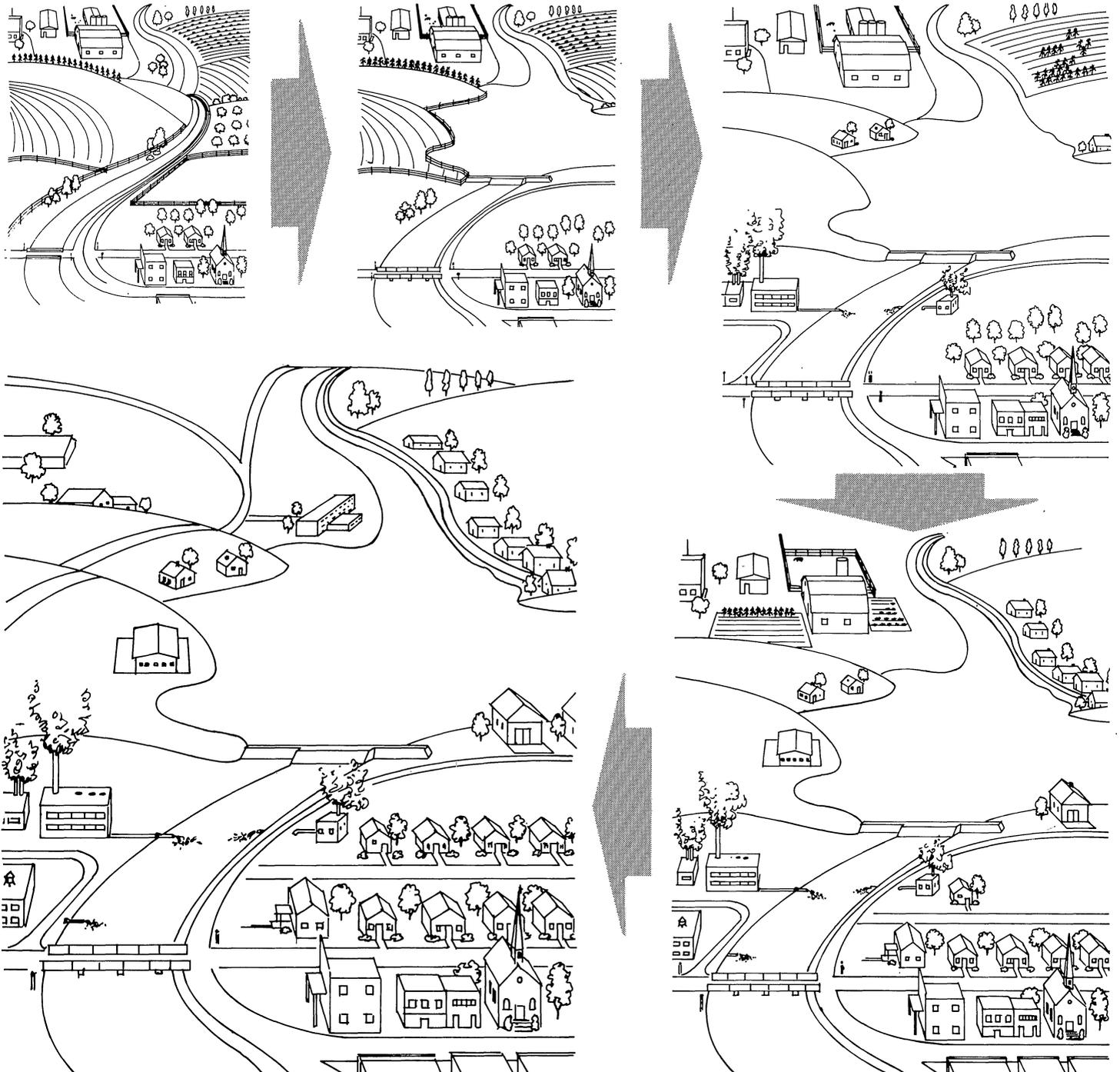


AN ANALYSIS OF THE SOCIAL IMPACT OF WATER RESOURCE DEVELOPMENT AND SUBSEQUENT FORCED RELOCATION OF POPULATION UPON RURAL COMMUNITY GROUPS: AN ATTITUDINAL STUDY

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CONTENTS

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Introduction.....	3
Collective Community Response to Forced Relocation of Population.....	3
Confrontation and Water Resource Development.....	4
Alienation: A Negative Response to Exogenous Change.....	5
Post Developmental Reconstruction of Groups.....	6
Factors Predictive of Community Alienation.....	6
Methodology.....	8
Instrument Construction.....	10
Analysis of Data.....	10
Findings and Discussion.....	10
Regression Findings.....	11
Path Analysis: A Test of a Model.....	12
Substantive Interpretation of Path Diagram 2.....	14
Summary and Discussion.....	14
Literature Cited.....	17
Appendix—Attitudinal Scales.....	18

An Analysis of the Social Impact of Water Resource Development and Subsequent Forced Relocation of Population Upon Rural Community Groups: An Attitudinal Study

TED L. NAPIER¹

INTRODUCTION

Water resource development in rural areas has been expanding rapidly in recent years and will undoubtedly continue into the future due to the ever increasing demand for high quality water sources from many sectors of society. While it is highly probable that more numerous water impoundment projects will be developed in the future, it is equally probable that much of the developmental activity will take place in rural or less densely populated areas. The rationale for this assertion is based upon the fact that fewer people in rural areas will be required to relocate their established homes as compared with more densely populated areas. Since it is highly probable that water impoundments will be located in rural areas and that the potential exists for significant disruption to occur among affected groups of people, impact studies of water resource development constitute an important research area for rural sociologists.

It is often assumed that water resource projects will result in more viable regional areas. Partial evidence for the validity of this assumption can be found in the primary and secondary developmental programs which have emerged from the Tennessee Valley Authority's regional projects. The argument that impoundment projects, if well planned, will result in an increase in the social and economic viability of the region probably has some merit. The regional benefits resulting from large-scale projects are often identifiable, but the effects upon directly affected community groups are not as evident.

Much of the research devoted to the evaluation of water resource impact has been focused on cost-benefit analyses, such as the numerous basin studies conducted by the U. S. Army Corps of Engineers (33, 34). These cost-benefit analyses in conjunction with geologic feasibility studies are essential to decision making relative to project justification, but other research areas exist which should be included in the decision-making process. The social cost of impoundment projects seldom receives more than cursory analysis.²

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Relatively little consideration is given to in-depth sociological evaluation of the project's impact upon directly affected groups. The basic intent of this bulletin is to report the results of a study which evaluates the perceptions of local residents toward their changed community. The stimulus for the change generating forces within the communities studied was the acquisition of several thousand acres of privately owned land for water impoundment projects and subsequent forced relocation of resident population.

To accomplish the specified goal of community evaluation of water resource developmental impacts, a research study was conducted within several communities in Ohio and West Virginia which had recently experienced extensive development activity. The primary objective of the research was to determine what attitudes the resident population held toward their changed and/or changing communities. A major component of the first objective was to determine whether or not social alienation tended to emerge among community members under stressful circumstances. A second major objective was to determine what factors were significant in the explanation of alienation which was hypothesized to occur in situations of collective community disruption of the magnitude investigated.

COLLECTIVE COMMUNITY RESPONSE TO FORCED RELOCATION OF POPULATION

Many research articles and bulletins have been written recently relative to the problems associated with watershed development. Wilkinson (36, 37), for example, in an exploratory study investigated public involvement in the initiation and implementation of watershed projects. He observed that structural factors of the community appeared to be associated with involvement and support of the projects among local people. Wilkinson's study suggests that local involvement in the decision-making process appears to have been a significant factor in understanding the group's response to the developmental program.

Gibbs and Loehman (14) have also provided insight into the evaluation of the impact of water re-

²In recent months, the federal developmental agencies have been subject to more rigorous norms requiring much more sociological analysis.

source projects. Their methodology and conceptual scheme are quite complex and admittedly in need of more specification, but the authors suggest that exogenous change, such as water resource development, affects many areas of a community group. The economic, social, and physical components of a community are affected in some way by water resource development.

Ludtke and Burdge (17) offer another perspective relative to the analysis of water resource developmental impact. They observed that pre-developmental (pre-relocation) anxiety was significantly related to people's willingness to sever social relationships with friends and their established homes. The authors conclude that if the goal is to minimize the disruptive effects of large scale impoundment projects, then "stress can be managed by planning a move that will minimize change." Such a contention would suggest that reduction of the negative impact of water resource development would be closely aligned to a minimization of the changes which take place within an affected community group. A very surprising finding from the Ludtke-Burdge study (6, 17) was that reduction of apprehension toward moving was not associated with the amount of information provided about the project. This would suggest that information dissemination within affected groups relative to the regional merits of the project is rather futile in resolving the anxiety problem and for soliciting support for the proposed project.

Peterson and Ross (24), in an analysis of community residents affected by water resource development, discovered that more positive attitudes toward the projects were identifiable after several years of program activity (developmental activity underway in the form of physical structures being built). The study revealed that the attitudes toward water conservation were highly positive, as were attitudes toward the project.

Numerous researchers (Dasgupta, 10; Smith, Hogg, and Reagan, 30; Selznick, 29; Webb and Bultena, 35; and many others) have analyzed water resource development impact and have observed some change-producing forces within affected community groups. Water resource development, like any other type of development activity, does not occur independent of other social institutions, but rather affects and is affected in return by the matrix of social variables within the locale of the project.

The purpose of this cursory overview of water resource research is not to provide the basis of a theory, but rather to demonstrate that watershed development has the potential of disrupting community groups. If one assumes that community groups have achieved some type of social equilibrium, then exo-

genous change in the form of water resource impoundment projects has a high probability of disrupting the functionality of the group. The theoretical underpinnings for such arguments may be found in Bertrand's (3) confrontation model.

CONFRONTATION AND WATER RESOURCE DEVELOPMENT

Bertrand (3) argues that the rural South has been and continues to be subject to change forces from the *mass society* (large scale, urban social influences). He argues convincingly that the rural residents of the South are being confronted on all sides by stimuli for change. He contends that the response to these change forces ranges from resistance to rather rapid acceptance and adoption of the changes. In the situation of resistance, the eventual product of the confrontation of the mass society and the rural South has been the gradual adoption of the mass societal behavioral patterns. From a structural perspective, this model would suggest that the local group confronted with change would initially resist the change, but through the process of accommodation would eventually accept the change.

The basic assumption of this research effort is that change will be resisted initially by the affected groups. Bertrand's argument that a group will resist exogenous change which is introduced into the group and necessitates extensive modification of the existing social order was basically assumed to be operative in the case of water resource development.

The exogenous change in the present study is in the form of the larger scale society, operating through developmental agencies, employing eminent domain norms to secure privately owned lands for the *common good* (public ownership). In the situation of water resource development, most impoundment projects frequently require that many acres be acquired and individuals within the basin area be relocated. The relocated population form a portion of the community group, and the displacement of this group should result in the disruption of the community group's equilibrium.³

Long-term residents may be required to relocate outside of the interactional boundary of the group (20). New membership (in-migrants) may join the group. Outside recreators and other visitors may bring differing values, norms, etc. into the group which has the potential of fragmenting the established social order of the group (15). New demands may be made upon existing services to the point that previously adequate services no longer meet the needs

³In very simple terms, equilibrium means that the group has established patterns of interaction and group functioning which meet their perceived needs.

of the group. In essence, the potential exists for severe modification of the existing socio-cultural environment of the group, which may not be perceived as being desirable, and the group subject to such changes may become displeased with the changes occurring within their community.

Even in the initial stages of project construction, the impact of the confrontation may be observed. Many construction companies bring work crews into the project area. These workers need housing and other services. Most rural communities will find it difficult to provide such short-term services. When services are provided, the long-run consequences for provision of adequate services (schools, housing, sewage facilities, etc.) may be quite negative for the local group. Smith, Hogg, and Reagan's (30) work demonstrated that one small community which experienced lake construction had to make service provision for construction workers. Once the *boom* was over, the services had to be maintained at the local group's expense (schools were financed from property taxes, for example).

This review of the confrontation model does not preclude the possibility that rural water resource development will result in an enhanced socio-cultural environment and make the community a much better place to live. The theory was posited by Bertrand (3), who notes that rapid acceptance is possible. The perspective employed for theory formation in this research, however, was in the direction of the negative orientation offered above. Consistent with this disruptive model, the major hypothesis for testing is that "water resource development will result in the emergence of negative attitudes toward the changed community."

ALIENATION: A NEGATIVE RESPONSE TO EXOGENOUS CHANGE

Alienation has received considerable attention in sociological literature. Seeman (28) and Blauner (5) have discussed alienation in the context of powerlessness, meaninglessness, social isolation, and self-estrangement concepts. Blauner's (5) classic work with industrial situations demonstrated that alienation tends to be highly associated with three basic phenomena: 1) the individual is powerless to control many of the factors affecting his life, 2) the roles which a person plays are not integrated and thus become fragmented, and 3) the individual becomes a social isolate to the extent he is a member of a social system but not integrated into the social relationships of the group.

When functional equilibrium exists within a group, it is argued that the probability is higher that each of these factors will be negated to some greater

or lesser degree. In stable social situations, the individual should have more control over his life and factors affecting it than in times of social disruption. The roles should be more integrated (even though they may not be the roles one would like to play). The probability should also be higher in stable social situations that people will become more integrated into the group. This is especially true in rural areas which have had traditionally longer periods of residential stability.

When exogenous change is introduced into a social system which has established some type of functional means of meeting the group's needs and disrupts the established interaction patterns within the group, the potential exists for alienation to emerge among affected group members. The disruptive stimulus for the communities under investigation consisted of land procurement by the state for the purpose of constructing large water impoundment projects. The state employed eminent domain norms to secure necessary properties from private owners. In this regard, the local residents were relatively powerless to negate the development activity which is consistent with most alienation definitions (powerless to control the forces which have potential negative effects).

Since land procurement for water resource projects often necessitates relocation of long-term residents, established interaction patterns within the group should become at least temporarily fragmented, which in turn should bring about some decrease in the social integration of the group. Since social integration should enhance feelings of mutual trust among community members, reduction of integration should result in a decrease in feelings of trust, thus resulting in increased social isolation of group members (another component of alienation). Mutual trust could be greatly decreased if group members believed that other land holders were being given advantages in the negotiation of contracts with the developmental agency (the truth of the beliefs are irrelevant since perception of a phenomenon would govern a person's reaction to it).

These factors and numerous others lead to the conclusion that exogenous change which disrupts community functioning has the potential of alienating resident populations from other group members and from the changes occurring within the group. Such exogenous stimuli as discussed above could also serve to create a feeling of powerlessness and self-depreciation due to the frustration associated with being unable to prevent a potentially negative activity from occurring.

In essence, the major theoretical position for testing is that exogenous change in the form of water resource development, which necessitates procure-

ment of extensive land acreage and relocation of resident population, will result in the emergence of alienation among affected people.

POST DEVELOPMENTAL RECONSTRUCTION OF GROUPS

Bertrand's (3) confrontation model offers useful insight into what should transpire within a group experiencing change once the initial stage of confrontation has passed. His theory suggests that in situations where initial resistance is encountered, the group will eventually modify the social system and acceptance of the change should follow. The components of the social system accommodate the changes and a new equilibrium is established.

In situations of community disruption due to water resource development, it is argued that reconstruction will occur once the dislocated people have resettled. Initial negativism toward the changing community and changed social relationships within the affected group should be reduced. Affected community groups should become stable social units once again and new patterned relationships should replace the unstructured ones. Restructuring of the community group, both long-term residents and recent in-migrants, should result in a reduction of community alienation for the group membership. The hypothesis for testing may be stated as follows:

Residents of communities which are in the initial stages of land procurement and relocation of resident population due to water resource development will exhibit significantly higher degrees of alienation from their community than residents of communities which have completed the resettlement and have reconstructed their interaction patterns.

FACTORS PREDICTIVE OF COMMUNITY ALIENATION

A test of the confrontation model was an important component of the research effort, but another significant goal was to determine the relative importance of selected independent variables in the explanation of alienation. If program planners are to be successful in resolving problems for groups affected by exogenous change, they must be cognizant of the factors predictive of alienation. Efforts could then be directed toward those individuals who would have the highest probability of becoming alienated from the changing situation.

Community alienation was denoted as the dependent variable. This variable was operationalized in terms of the concepts discussed in previous sections of this bulletin. Powerlessness, self-estrangement, mutual trust, and general perceptions of the community were employed in the development of the aliena-

tion construct. A person was deemed alienated if he did not trust the community leadership or other community residents, felt a lack of personal importance in his community, felt personally estranged from the community group, or held a negative perspective about the community in general. If the confrontation model has merit in understanding collective response to exogenous change, then it is hypothesized that community alienation will be high among directly affected groups.

The variables selected to explain attitudes toward the community (alienation) were: community satisfaction, community identification, familism, value orientation, physical mobility, and commitment to education. The theory⁴ was founded upon the work of numerous researchers' contributions: (Barresi and Lindquist (2), Cressey (9), Munch and Campbell (20), Andrews and Eshleman (1), and many others). A brief summary of the hypotheses for testing is presented below.

Community satisfaction was defined as basic satisfaction with the services and shopping facilities available in the local area. A person was satisfied if he perceived the services and shopping facilities to be basically adequate in meeting his/her needs. A person who perceives the services as providing for his/her needs should project this positive perception upon other components of the community, especially the social relationships. Therefore, it is posited that as community satisfaction increases, there is a concomitant decrease in alienation.

Community identification was defined as a feeling of group cohesiveness and mutual concern among group members. Personal estrangement should be reduced within a cohesive group since the individuals are members of a group as well as a social system. The individuals within the group should be less inclined toward powerlessness since collectivities tend to have some influence, even though it may be minor. It is hypothesized that as community identification increases, there will be a decrease in alienation.

Familism was operationalized in terms of frequency and intensity of family interaction. If a person was committed to close and frequent interaction with family members, he/she was said to be familistic. It was reasoned that individuals who were committed to primary-like interaction would tend to interact in a primary-like manner with others which would lead to integration (non-alienation). The hypothesis for testing was: as familism increases, there is a concomitant decrease in alienation.

⁴For an extensive review of the theory, see Napier, Ted L. 1971. *The Impact of Water Resource Development Upon Local Rural Communities: Adjustment Factors to Rapid Change*. Unpublished doctoral dissertation, Department of Sociology, The Ohio State University.

Value orientation may be defined as the shared conviction of a group relative to things the group members feel to be important (16). The major component of this variable was rapidity of change taking place within a group. A person was defined as being traditionalistic if he/she perceived that change was taking place too rapidly within the community. The variable was measuring commitment to the status quo. If a person is traditionalistic and rapid change is occurring, he/she should perceive the changes in a negative manner and become alienated from the changing situation. The hypothesis is that as traditionalism increases, there is a concomitant increase in alienation (the community has been and continues to be changed).

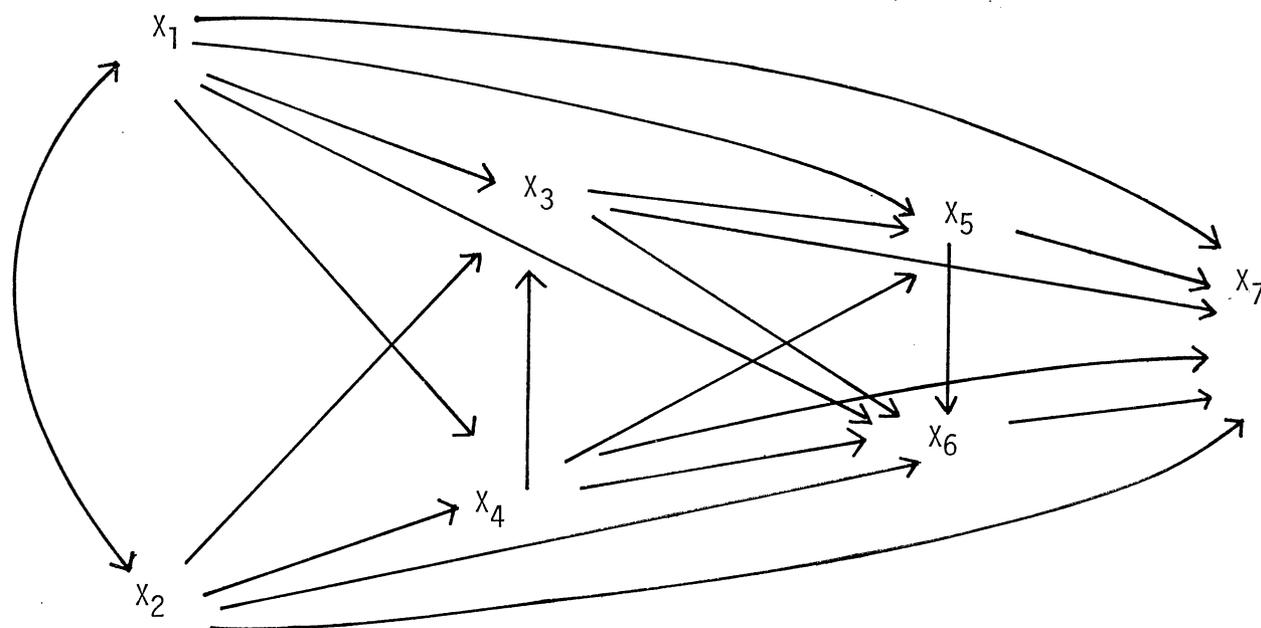
Physical mobility was defined and operationalized in terms of a desire to relocate outside of the community of residence. Persons would be defined as physically immobile if they did not wish to leave the community. A strong desire to leave a group should not be conducive for harmonious involvement with other group members nor strong integration. There-

fore, it is posited that as physical mobility (desire to leave the group) increases, alienation will increase.

Commitment to education was defined as the perceived importance of education as a means of achieving better life styles. It is argued that higher socio-economic status people will have the highest commitment to education and should therefore have more involvement with the community, both in formal and informal structure. The people with the highest commitment to education should have the lowest alienation.

The theory basically suggests that as community satisfaction, community identification, commitment to education, and familism increase, and as traditionalism and physical mobility decrease, there will be a tendency for alienation to decrease. The end product of theoretical modeling is presented in Figure 1. The interactive path model specifies how the independent variables relate to the dependent variable and how the independent variables relate to each other.

The model was developed using a time ordering



X₁ = familism

X₂ = value orientation

X₃ = physical mobility

X₄ = commitment to education

X₅ = community identification

X₆ = community satisfaction

X₇ = community alienation

Note: The arrows serve the purpose of showing the direction of the relationships of the variables in a time order sequence.

FIG. 1.—Path Diagram 1, Hypothesized Relationship of Selected Independent Variables and Alienation.

framework for placing the variables in a causal sequence.

It was reasoned that familistic and traditionalistic orientations were inculcated within the individual very early in the socialization process, and would therefore be first in the causal sequence. It should be noted in the model that no assumptions are made relative to the variables denoted as variables X_1 and X_2 . The model in Figure 1 reveals that X_4 probably precedes X_3 in time. In essence, a person would become committed to education early in life, but after familistic and traditionalistic orientations were developed. Physical mobility was posited to emerge, and then community identification and community satisfaction.

The path diagram in Figure 1 basically posits that all six independent variables will have a direct⁵ effect upon the dependent variable in terms of explaining the variance in alienation. The model, however, hypothesizes that several indirect relationships exist among the independent variables and alienation.

Inspection of the diagram reveals that all of the other independent variables are posited to be operating in some way through variable X_6 . Variables X_1 , X_2 , X_3 , and X_4 are hypothesized to operate directly or indirectly through X_5 . Variable X_3 is posited to act as an intervening variable between X_5 and X_6 for variables X_4 , X_2 , and X_1 , while variable X_4 acts as an intervening variable between X_5 and X_6 for variable X_1 and X_2 . There is no directionality of the relationship between X_1 and X_2 offered (no assumption made about the direction of the relationship).

In non-symbolic terms, the model states: 1) all independent variables will be significantly related to the dependent variable (X_7); 2) community satisfaction (X_6) will contribute to the explanation of community alienation (X_7) only; 3) community identification (X_5) will affect community alienation directly, but will contribute to the explanation of the variance in community satisfaction (X_6), which in turn will affect alienation (X_7) (indirect effect); 4) commitment to education (X_4) will be significantly related to alienation (X_7) on a direct basis, but will contribute to the explanation of physical mobility (X_3), community identification (X_5), and community satisfaction (X_6), which in turn will affect alienation; 5) physical mobility (X_3) will be significantly related to the dependent variable (X_7) and contribute to the explanation of variables (X_5) and (X_6), which

⁵The arrows in the diagram indicate the direction of the hypothesized relationship. An arrow from an independent variable to alienation without intervening variables connotes a direct effect, while an arrow from one independent variable to another with the second independent variable connected to the dependent variable connotes an indirect effect. An indirect effect in essence is the impact of a variable upon the dependent variable when it is operating through another factor (intervening variable).

in turn will affect the dependent variable (X_7); 6) value orientation (X_2) will be significantly related to alienation (X_7), but contribute to the explanation of physical mobility (X_3) and commitment to education (X_4), which in turn will affect alienation directly and indirectly through variables (X_5) and (X_6), and they in turn will affect the dependent variable (X_7); 7) familism (X_1) is posited to affect (X_7) directly, but contribute to the explanation of (X_3) and (X_4), which in turn will affect (X_7) directly and (X_5) and (X_6) indirectly, and they in turn will affect (X_7) directly; 8) no time ordering is posited between (X_1) and (X_2), even though a significant relationship is hypothesized to be present.

METHODOLOGY

Four communities which had experienced watershed development in the form of lake construction were selected for evaluation. Approximately 20% of each affected community group was required to be relocated, but most of the relocated people remained within the interactional boundary of the community (moved outside of lake basin and established new homes and farms). The data were collected during the spring and summer of 1970 when two of the affected community groups were in the initial stages of disruption, while two of the affected communities had been restructured. Two of the experimental groups were located in southwestern West Virginia and two in Ohio.

Two unaffected base groups were selected for comparative purposes. One of the unaffected base groups was located in Ohio and the other in West Virginia to control for possible subcultural (regional) variations. The base groups were selected on the basis of census data to ensure the greatest possible similarity with the experimental groups.

The sample characteristics revealed that the residents of the communities in question were white and middle-aged. The majority of the residents were engaged in some form of agriculture or blue collar occupations. Approximately half of the working members of the community samples were employed outside of their community of residence. A summary of the sample characteristics is in Table 1.

Two of the experimental groups (one in Ohio and one in West Virginia) were in the initial stages of land procurement for the projects (the term *stage 1* is used to denote the communities in the initial stages of disruption). The two remaining experimental groups (one in Ohio and one in West Virginia) were in the post developmental stages of reconstruction (relocation had been completed and the term *stage 2* is used to denote these groups). The rationale for this selection process was to test the confrontation

TABLE 1.—Summary of Socio-Economic Statistics for Selected Communities: Characteristics of Sample.

	\bar{X} Years			Ownership		Occupation		Income (\$1,000)				Employment	
	Age	Length of Residence	Education	Percent Own	Rent	Percent Blue Collar	Percent				Percent Work in Community	Percent Work Out of Community	
							Below 3	3-5	5-7.5	Over 15			
W. Va. Stage 1	46.16	21.88	10.12	92	8	72	Below 3 (19)	3-5 (16)	5-7.5 (30)	Over 15 (0)	48	52	
W. Va. Stage 2	46.58	19.29	9.05	75	25	74	Below 3 (37)	3-5 (29)	5-7.5 (19)	Over 15 (0)	50	50	
W. Va. Base Group	44.91	23.27	12.73	66	34	53	Below 3 (22)	3-5 (13)	5-7.5 (24)	Over 15 (11)	55	45	
Ohio Stage 1	43.42	15.36	12.65	80	20	68	Below 3 (3)	3-5 (13)	5-7.5 (20)	Over 15 (8)	49	51	
Ohio Stage 2	54.83	22.83	10.95	87	13	78	Below 3 (27)	3-5 (20)	5-7.5 (23)	Over 15 (5)	61	39	
Ohio Base Group	44.51	19.31	11.71	74	26	65	Below 3 (16)	3-5 (11)	5-7.5 (26)	Over 15 (6)	52	48	

model. It was posited earlier that groups which were in the initial stages of disruption would exhibit significantly more alienation than community groups which had begun reconstruction.

A systematic random sample (4) of adult members of selected families was taken from each community group.⁶ The interviewers were instructed to enter the designated community from different directions. The selection of the first occupied residence was made at random. Every fourth occupied dwelling was selected. If an interview was not granted at a selected residence, the adjacent dwelling was chosen and the original procedure continued upon the completion of an interview. The interviewers noted the location of each dwelling where an interview was granted on detailed county maps. This demonstrated that clustering of the samples did not occur.

This sampling procedure was employed in all groups with the exception of the stage 2 communities (people had resettled). The nonrelocated portions of the stage 2 groups were sampled by the systematic procedures described above, while the resettled groups were systematically sampled from lists of names and addresses provided by the development agencies.

⁶The geographical boundaries of the communities are rather arbitrary since the community groups in question were organized in an open country settlement pattern. Discussions with informed people in the areas, however, provided a means of delineating an interactional boundary.

TABLE 2.—Distribution of Sample Subjects by Community and Relocated and Nonrelocated Status.

	W. Va. Stage 1	W. Va. Stage 2	W. Va. Base	Ohio Stage 1	Ohio Stage 2	Ohio Base
Relocated	30	30		30	30	
Nonrelocated	30	34		30	30	
Base			46			50

Only those relocated persons who had resettled within the delineated boundaries of the community were included in the sampling procedure. A total of 340 interviews were taken in the study. The distribution of the sample is shown in Table 2.

The design employed in this research effort may best be conceptualized as a static group, post-test only control group quasi-experimental design (7). The observations were made after the stimulus was applied (either the land acquisition was in the initial stages or had been completed) within the experimental groups. The research design used may be conceptualized as follows:

	W. Va. Groups			Ohio Groups		
Stage 1	R	S	O	R	S	O
Stage 2	R	S	O	R	S	O
Base Groups	R		O	R		O

The "R" represents random selection of the sample, the "S" represents the stimulus under investigation, and the "O" the observations.

TABLE 3.—Internal Consistency Item Analysis Reliability Coefficients for Selected Attitudinal Scales.

Attitude Scale	Corrected Split-Half Correlation
Community Alienation	0.9100
Community Satisfaction	0.7934
Community Identification	0.8346
Familism	0.7153
Value Orientation	0.8203
Physical Mobility	0.8579
Commitment to Education	0.6920

INSTRUMENT CONSTRUCTION

The variables selected for consideration in this research effort were operationalized in terms of Likert-type attitudinal scales (12). Each of the constructs (variables) to be included in the study was carefully developed from the existing literature.⁷ Concepts deemed relevant to the formation of the constructs were employed in the initial development of tentative scale items. The tentative items were submitted to knowledgeable professionals for review relative to their validity and appropriateness. The scale items were reformulated and submitted to freshman students at The Ohio State University for pre-test purposes. The student responses to the scales were analyzed and reformulated to measure attitudes toward community groups. The scale items were presented to the subject populations and the responses were evaluated.

Given the manner in which the scales were constructed from existing research and theory, it is posited that construct validity is high for the scales. The reliability measure used was internal consistency item analysis using Cleaver's item analysis program

⁷The following research studies contributed to the development of the measuring instruments: Flinn (13), Rico-Velasco (26), Davies (11), Srole (32), Seeman (28), Miller (19), Phillips (25), Nettler (22), and Meir and Bell (18).

TABLE 4.—Range of Possible Scale Scores for Selected Attitudinal Scales.

Attitude Scale	Range of Possible Scale Scores			
Community Alienation	low alienation	21-105	high alienation	
Community Satisfaction	low satisfaction	6- 30	high satisfaction	
Community Identification	low identification	12- 60	high identification	
Familism	low familism	13- 65	high familism	
Value Orientation	modernistic	8- 40	traditionalistic	
Physical Mobility	mobile	9- 45	immobile	
Commitment to Education	high commitment	8- 40	low commitment	

(8). The responses from the community groups were submitted to item analysis and the results are presented in Table 3.

The relatively high corrected split-half values for the scales indicate they are reliable. Comparison of the coefficients with those from the student pre-test group demonstrated that the coefficients were basically reproduced, adding further support to the reliability of the measures. The scale items are presented in the Appendix.

The scale item scores were weighted and the values summed to form a composite scale score per respondent which was used for analysis purposes. The resulting scale scores were treated as internal level data for statistical purposes. The range of possible scale scores is presented in Table 4.

To ensure that community identification and alienation were independent measures, item analysis was conducted on the responses for both scales combined. The results indicated that the two scales did not *load* together, but were in fact separate measures.

ANALYSIS OF DATA

One-way analysis of variance techniques were employed to test the validity of the confrontation model as it was posited earlier. Since it was hypothesized that Stage 1 and Stage 2 community groups would differ from each other, analysis of variance techniques were deemed the most appropriate way of testing this position.

Step-wise regression analysis was used to determine the step-wise entry of the selected independent variables in the explanation of the variance in alienation. Interaction path analysis was used to test the path model presented in Figure 1.

FINDINGS AND DISCUSSION

The analysis of variance findings for community alienation are presented in Tables 5 and 6. One-way analysis of variance was conducted to test the hypothesis that groups in the initial stages of water resource development would exhibit the highest degree of alienation, and that alienation would tend to decrease when restructuring was completed. It was also hypothesized that the affected groups would exhibit more alienation than the base group.

The analysis of variance findings demonstrate that the hypotheses relative to the confrontation model as posited earlier were not supported. If one assumes that the identifiable differences are attributable to the stimulus of water resource development, then the theory is not applicable. The only community significantly different from the others was the West Virginia stage 2 community (t-tests were conducted for all possible combinations).

TABLE 5.—One-Way Analysis of Variance for Community Alienation, West Virginia Communities.

Groups	Stage 1 Community	Stage 2 Community	W. Va. Base	F-Ratio	Σ^2
Sample Size	60	64	46	7.3*	.09
Mean	44.6	52.4	46.2		
Standard Deviation	13.3	11.1	11.1		

*Significant at the .001 level with 2 and 167 degrees of freedom.

TABLE 6.—One-Way Analysis of Variance for Community Alienation, Ohio Communities.

Groups	Stage 1 Community	Stage 2 Community	Ohio Base	F-Ratio	Σ^2
Sample Size	60	60	50	1.0*	.01
Mean	48.7	46.7	49.1		
Standard Deviation	11.5	6.9	9.5		

*Not significant at the .05 level with 2 and 167 degrees of freedom.

The West Virginia stage 1 community group was not significantly different from the non-affected base group (determined by t-test for difference between means), which is contrary to the stated hypothesis. The stage 2 group was significantly different from the base group and the stage 1 group. No significant differences were noted among the Ohio groups.⁸

Inspection of the mean scale scores reveals that all community groups under study exhibited collective scores which were below the median possible scale score of 63 (lower scale values indicated that the respondents were not alienated). Even the stage 2

⁸For a detailed presentation of the alienation findings, see Napier (21).

community group in West Virginia exhibited more integration than alienation.

In terms of trends within the findings, few were observed. Where significant differences existed, they were not consistent with the stated hypotheses.

The author concludes that water resource development in the form of lake construction did not result in alienated populations as the construct was defined and operationalized in the research. Apparently the stimulus did not result in the disintegration of social relationships within the groups studied.

REGRESSION FINDINGS

A second goal of the research effort was to determine the relationship of selected independent variables with alienation. While the population under investigation tended to exhibit rather positive attitudes about their respective communities, considerable variation existed within the population in terms of degrees of non-alienation.

Since the analysis of variance revealed few differences among the various study groups, the data were aggregated for regression analysis.⁹ The step-wise regression analysis revealed that three variables explained approximately 63% of the variance in community alienation. The variables in order of entrance were: community identification (50% of the variance explained), community satisfaction (added about 11%), and physical mobility (added about 2%). The adjusted R-squared for the three-variable model was 0.6334, which means 63.34% of the variance in alienation was explained by the model. The remaining variables were insignificant in the reduction of the unexplained variance.

⁹Individual regression analyses were conducted for each community, but the results demonstrated significant similarity among the findings relative to variance explained and entrance of variables. This adds further support to the position that the aggregate analysis was justified.

TABLE 7.—Summary Statistics for Three Variable Regression Model: Community Identification, Community Satisfaction, and Physical Mobility (Alienation Dependent).

Regression Step	Variable Entering	Adjusted R ²	Beta Coefficients	F-Ratio (Total Regression)	F-Ratio (Variable Entering)
1	(X ₁) Community Identification	0.5028	(X ₁) — 0.7101	343.86*	343.86*
2	(X ₂) Community Satisfaction	0.6087	(X ₁) — 0.5939 (X ₂) — 0.3468	264.71†	92.49‡
3	(X ₃) Physical Mobility‡‡	0.6334	(X ₁) — 0.5053 (X ₂) — 0.3234 (X ₃) — 0.1880	196.21**	23.64††

*Significant at the .001 level with 1 and 338 degrees of freedom.

†Significant at the .001 level with 2 and 337 degrees of freedom.

‡Significant at the .001 level with 1 and 337 degrees of freedom.

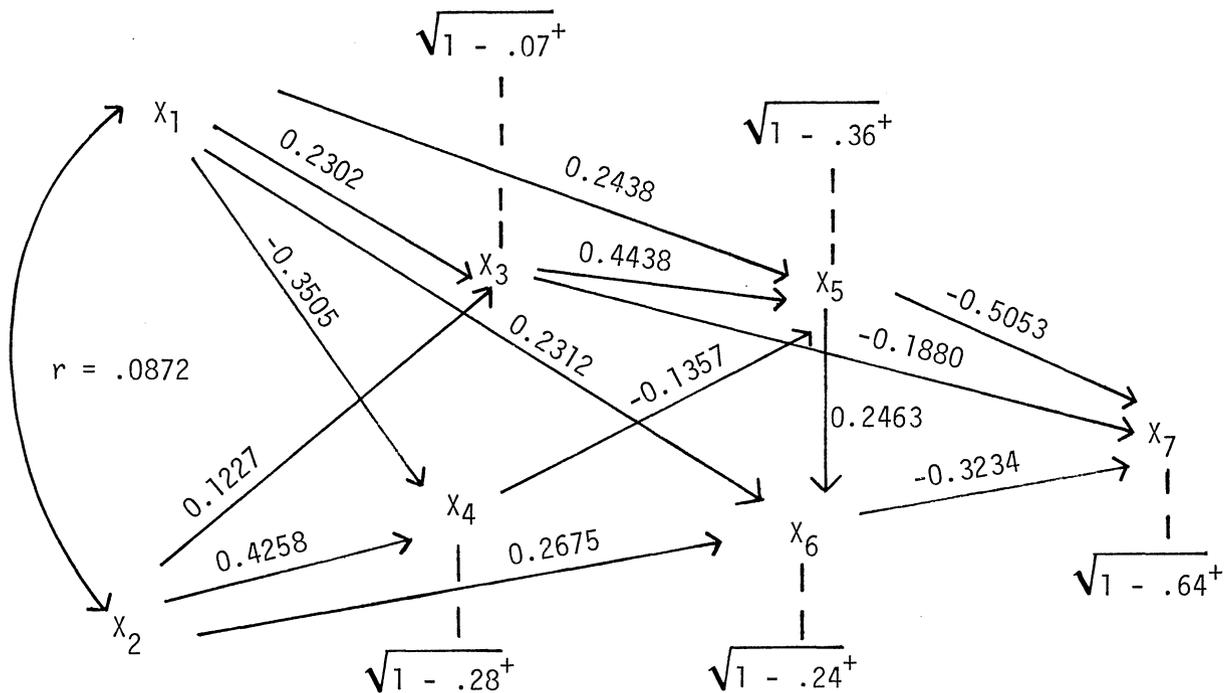
**Significant at the .001 level with 3 and 336 degrees of freedom.

††Significant at the .001 level with 1 and 336 degrees of freedom.

‡‡The variable was weighted in such a way as to make high values indicate immobility (see Table 4).

TABLE 8.—Actual (Original) Correlation Matrix for Selected Attitudinal Variables Below Diagonal and the Estimated Correlation Matrix for Selected Attitudinal Variable Presented Above Diagonal.

	(X ₁)	(X ₂)	(X ₃)	(X ₄)	(X ₅)	(X ₆)	(X ₇)
(X ₁) Familism	1.0	0.087	0.241	-0.313	0.393	0.351	-0.358
(X ₂) Value Orientation	0.0872	1.0	0.143	0.395	0.031	0.295	-0.138
(X ₃) Physical Immobility	0.2409	0.1428	1.0	-0.024	0.506	0.218	-0.514
(X ₄) Commitment to Education	-0.3134	0.3952	-0.0751	1.0	-0.223	-0.022	0.124
(X ₅) Community Identification	0.3932	-0.0073	0.5127	-0.2454	1.0	0.346	-0.712
(X ₆) Community Satisfaction	0.3514	0.2859	0.2822	-0.0199	0.3353	1.0	-0.539
(X ₇) Community Alienation	-0.3751	-0.1390	-0.5383	0.1304	-0.7101	-0.5459	1.0



X_1 (Familism) = e_1

X_2 (Values) = e_2

X_3 (Physical Immobility) = $0.2302X_1 + 0.1227X_2 + 0.9628e_3$

X_4 (Commitment to Education)* = $-0.3505X_1 + 0.4258X_2 + 0.0X_3 + 0.8596e_4$

X_5 (Community Identification) = $0.2438X_1 + 0.0X_2 + 0.4438X_3 - 0.1357X_4 + 0.8021e_5$

X_6 (Community Satisfaction) = $0.2312X_1 + 0.2675X_2 + 0.0X_3 + 0.0X_4 + 0.2463X_5 + 0.8716e_6$

X_7 (Community Alienation) = $0.0X_1 + 0.0X_2 - 0.1880X_3 + 0.0X_4 - 0.5053X_5 - 0.3234X_6 + 0.6029e_7$

*The weighting procedure used resulted in high values indicating low commitment (see Table 4).

+Residual paths.

FIG. 2.—Path Diagram 2, Revised Structural Path Model and Recursive Equations for the Model.

TABLE 9.—Differences Between Estimated and Actual (Original) Correlation Matrixes.

	(X ₁)	(X ₂)	(X ₃)	(X ₄)	(X ₅)	(X ₆)	(X ₇)
(X ₁) Familism	0.000						
(X ₂) Value Orientation	0.000	0.000					
(X ₃) Physical Immobility	0.000	0.000	0.000				
(X ₄) Commitment to Education	0.000	0.000	0.051	0.000			
(X ₅) Community Identification	0.000	0.038	—0.007	0.023	0.000		
(X ₆) Community Satisfaction	0.000	0.009	—0.064	—0.002	0.010	0.000	
(X ₇) Community Alienation	0.017	0.001	0.024	—0.007	—0.002	0.007	0.000

terion for evaluating the soundness of path models (27, 31). Since the expected correlations are so close to the actual correlations, the model in Figure 2 appears to be mathematically sound.

A zero order correlation coefficient was calculated between the actual and the expected correlations. The correlations in the actual matrix were treated as X values, while the corresponding correlations in the expected matrix were treated as Y values. The correlation between the two matrixes was 0.9983, which indicates the two matrixes were very close to exact. It is therefore concluded that the model is basically mathematically sound.

SUBSTANTIVE INTERPRETATION OF PATH DIAGRAM 2

The path analysis basically reproduced the regression findings in that community identification, community satisfaction, and physical mobility were the independent factors which had a direct effect upon alienation.

Community identification also had an indirect effect upon alienation through community satisfaction. While physical mobility had a direct effect upon alienation, it also appeared to have been operating indirectly through community identification. Commitment to education had no direct effect upon alienation, but was operating through community identification. Value orientation had no direct effect upon alienation, but was operating indirectly through physical mobility, community satisfaction, and commitment to education. Familism did not directly affect alienation, but was operating through several variables (community identification, physical mobility, commitment to education, and community satisfaction).

Individuals who were less alienated from their community tended to be more highly identified, more satisfied with their community services, and physically immobile (high scores indicate immobility). Individuals who were more satisfied with the services offered in this community tended to be more highly identified, more traditionalistic (value orientation),

and more familistic. Individuals, who tended to be more highly identified with the community tended to be more familistic, physically immobile, and more highly committed to education (high scores indicate low commitment). Individuals who were not committed to education tended to be less familistic and more traditionalistic. Individuals who tended to be physically immobile also tended to be more familistic and more traditionalistic.

SUMMARY AND DISCUSSION

The research findings basically repudiated the commonly held position that water resource development will result in an alienated population. The analysis of variance findings revealed that community development in the form of lake construction did not appreciably change people's perception of their community.

The West Virginia stage 2 community exhibited the highest degree of alienation, but inspection of the mean scores for the attitudinal scale reveals that even this group would not be considered alienated. Further probing into the situation which emerged after the land procurement phase of the project in the stage 2 West Virginia community revealed that another factor was operating. Discussion with numerous community residents revealed that labor problems emerged during the construction phase of the project. The local residents were expecting a major economic boom with local people employed during the project construction. This apparently did not materialize, since many of the construction workers were brought into the area by the construction firm. Friction emerged among affected group members, which tended to disrupt the community cohesiveness considerably since the community group began to align themselves with one faction or another (either pro or con construction group).

Perhaps the problem situations which emerged in the West Virginia stage 2 community (due to local residents having unfulfilled expectations about the benefits to be derived from the construction phase of watershed projects) should serve a beneficial purpose for developmental agencies. If expectations are

raised but achievement of the expectations is not realistic, then potential exists for frustration and negativism to emerge. Local informants indicated that local residents were led to believe (the source of the information that many jobs would be available was not identifiable) that many economic benefits would accrue to them during the construction stage, but this did not happen. Development agencies should be cognizant of this problem and inform the local people what the probable impact will be in terms of local employment during the construction phase of projects.

Because the West Virginia stage 2 group was the only community of those studied which experienced such labor problems, the deviance of this group from the other communities may be at least partially explained. It should be emphasized, however, that the mean scale score for the West Virginia stage 2 group was much lower than the median score of 63 (neutral attitude), which indicates that the collective group was not alienated.

The mean scores for the other affected groups were not significantly different from their respective nonaffected base group. This would lead to the conclusion that the affected community groups were not adversely affected by the developmental activity in terms of alienation from their communities.

Basically, the confrontation model did not appear to be appropriate in the present study. The stage 1 groups did not consistently exhibit more alienation from the other groups. The hypothesized patterns were not observed.

There are at least three reasons why the theoretical model of confrontation was inappropriate in this study. The first possible explanation may have been the selection of the dependent variable for analysis. While the author is confident of the validity and reliability of the instrument, it is possible that many unanticipated consequences of developmental projects such as those studied are not associated with the community situation and interpersonal relationships *per se*. In-depth conversations with several people in the affected communities revealed that uncertainties about the implementation of the projects, rapidity of payment for secured properties by the state, difficulty in locating housing and properties in the surrounding areas, inflated prices of property in neighboring areas, treatment by procurement agents, etc. were significant factors in their feelings about the projects. Often these were expressed in negative terms. The instrument was not apparently measuring these negative perceptions of the consequences of the developmental activity.

A second possible explanation for the collapse of the theory could be that water resource development does not have many negative consequences for af-

ected people. Therefore, the groups would not be expected to exhibit anything but positive attitudes. The author personally has some skepticism about this possibility. The in-depth conversations with numerous people in the affected areas (both relocated and nonrelocated), comments noted on the questionnaire in the open-ended section relative to the people's general attitudes toward the project, and numerous negative comments made by the respondents to the interviewers suggest that several negative consequences were operating in the communities being disrupted by the projects. It should be noted, however, that there were several positive or neutral comments, especially by the nonrelocated group who hoped for economic development in the form of recreation and land value increase.

The third possible reason for the failure of the theory is the research design itself. Perhaps longitudinal analysis of a particular community affected by lake construction is the only manner in which the theory could be tested. Again the author is skeptical. If some unusual findings had emerged which would have brought into question the comparability of the study groups before the development process (it is doubtful that exact comparability of study groups could be achieved unless the groups were taken from within the same community), then this possibility would have more merit for consideration.

In essence, the author suggests that community alienation, as operationalized in the research, was not evaluating the totality of the impact of the projects. Undoubtedly many secondary consequences which were not encompassed under the alienation variable should have been analyzed. One area which needs to be researched further is the impact of various types of implementation procedures used by development agencies upon affected groups.

The analysis of variance findings suggest that people within affected community groups tended to transfer their perceptions about the prior community (in terms of alienation as it was operationalized) to the restructured situation. On a collective basis, the perception of local residents did not change significantly. This, of course, assumes that the selected base groups were representative control groups which could be used for comparative purposes. These findings lead to the conclusion that watershed development and subsequent relocation of population had relatively little impact upon the degree of collective alienation within the affected communities.

The data from the total sample of 340 people were analyzed using stepwise regression analysis and interactive path analysis. These techniques were employed to determine the relative strength and relationship (linkage) of the independent variables in the

explanation of the variance in alienation. Community identification, community satisfaction, and physical mobility were significant in explaining 63% of the variance in the dependent variable. As community identification, community satisfaction, and physical immobility increased, there was a concomitant decrease in community alienation.

Development agencies which are concerned about the alienated people within the affected group could employ these study findings as a means of determining what people have the highest potential for alienation. Agencies which disrupt *normal* functioning of a group could serve a useful role in the enhancement of the community integration. They could use their developmental resources to help those people with the greatest probability of being alienated become integrated into the restructured group.

In summary, the findings were encouraging but somewhat inconclusive relative to the social impact of water resource development. The findings were encouraging in the sense that they demonstrated that wholesale alienation does not emerge as a result of watershed development and subsequent forced relocation of population. The study was inconclusive in the sense that open-ended responses to questions dealing with general attitudes to forced population revealed that many people held very negative attitudes toward community disruption because of land procurement for water resource development purposes.

Research needs to be initiated in such areas as structural changes within community groups affected by forced population relocation and land procurement. Other areas which need to be investigated are: longitudinal evaluations of community structure on a macro-level basis, evaluations of recreational development impact upon the groups associated with watershed development, changing land use patterns and land value shifts resulting from lake projects, income redistribution, and attitudes toward development projects *per se*. Numerous other areas of fruitful research also need to be explored.

Numerous secondary consequences were apparently not evaluated in terms of the dependent variable of this study, but insight was gained into those factors predictive of alienation. A good path model was developed which demonstrated the relationships among the variables. In this regard, the study was quite productive, but much research needs to be done before social scientists are able to conclusively say they know the relationship of factors associated with secondary impact of natural resource development.

One recommendation from the findings is that some provision must be made for the people to have the opportunity to remain within the interactional boundaries of the community without experiencing

economic loss. If community identification, which was the most significant variable (about 50% of the variance explained) in the explanation of alienation, is to be operative in reducing alienation, then the people must maintain some continuity in their group membership. The relocated people observed that inflated prices of comparable properties in surrounding areas caused them some economic problems which could easily be resolved with *severance pay*.

Perhaps severance pay could be established by agencies involved in watershed development to insure that relocated people have the option of remaining in the area with no financial loss. The subject groups in the present study clearly demonstrated that they intended to relocate or had already relocated in the portion of the community not subject to inundation. If provisions are made to insure that the relocated groups can secure properties in close proximity to their former homes and friends, then a potential negative aspect of forced relocation may be eliminated or at least tempered. To demand social sacrifice without some type of compensation has the potential for alienation and subsequent dissatisfaction with watershed development.

Severance pay could provide a mechanism through which group identification and solidarity could be maintained. The relocated portion of the community would not be forced to leave the area to find new homes and thus community relationships could be maintained.

If measures are enacted to ease the transitional period for the subject groups, then watershed development may become an increasingly effective means of rural development. New funds from *outside* sources have the potential of being brought into the area. Social and economic advantages from the resultant lake may be realized by local people, in addition to regional benefit.

Long-run benefits to the region and affected groups are assumed through flood control and increased quality and quantity of water, but short-run negative aspects of the development must be considered. The transitional period could be made easier for the subject group and assurances given that every effort will be made to provide the means and opportunity to relocate in close proximity to friends and relatives in the community. The period of uncertainty of project construction should be reduced and rapid payment should be made for procured lands.

With these steps, perhaps the short-run negative aspects of watershed development may be resolved. If the initial short-run problems of adjustment are resolved, water resource development may be perceived by many rural community groups as a significant mechanism for socio-economic growth.

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APPENDIX—ATTITUDINAL SCALES

Community Alienation Scale

Most leaders in this community are capable men.
I would associate with most people in this community.
I definitely like this community.
This community fulfills most of my needs.
Most of the leaders of this community are concerned about me.
Most of the people in this community cannot be trusted.
I feel fairly well adjusted to this community.
I feel fairly well satisfied with this community.
I am not important as a person in this community.
I would prefer to live in another community.
Most elected officials cannot be trusted.
I do not believe this community will prosper.
Most of the leaders of the community understand the problems of the people.
This community is a good place in which to live.
I am proud to be a member of this community.
The community does not provide for my needs very well.
Few of my neighbors are concerned about me as a person.
Few people in this community care what happens to the other members of the community.
I do not feel at home in this community.
Most people in this community work to make the community a better place to live.
Most of the leaders of this community respond to the needs of the community members.

Community Satisfaction Scale

Most people are not able to buy the things they need in the stores in this community.
We often have to go to surrounding towns to get the things we need.
The services of this community basically satisfy my needs.
Basically the services in this community are very poor.
Most people have to do without many services in this community.
I can get most of the things I need in this community or in the stores nearby.

Community Identification Scale

I know most people in this community quite well.
The people in this community are like one big happy family.
I am concerned about what happens to this community.
Most people in this community are friendly to my family.
When someone in the community is sick, I will stop what I am doing to help him.
I feel that I have never been a part of this community.
Many people in this community are unfriendly.
I take pride in the success of a neighbor.
When a neighbor needs help in a job, I am happy to lend him a hand.
I often share tools with my neighbors.
I do not feel that I am wanted in this community.
When someone leaves this neighborhood, nearly everyone feels a loss.

Familism Scale

I would rather visit with friends than with my relatives.
I take pride in the success of a close relative.
My personal business is of no concern to my relatives.
Most of the time, I do not want to be bothered by my relatives.
A person should live close to his relatives if possible.
Writing letters to family members is important to me.
Home is the most pleasant place in the world.
Family relationships have been stressed too much.
The family group is becoming less important to me over time.
A person should seldom visit his family.
What happens to my relatives is of little concern to me.
A good family life is necessary to be happy.
A person should be willing to sacrifice nearly anything for his family.

Value Orientation Scale

Most of the changes in this community have come too slowly.
What this community needs is more change.
Most old-fashioned ideas hold back progress.
Most people must give up the old ways of the past if this community is to progress.
Change is coming too fast in this community.
This community is changing too fast for me.
Most modern ways of doing things bring progress to the community.
Community progress is more important than living by the ways of the past.

Physical Mobility Scale

I do not ever wish to leave my present home.
I would find it difficult to feel at home in another community.
I would move if I could afford it.
When I move, I will move to another place in this community.
I do not want to leave this area.
I would like to move from this community.
I would enjoy moving to another state.
I would not move very far even if I could get a better job.
I would not want to move more than 25 miles from this community.

Commitment to Education Scale

Education is really not worth the effort.
Education beyond high school is a necessity for success.
Getting an education is the best way to get ahead in this world.
People should not be so concerned about improving themselves.
I would not be willing to take special training even if I could get a better job.
My children's occupation will probably be better than mine (or my husband's).
My children will have a better chance in life than I have had.
Education is not as important as most people think it is.

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Ohio's farm families benefit from the results of agricultural research translated into increased earnings and improved living conditions. So do the families of the thousands of workers employed in the firms making up the state's agribusiness complex.

But the greatest benefits of agricultural research flow to the millions of Ohio consumers. They enjoy the end products of agricultural science—the world's most wholesome and nutritious food, attractive lawns, beautiful ornamental plants, and hundreds of consumer products containing ingredients originating on the farm, in the greenhouse and nursery, or in the forest.

The Ohio Agricultural Experiment Station, as the Center was called for 83 years, was established at The Ohio State University, Columbus, in 1882. Ten years later, the Station was moved to its present location in Wayne County. In 1965, the Ohio General Assembly passed legislation changing the name to Ohio Agricultural Research and Development Center—a name which more accurately reflects the nature and scope of the Center's research program today.

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Center Headquarters, Wooster, Wayne County: 1953 acres

Eastern Ohio Resource Development Center, Caldwell, Noble County: 2053 acres

Green Springs Crops Research Unit, Green Springs, Sandusky County: 26 acres

Jackson Branch, Jackson, Jackson County: 344 acres

Mahoning County Farm, Canfield: 275 acres

Muck Crops Branch, Willard, Huron County: 15 acres

North Appalachian Experimental Watershed, Coshocton, Coshocton County: 1047 acres (Cooperative with Agricultural Research Service, U. S. Dept. of Agriculture)

North Central Branch, Vickery, Erie County: 335 acres

Northwestern Branch, Hoytville, Wood County: 247 acres

Pomerene Forest Laboratory, Coshocton County: 227 acres

Southern Branch, Ripley, Brown County: 275 acres

Western Branch, South Charleston, Clark County: 428 acres