfilled" because it does not contain a great deal of theory. We would be the first to concur that there is a critical need for more systematic theory development in the area of social impact assessment. However, to this point, a large majority of the work done by social scientists is found in

Footnotes (Continued)

environmental impact statements which, by their very nature, tend to be highly atheoretical. Our hope is that more of this work will find its way into the literature where it can be reviewed and critiqued by professional colleagues. Only then is greater theoretical development and conceptual clarification likely to emerge.

4 This is not to suggest that heterogeneity per se eases adjustment to social change. Rather, heterogeneous communities are likely to be less severely impacted by something like the influx of a large diverse construction force than are homogeneous communities.

5 It should be emphasized that much of the energy-related growth in the West is tied directly to the development of extractive mineral industries which are more likely to locate at the source of the raw materials. Other factors are likely to become secondary to raw material source when there is a great need for a natural resource but relatively few available deposits.

6 Gilmore and Duff (1974) report annual turnover rates of between 35 and over 100 percent for some of the construction companies in the Rock Springs area. Mining productivity dropped by 25 to 40 percent in some cases because of absenteeism and high turnover rates.

7 This is not meant to imply that mobile home living is, by definition, inferior. Clearly, some segments of the population prefer living in mobile homes. However, in communities growing at the rates projected in Table 2, mobile home living is often inferior and some workers and their families are not even able to get mobile homes. Colstrip, Montana, among other areas, had a relatively large tent and camper city during phases of

Footnotes (Continued)

rapid growth because neither permanent nor mobile homes were available.

8 An identification of strategies for the mitigation of adverse impacts has become an important part of the environmental impact statement process. While it would be presumptuous to assume that we can give adequate coverage to this critical topic in the limited space available here, the importance of beginning a dialogue among sociologists on this topic seems to justify its inclusion.

9 Smith, Hogg, and Reagan (1971) have noted that development projects are often justified in terms of national or regional economies or needs and not in terms of specific local impacts. Given such extra-local emphasis, federal, state, and industry participation in meeting front-end costs seems only reasonable.

Table 1

1940-1970 Population Change in Counties to be Impacted by Energy Resource Development

	1940	1950	1960	1970	% Change 1940-1970
Colorado					
Rio Blanco	2,943	4,719	5,150	4,842	+65
Montana					
Big Horn	10,419	9,824	10,007	10,057	-3
Rosebud	6,477	6,570	6,187	6,032	-7
North Dakota					
Mercer	9,611	8,686	6,805	6,175	-36
Oliver	3,859	3,091	2,610	2,378	-38
Utah					
Beaver	5,014	4,856	4,331	3,800	-24
Carbon	18,459	24,901	21,135	15,647	-15
Duchesne	8,958	8,134	7,179	7,299	-19
Emery	7,072	6,304	5,546	5,137	-27
Uintah	9,898	10,300	11,582	12,684	+28
Wayne	2,394	2,205	1,728	1,483	-38
Wyoming					
Campbell	6,048	4,839	5,861	12,957	+114
Sheridan	19,255	20,185	18,989	17,852	-7
Sweetwater	19,407	22,017	17,920	18,391	-5

Table 2

Population Projections For Counties Currently Experiencing Energy Resource Development in the West

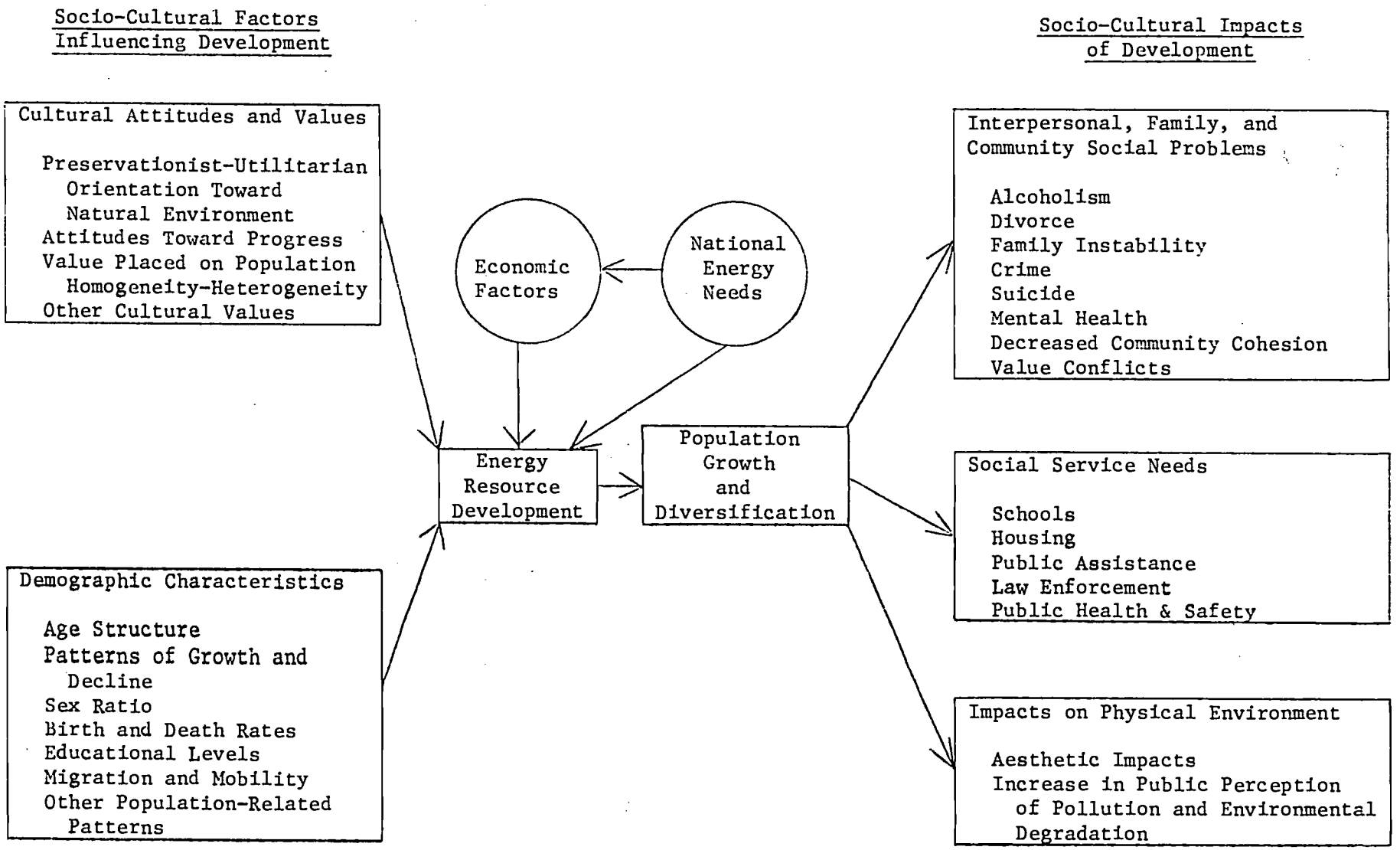
	1970	1985	2000		% Change 1970 - Full Operation of Projected Energy Development	
			Moderate Development	Extensive Development	Moderate Development	Extensive Development
Montana						
Big Horn[1]	10,057	13,900	19,500	36,800	+94	+266
Rosebud[1]	6,032	15,300	22,100	43,500	+266	+621
North Dakota						
Mercer[1]	6,175	14,200	24,400	54,700	+295	+786
Oliver[1]	2,322	3,500	5,100	7,200	+120	+210
Wyoming						
Campbell[1]	12,957	27,600	30,000	77,000	+132	+494
Sheridan[1]	17,852	32,900	42,600	64,000	+139	+259
Sweetwater[2]	18,391	Mod. 53,395 Ext. 88,875	----	----	+190	+383
Colorado						
Rio Blanco[3]	4,842	10,827	----	----	+124	
Utah						
Beaver[4]	3,800	10,766	----	----	+183	
Carbon[5]	15,647	32,600	----	----	+108	
Duchesne[3]	7,299	16,323	----	----	+124	
Emery[5]	5,137	18,700	----	----	+264	
Uintah[3]	12,684	28,372	----	----	+124	
Wayne[6]	1,483	13,347	----	----	+800	

Sources:

1 Patterson, 1974.
2 Gilmore and Duff, 1974.
3 Crawford, Fullerton, and Lewis, 1975.
4 Lewis, Albrecht, and Logan, 1974.
5 Center for Business and Economics Research, Brigham Young University.
6 Projections based on anticipated construction of the Intermountain Power Plant.

Figure 1

A Preliminary Model of Socio-Cultural Variables in Growth Associated With Energy Resource Development



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