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We are submitting herewith a dissertation written by Hussein H. Soliman entitled "Factors that Influence Family Response to Contamination of Water Resources: The Case of the Pigeon River." We have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Social Work.

Jane C. Kronick

Jane C. Kronick, Co-Major Professor

Sherry Cable

Sherry Cable, Co-Major Professor

We have read this dissertation
and recommend its acceptance:

Catherine Faver

Accepted for the Council:

Associate Vice Chancellor
and Dean of The Graduate School

FACTORS THAT INFLUENCE FAMILY RESPONSE TO CONTAMINATION OF WATER RESOURCES: THE CASE OF THE PIGEON RIVER

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Hussein H. Soliman

August, 1993

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DEDICATION

In memory of those who have lost their lives,
In honor of those who dedicated their lives
In memory of a river which was once living
but is now dead.
We students against pollution.

Bearden High School

*

Hereby dedicate this memorial.

October 27, 1990

* A few yards from the Pigeon River, in Hartford, Tennessee, children from Knoxville dedicated this memorial as a way of expressing their feelings toward the condition of the river and the residents of Cocke County.

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ABSTRACT

This study explores factors that affect differences in family reactions to a major threat of exposure to toxic substances in the environment. The problem of exposure to toxic waste is increasing in this country and world wide. Early studies have revealed a high risk for the communities and families. Exposure to toxic waste leads to medical, economic, social, and psychological problems. Protection from environmental hazards is a new role that the contemporary family must now play. Increasing instances of death, disability, loss of income, birth defects, and loss of property from environmental contamination have intensified the importance of family reactions to such threats. Families must participate in protests in order to defend their well being.

The question addressed in this research is: what determines whether or not a family chooses to play this new familial role? This raises theoretical questions regarding how and under what conditions a family changes its pattern of functioning. A study model is developed to determine the relationships between the dependent variable, family response, and the independent variables: 1) environmental awareness; 2) family relationships; 3) level of stress; 4) risk perception; 5) perception of community; 6) SES; and 7) perception of social support.

This study focusses on family response to the 85 year pollution of the Pigeon River by the Champion Paper Co. Residents of Cocke County, Tennessee have suffered from the consequences of the pollution for generations. In this study the family is the unit of analysis. Both extensive participant observation and a structured survey are used to collect data measuring various impacts of the pollution.

Findings indicate multiple social, economical, and psychological impacts on the families of Cocke County. Factors determining family response are level of education, stress, risk perception, environmental awareness and social support. Most families in the community believe that

the pollution of the Pigeon River represents a health threat to the community.

By engaging in political activism in protest of the pollution, activist families have adopted a positive coping strategy. Non-activist families vary in their reasons for non-involvement. Fatalism, scarce resources and the lack of clear perception of contamination impede these families' mobilization. Finally, for a community that has been suffering the consequences of the pollution for 85 years, social activism represents the most effective strategy for creating the public pressure necessary to force a solution to the pollution problem.

Names of participants have been changed to protect their rights.

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CHAPTER I

INTRODUCTION

The problem of exposure to toxic waste is increasing in this country and worldwide. Massive increases in the use of chemicals in industry have provided new products for the market; however, such use has created other critical problems. Industries that utilize chemical substances in production processes have typically tried dispose of byproducts in the cheapest ways possible by dumping materials into landfills, air, or water. Concurrent increases in instances of death, disability, birth defects and property loss have emphasized the importance of family reactions to environmental threats. Exposure to toxic waste leads to medical, economic, social and psychological consequences. Protection from environmental hazards is one of the new roles that a contemporary family must play.

The available research on technical environmental disasters indicates an increase in the rate of incidents of toxic exposure resulting from industrial discharge of harmful materials. The latest inventory, released by the Environmental Protection Agency in mid-1990, disclosed toxic discharges totaling 4.5 billion pounds in 1988- about 20 pounds per person in the United States. According to Rosenbaum (1991), these discharges included:

-360 million pounds into streams and other surface waters;

-1.22 billion pounds into underground wells;

-560 million pounds into landfill;

-2.4 billion pounds into the air;

-1.7 billion pounds sent to municipal treatment plants

Various types of public health hazards are generated by toxic waste. Epstein et al., (1982) indicate that some wastes are flammable, prone to ignite or explode with great ease or great force. Others such as acids and bases, are corrosive; they possess the ability to eat or wear away

materials through chemical actions. Some wastes are toxic because they contain disease-bearing organisms. The major category of concern about public health hazards is chemicals that induce specific types of chronic and irreversible effects, such as genetic damage, birth defects and cancer.

Risk to the general public from toxic wastes has become an important issue. The general public is exposed in daily life to trace quantities of many hazardous wastes. However, some people are also exposed to much heavier concentrations of one or more hazardous wastes. People living in proximity to hazardous waste disposal sites are described as a high risk group. There is an explicit agreement among researchers that the recent increases in the incidence of cancer are due to industrial pollutants (Epstein, 1978).

Studies find a consistent relationship among poverty, discrimination and environmental hazards (Rogge, 1993). Such a relationship indicates that communities suffering the consequences of toxic waste tend to be the underdeveloped areas which are generally characterized by low socioeconomic, high unemployment, high school drop-out rates and other social problems such as widespread dependency on governmental social programs. The argument calls for the understanding of the social, political, and economic dynamics that pertain to the problem of environmental hazards.

To examine the impact of environmental contamination in general and toxic wastes in particular, a number of case studies have been reviewed (Brown and Mikkelsen 1990; Epstein, 1978). These cases document the risk factors of contamination of natural resources such as air, water, and food. Statistical approaches were employed in these cases to quantify the sharp increases in water contamination, the number of children born with leukemia, and the alarming increase in cancer cases.

Brown and Mikkelsen conclude in their study:

1. Toxic waste contamination is disturbingly prevalent in the country

and throughout the world.

2. The corporate motive and government's implicit or explicit support of that motive have caused the toxic waste crisis and seriously hamper remedial action.
3. Toxic contamination produces extensive adverse health effects, both physical and mental. (1990: p. 3)

Brown and Mikkelsen's findings indicate that profit has caused the expansion of production that has led to the speedy deterioration of the environment. The same findings provide evidence of the government's role in enhancing and encouraging industry instead of protecting the public health.

The occurrence of environmental disasters has encouraged a number of scientists to evaluate the impact of such disasters on the individual, the family, and the community (Erikson, 1976; Levine, 1982). This type of environmental study is the focus of the disaster literature. These studies evaluate the psychosocial, economic, and health effects of environmental disasters evaluated in order to assess the magnitude of such effects on the people's lives.

A review of the literature indicates that technical environmental disasters occur with some regularity and the consequences of such disasters are sometimes far beyond any society's ability to contain them. The number of incidents of nuclear accidents alone has led some researchers to discuss the ethical problems raised by nuclear technology.

Shrader-Frechette (1984) believes that, because there is a chance of exposure to radioactivity, it is important to us as a people to make some well-thought-out choices regarding the risk-benefit tradeoffs of nuclear technology. She challenges the premise that the economic and technological benefits gained by permitting some radioactivity to be dispersed in the environment are worth an increase in cancer and genetic damage. Shrader Frechette argues that if policy makers consider that tradeoff a moral one, it is clear that such a policy is guided by a principle of

maximizing the greatest amount of good for the greatest number of people, rather than guaranteeing equal justice for all.

Because environmental accidents happen, the issue of personal injury is examined in an important study. Gaskins (1989) states that the United States remains the only country in the world where the judicial system dominates public perceptions of personal injury. "We still view accidents as essentially legal events, defined by doctrines, institutions, and professional perspectives of the law" (Gaskins, 1989). The author introduces a social/environmental definition of accidents to replace the outworn legal definition: "Borrowing from the research practice of epidemiology, we define an environmental accident as any personal injury whose incidence is statistically linked to the presence of one or more environmental factors" (Gaskins, 1989 p. 50). The significance of this definition is in its tendency to expand public awareness of the potential scope for personal compensation and environmental regulation.

A number of studies have examined the importance of environmental policy that could identify the principles, philosophy and ideological views of the relationship between individuals and the environment and specify the role of the government in such process. Mann (1981) stated that the formulation of environmental policy is a complex process reflecting the influence of multiple actors, existing social conditions, conceptual paradigms, estimates of the resources available and perceived cost and benefits of proposed courses of action. Mann believes that the political and economic structure of society clearly have had an impact on environmental policy making. This view necessitates a broad understanding of factors that determine the formulation of environmental policy.

Kronick et al., (1987) examine the assumptions and principles informing policy regarding hazardous and radioactive wastes. The authors assume that principles guiding preferences do exist that lead to decisions in the area of policy for environmental hazards. However, the

preferences yield decisions that are often inadequate to the problem of toxic waste. Instead of the development of a national environmental policy, a number of acts have been issued to state the rules and regulations in some specific areas. The development of the Superfund Act and the Nuclear Waste Policy Act provide federal responsibility in an area in which government at all levels had denied any clear responsibility.

Rosenbaum (1991) believes that no simple explanation for the nation's continuing environmental problems will suffice. Most ecological ills are the product of several factors in different and often interacting combinations. This view argues that relying on a number of laws to resolve the environmental problems is inadequate policy. "While practically every important ill has been targeted by a major law, delay and difficulty in program implementation routinely impede enforcement" (Rosenbaum, 1991, p. 33). He argues that implementation is frequently frustrated by decades of deficient agency staffing or budgets.

Research on the environment faces a number of difficulties. Existing data on environmental quality are often scarce. Experience with many forms of environmental pollution is too recent to provide carefully tested evidence pointing to firm conclusions about causes, effects, and remedies. Rosenbaum concludes that almost every significant environmental problem is fixed in a matrix of ecological, economic, political, or scientific causes and consequences that usually frustrate quick and simple solutions.

One can conclude that there is a similarity in environmental disaster studies regarding the methodology of the research and the assessment of the social, economic and psychological consequences. In both studies, Buffalo Creek and Love Canal, there was a loss of community, loss of contact with others, disturbance and distortion. The social and psychological impacts of the disasters on the individuals were obvious, and there is evidence of individual pathology. Compensation for the

victims was reached through a process of bargaining and long negotiations. However, the rejection of corporate responsibility for violations of people's rights was always the beginning play on the corporate side.

Family response to chronic environmental disaster has been found to vary according to family structure and family stages. A family consisting of an older couple without children tends to respond negatively to environmental disasters. Older couples are not interested in participating in activities that could cause them the loss of secure income or property. On the other hand, a family consisting of a relatively younger couple with young children tends to be more active in responding to environmental threat. Fear about the health of the children becomes an important motive that influences a younger family's responses.

This contrast in family response is described by Fowlkes and Miller (1987) who address the sociocultural factors determining participation in a social movement. In the Love Canal incident, the community was divided in their views of the disaster. Fowlkes and Miller describe as "minimalists" those who believed that the chemical contamination from the landfill was limited in scope with little, if any serious consequences for health, and as "maximalists" those who saw the problem as a very serious health risk. In this context, positive or effective family response can be viewed as the intentional efforts and activities performed by family members in order to reverse an actual environmental threat through participation in community protest.

This study explores familial variables that influence behavioral responses to environmental hazards. It is expected that some of the study variables will be more influential than others in explaining variation in the dependent variable. Using family as the unit of analysis, I examine the impacts of interfamilial aspects on response to the crisis. For example, it is anticipated that type of family is a

significant determinant of the family response. A family with young children will be much more effective in its responses to the toxic waste threat. Studies investigating family responses to disaster have found evidence of family disruption and change within the family. "..exposure to toxic substances has come to be recognized as a significant environmental stressor, having social and psychological ramifications for the individual, the family, the community and society" (Altman, et. al., 1987). In analyzing family response to environmental disaster, family dynamics emerges as an important issue that provides an understanding of the processes that leading to a positive family response.

The findings of this study will contribute to understanding the reaction of a family to toxic waste. In the absence of government effectiveness in protecting citizens' lives, people must be aware of their potential to stop an undesirable threat. The new role that the family must play to protect its well-being contains both positive and negative considerations. On the positive side, the family that finds itself in an environmental crisis is pushed to learn and experience in a new situation that necessitates its search for its own strength and resources in order to face such conditions. Coming from this experience, the family will discover its abilities and learn to become more constructive and positive in facing similar experiences. The negative aspect of such an experience can be seen in the tremendously stressful experience that the family undergoes which could have some negative impact on its functioning and its stability. Coming out of such an experience, the family might feel frustration, disappointment and mistrust of the system. Ideally, a family will feel secure from such stressful situations when the government establishes and manages a comprehensive environmental policy that considers the safety of its people. Apart from these findings, the study could be effective in the field of family studies, as it will provide some implications for family dynamics in the process of social change.

This study also contributes to the field of social movements in general. Citizens' responses to environmental hazards were studied by Levine (1982); Walsh (1981); and Cable and Degutis (1991). Walsh (1982) assessed the intense first year of grass roots mobilization in the community of Three Mile Island after the 1979 nuclear accident. The author considers grievance an important variable in precipitating and sustaining protest. Cable and Degutis (1991) investigated the effects of protest and mobilization on two communities. The founding of a citizens' protest organization stemmed from growing grievances and anger over the major disruption of lifestyles and fears regarding health effects. City, county, and state governments' inability or unwillingness to help increased community disappointment and encouraged residents to pursue legal actions against the city. The fundamental point in the study of a community's response to toxic contamination is that people must rely on their own resources in order to challenge injustices and reverse life threatening circumstances.

Research in social movement participation has relied heavily on the individual as the unit of analysis. Thus, the decision of an individual to become involved in a social movement depends, not on factors associated with the family, but on the individual's motivation. The traditional interpretation of motives leading an individual to participate in a social movement emphasized personality characteristics as the main determinants (Hoffer, 1951). However, the literature review provides empirical evidence of the limitation of such view. Resource mobilization perspectives present a set of independent structural variables that determine recruitment and social networks that facilitate participation (Cable, 1990).

In this study a new approach is employed, viewing the family as the unit of analysis. The assumption underlying this view is that family is a set of interrelated parts in which a decision by one member affects the family as a unit. Accordingly, participation in a social movement is a

decision that involves many aspects within the family. Family dynamics, family roles and rules, family themes and interaction are some of these aspects that have direct and indirect effects on the family's response to environmental disasters. This view is also supported by the family system perspective which views the family as a whole.

A number of studies have discussed the role of women in responding to environmental disasters. Cable (1990) discusses the concept of the motherhood effect and argues that social activism is not necessarily the product of the mother's concern over her children's well-being. The literature provides some evidence of gender differences in responding to environmental disasters. Women's activism is seen in an historical perspective such that women's involvement in the environ-mental movement is an extension of the women's movement in the United States (Buechler, 1990). Buechler addresses the a question of how 'women' can be mobilized since they are dispersed throughout the social structure. The partial answer to such a question is that in particular circumstances, where women perceive their role as 'mothers' who should act positively to protect the health of the family, they may become mobilized and play a significant role in social movements (e.g. the Love Canal incident).

Exposure to toxic materials presents a new challenge to the well-being of increasing numbers of communities in the U.S. Earlier studies of the impact of technological disaster revealed evidence of the negative consequences that families and communities experience. These studies introduced the term environmental stress. To relate such psychological phenomena to the family, we may define family stress as a state of tension that arises from an actual or perceived demand and calls for adjustment or adaptive behavior. Adjustment to a stressful event varies from individual to individual and from family to family. Figley (1983) describes the process that a family experiences during a catastrophic event. "These events and the pile-up of other normative stressors can cause the family to experience crisis under certain conditions. However,

a catastrophe requires immediate attention and is, thus, synonymous with crisis" (Figley, 1983, p. 5). The magnitude of the catastrophic event determines the extent of disruption to the life style and routine of survivors and changes the family rules, roles and responsibilities.

Figley constructed a conceptual framework that helps in understanding individual reactions in disaster. The author identified four perceptions common to survivors of major disasters that make their experiences catastrophic: 1) people perceive disasters as highly dangerous; 2) disasters cause a sense of helplessness; 3) disasters cause community-wide perceptions of destruction and disruption; and 4) disasters result in a sense of loss. I adopt this view in the present study to explain the magnitude of the stress that disasters cause to people's lives.

The ABC-X model (Hill, 1949) considers family resources as another factor that affects family responses to crisis. Based on this model, a family coping response depends on: 1) the amount and the type of recent stress a family has faced; 2) the type of support from different institutions; 3) the support received from a family social network; and 4) the magnitude of the role change involved.

Families vary in their perception of risk. Covello (1981) discusses the most important questions in relation to risk: What factors influence individual perceptions of risk? What accounts for anomalies in the way individual and groups behave when faced with ostensibly comparable risks? The author believes that a number of variables such as ethnicity, religion, sex, region of the country, age, occupation, education, income, marital status, and cultural background affect risk perceptions.

Researchers in the field of social work have not systematically, empirically addressed the effects of technological disasters on families and communities. The few theoretical studies in the field (Soine, 1987; Rogge, 1993) call attention to the importance of social work participation in this area. Rogge (1993) believes that social work has a historical commitment to social welfare, justice and equity. This

commitment necessitates the importance of understanding the impact of environmental disasters on the individual, the family and the community. "Social work educators, practitioners, and students have a compelling call to act where poverty, discrimination, and environmental hazards threaten communities" (Rogge, 1993 p. 112).

Social work educators perceive the role of social work intervention in environmental hazards to be the development of new curricula and field practice. This new curricula should incorporate specific knowledge that pertains to the preparation of social work students for more effective intervention in such a problem. Soine (1987) stated that for a profession that has historically addressed the interaction between individual and the environment, it is no longer possible to ignore the importance of these factors in the lives of clients and communities. Soine suggested four curriculum modules: 1) an overview of environmental contaminants and social work; 2) environmental contaminants and human health and well-being; 3) environmental policy in the best interests of human health and well-being; and 4) the implications of environmental hazards for social work practice.

But these views of the role of social work intervention lack the practical experience and knowledge base that a researcher can see is difficult to achieve without empirical research. For the adequate development of social work intervention, the profession can no longer depend solely on the findings of other disciplines without themselves going through the experience of trying to understand the complexity and the dynamics of the problem first-hand. Accordingly, the current study integrates knowledge and theories from different disciplines and utilizes a theoretical and empirical framework to answer specific questions related to the environmental hazards problem.

1) How do families and communities perceive the problem of toxic exposure? To what extent does such a problem influence their lives?

2) What factors determine family response to environmental hazards?

3) What are the family dynamics involved in the problem of exposure to toxic hazards?

4) In defining the role of social work as a profession, what are the premises that influence such a role in protecting the welfare of the individual, the family and the community?

CHAPTER II

THEORETICAL FRAMEWORK

This study explores a number of analytical frameworks using theories from a number of fields. Factors determining family response to environmental disaster will be reviewed in light of family functioning and family stress theories. To assess the impact of environmental pollution on families and community, the social process model (Edelstein, 1988) will be adopted to explain the interactive processes that a community faces during its experience with environ-mental pollution. Finally, social movement theories have contributed to the better understanding of the emergence of social protest. Resource mobilization perspectives are useful in providing a practical interpretation of the processes that lead to the development of social movements.

Family Functioning and Family Relationships

A family, like other systems, is a set of interrelated parts that maintains interaction within a system in order to achieve specific goals. Galvin and Brommel develop a new conceptualization of the term: "a family may be viewed more broadly as a group of people with a past history, present reality and future expectation of interconnected mutuality influencing relationships" (1991, p. 3). This conceptualization emphasizes the personal, connected relationships among family members, instead of relying solely on blood ties or legal contracts as the basis for a family. Such a view encompasses countless variations and numerous interactive patterns.

Family responses to environmental threat are determined by a number of factors. Through the socialization process and family experience, an individual is trained to apply specific strategies to specific situations. As a family tries to understand and decide what to do about an environmental disaster, the course of action implemented will be

affected by: family perception; the coping mechanism to be chosen; and the dynamics within the family.

// This study examines the different processes within the family and outside its boundaries that might shape families' responses to a chronic environmental disaster. With a definition of the family as a primary group, an emphasis will be placed on family functioning and interaction. Given the assumption that an individual's behavior is influenced to some degree by the level of family functioning, it is important to draw a distinction between assessment of individual members of a family and assessment of the family as a unit.

To analyze the impact of family functioning on the family's response to environmental crisis, I first define family functioning. A family that normally functions in a healthy manner is likely to make a more adaptive response to crisis, once protection against environmental threat is seen as a family responsibility. A family that normally experiences internal stress is less likely to respond adequately to environmental threats. The psychological pressure that such a family experiences may even hinder its ability to perceive the threat.

Fisher, Giblin and Hoopes (1982) state that healthy family functioning is characterized by an attitude of comradeship and mutuality among family members. Members in a healthy family are generally reciprocally accepting, supporting and caring for one another. They honor their agreements with commitments to one another. At the same time, behavioral and attitudinal differences among members are respected. These qualities are achieved through open and direct communication. Members of a healthy family are encouraged to express their feelings and thoughts which are then attended to and valued by other family members. These behaviors, as Fisher et al., (1982) explain, result in family members feeling secure, trusting, and positive about and in the family.

Walsh (1982) indicates that the term "functional" refers to a judgement about the utility of a structural or behavioral pattern in

achieving objectives. According to this conceptualization, a family should maintain a definite structure and a particular set of behavioral patterns in order to achieve specific functions or objectives. Walsh summarizes the argument on normal family functioning by presenting eight dimensions on which healthy and dysfunctional families are distinguished:

1. Individuation versus enmeshment
2. Mutuality versus isolation
3. Flexibility versus rigidity
4. Stability versus disorganization
5. Clear versus unclear or distorted perception
6. Clear versus unclear roles or role conflict
7. Role reciprocity versus unclear or conflictual roles
8. Clear versus diffuse or breached generation boundaries

Such distinctions will be used in the theoretical guideline to assess level of family functioning in this study.

The system perspective provides one way to gain insight into family functioning and family communication. This perspective indicates that each individual is a part of an overall family system affecting and being affected by that system. This view enhances understanding of individual behavior within the context of the family since it requires that, in order to understand an individual's behavior, we have to view the context of the human system within which the individual functions. Within a system, the parts and the relationships among them form the whole; changes in one part will result in changes in the others. As events affect one member of the family, other members make the required adjustment in relationships in order to meet the change in the affected member.

According to this view, function is something that a system must do in order to avoid breaking down. Galvin and Brommel (1991) introduce two primary family functions in their attempt to describe family functioning. The primary functions include establishing a pattern of cohesion, or separateness and connectedness, and establishing a pattern for adaptability and change.

Cohesion implies "the emotional bonding members have with one another and the degree of individual autonomy a person experiences in the family

system" (Olson et al., 1979). Therefore, cohesion in a family affects and is affected by the communication that family members are able to develop and maintain. Cohesion provides the family with the inner strength required during the time of crisis. Similarly, cohesion could be conceptualized as a family resource to be utilized in resolving and coping with crisis.

The second primary function is the establishment of a pattern for adaptation and change. This affects the family's ability to promote change. In the family life span, change becomes necessary as the family crosses developmental stages. During a crisis, a family should be able to adjust to new roles, rules, and relationships. The family as a system needs periods of stability and periods of change in order to function effectively under different circumstances.

Galvin et al., also identify secondary family functions. One secondary function is the ability of the family to create an image that provides the family with its philosophical identification. Family image serves as a frame for future thoughts and actions. For example, a family could perceive itself as a unit that provides emotional support and protection for its members. Another family image could view the family as a corporation involving a strong structure. In this context, family themes become important in helping the family identify its position in relation to the outer world that affects every aspect of family life. In this discussion, a family theme is defined as "a pattern of feelings, motives, fantasies, and conventionalized understandings grouped around a particular form in the personalities of individual members" (Hess and Handel, 1959). Family themes represent a fundamental view of reality that involves a philosophical interpretation of reality.

Galvin et al., believe that themes deal with family perceptions regarding specific issues such as physical security, strength, dependability, inclusion and separation. Themes are statements that actualize family values. In this study of factors determining family

involvement in community problems such as pollution of water resources, I propose that family themes play a crucial role in the way a family responds to environmental threat. Living according to themes necessitates the development of various patterns of behavior that affect: the way members interact with outside world; the way they interact with each other within the family boundaries; and the way they develop personally (Galvin et, al., 1991).

Another supporting function of the family is maintenance of family boundaries. Galvin et al., 1991 indicate that family boundaries involve the establishment of psychological and physical forces that regulate access to people, places, ideas, and values. These boundaries influence the pattern of interpersonal communication that occurs within the family. For example, a family with closed boundaries may lack information and ideas about what is happening outside. In contrast, open family boundaries may provide access to the outside world and facilitate gaining new experiences through involvement with other systems. A family with closed boundaries is likely to have rigid patterns of communication that are structured and carefully delineated.

Analysts agree that family functioning is a multidimensional concept. Moos (1974) has suggested that family functioning can be viewed in terms of three major dimensions. She defines relationship dimensions as "The extent to which family members feel that they belong to and are proud of their family, the extent to which there is open expression within the family and the degree to which conflictual interactions are characteristic of the family" (Moos, 1974 p. 5). The significance of family relationships as an index of family functioning was examined by Galvin and Brommel: "the relationship within the family reflects type of family dynamics and creates a sustainable amount of energy that drives the family actions" (1991, p. 31). Consequently, it is important to examine the level and quality of relationships as a prediction of family functioning and as a way of anticipating family actions.

The results of studies reported by Bloom (1985) suggest that other components can be identified as part of the relationship dimension. These components include: family sociability, conceptualized as "the extent to which family members seek and derive gratification from social interaction with others; family idealization, "the extent to which the family is praised by its members"; and family disengagement, "the extent to which family members fail to be drawn to each other or to be independent" (1985, p. 236).

Moos's second dimension of family functioning is personal growth. This dimension refers to the level of emphasis within the family on certain developmental processes fostered by family living. System maintenance is considered by Moos as the third dimension in family functioning. She conceptualizes this dimension as information about the structure of the family and the degree of control exerted by family members vis-a-vis each other (Moos 1974, p. 5).

Bloom concludes from Moos's work that the relationship dimension includes family cohesion, expressiveness, conflict, sociability, idealization, and disengagement. Studies of family functioning indicate that some dimensions are more relevant than others to this multidimensional concept. These more critical dimensions include cohesion, the ability to grow, adaptation, communication, affective involvement and control.

Certain of these dimensions should be studied carefully in relation to other factors. For example, Bloom believes that the personal growth dimension includes intellectual, cultural, active/recreational, and religious factors. The impact of culture and religious factors on personal growth is quite apparent when we deal with rural communities in the Appalachian region. A number of studies assessing the normative and values base for Appalachia have found significant distinctions and unique characteristics.

Stress and Family Coping Strategies

One of the assumptions underlying this study is that exposure to environmental disasters is a stressful life event for a family. In this study, exposure to water pollution is used as the empirical example of an environmental crisis. Research in environmental pollution has shown a consensus in considering such events as stressful (Edelstein, 1984; Gibbs, 1982). A number of theorists have developed their own conceptualizations of the term "stress." A stressor, according to Hill (1949), consists of those life events or occurrences that are of sufficient magnitude to bring about change in the family system. Lavae, McCubbin, and Olson (1987) state that "stressor events can be characterized by their unexpectedness, their greater intensity and chronicity and their undesirability and serious effects" (1987, p. 859).

Studying the impact of stress on the family, Brown (1980) defines a stressor as "a stimulus or force" that has an impact on the individual or family and that may or may not produce stress, depending on the individual's or the family's perceptions, resources, and context. Other researchers believe that stress is not inherent in the event itself but is, rather, a function of the response of the distressed family to the stressor (McCubbin, Joy, Cauble, Comeau, Patterson & Needle, 1980, p. 857). Boss (1987) defines family stress as an upset in the steady state of the family. She explains that not all stressed families are in crisis; rather, many avoid crisis by managing to hold the degree of stress to a tolerable level. This process is called coping.

Family stress theory distinguishes between normative stress and non-normative stress, the latter caused by unexpected stressor events. Sources of stressor events are classified as inside or outside the family. An example of a stressful life event from outside the family is technological environmental disaster. Another categorization of stressor events is chronic versus acute events. The attempt to specify type, attributes, and characteristics of the stressor events stems from Boss's

recommendations that researchers should identify and describe categorically the events they are investigating. Such a strategy emphasizes the importance of both the general and specific characteristics that describe chronic stressors.

Hill's ABC-X Model (1949) presents a framework for family stress theory that focuses on three variables: A, the provoking event, or stressor; B, the resources the family possesses at the time of the event; and C, the meanings that the family attaches to an event. These variables constitute the foundation of family stress theory. Several attempts have been made to expand this framework to include more dimensions.

Building on Hill's ABC-X model, McCubbin and Patterson (1983) have developed the Double ABC-X model (Figure 1)[1] to describe family adjustment and adaptation to a stressor or family crisis. Their model states that a stressor event (A) interacts with the family's crisis meeting resources (B), and the meaning the family gives to the stressor event (C) in order to adjust to the crisis (X). The model suggests the processes that a family could utilize to cope with stressful life events. The nature and magnitude of the stressful event is an important component of this model. Boss (1987) created the Contextual Model of Family Stress to identify the extrafamilial and intrafamilial contexts that influence the way family members perceive the stressor event.

Application of both family stress models to environmental pollution as the stressor predicts that a normal family, or a healthy functioning family would develop a set of common meanings that would be helpful in defining stressful events. Both models emphasize the importance of the family's perception of life events. Family perception of an environmental stressor is determined by a number of factors such as: family risk perception; the nature, duration, and magnitude of the event; previous experience with a similar event; and the family's sense of

[1]All figures and tables may be found in the Appendix.

justice and well-being. Family perception of the event also depends on previous experiences, level of education, interaction with other systems, and knowledge of the stressful event. The Double ABC-X model introduces the concept of pile-up in regard to the accumulation of stressor events. McCubbin and Figley (1983) refer to pile-up (aA factor) as demands that call for family adjustment and adaptation. A family might experience a pile-up of demands, particularly from a chronic stressor such as the pollution of water resources. The Double ABC-X model identifies five broad types of stressors and strains that contribute to a pile-up in the family system in a crisis situation: the initial stressor and its hardships; normative transition; prior strains; the consequences of the family's effort to cope; and ambiguity, both intrafamily and social.

Family adaptive resources (bB factor) refers to the family's capabilities for meeting demands and needs that emerge in the crisis. The family stress model (McCubbin & Patterson) identifies three kinds of resources that affect family adaptation to crisis: family members' personal resources; the family system's internal resources; and social support. Personal resources can include money, time, experiences, and personal qualities. Internal resources within the family vary from family to family. Some researchers tend to include family relationships as internal resources; the strength of relationships could be a facilitative process in creating common meanings within the family. Family resources include level of family functioning, referring to adequate levels of cohesion and adaptability.

Social support is considered a type of resource that a family could utilize in the process of dealing with stress. Researchers define social support according to its source, type, and quality. Social support could be generated inside the family boundaries as well as from other outside sources. Types of social support include: emotional support that promotes feelings of care and love within the family; esteem support that enhances the family's belief in its value; and network support, a

critical type of support that involves a sense of obligation and responsibility between the family and surrounding systems. McCubbin et al., (1983) argue that the availability of social networks (e. g. neighbors, kinship groups, and mutual self help groups) and the ability of such networks to provide support vary greatly. In general, social support serves as a protector against the effects of stressors and promotes recovery from stress or crises experienced in the family. Studies of social support conclude that social support makes individuals and family units less vulnerable to crisis when they experience stressors such as natural disasters (Erikson, 1976).

An important contribution of the family stress model is its emphasis on family resources (bB). This emphasis helps the family discover its own resources and reflect on some inner strengths that a family might not discover otherwise. In the original model of family stress (Hill, 1949), family resources are defined in comprehensive terms as "the sociological, economic, psychological, emotional, and physical assets on which the members can draw in response to a single stressor event or an accumulation of events" (Boss, 1987).

The (cC) factor in the Double ABCX model refers to the family's perception of the stressor event. Galvin et al., hold that the cC factor refers to the way in which a family interprets a crisis, including the meaning the family gives to the stressor event and to the added stressors caused by the original crisis, and the family's perception of how to bring the family into balance. Family stress theorists discuss the importance of the way a family defines the stressor event. An assumption of this study is that stress is interpreted differently by different people, so that the responses to stress vary from individual to individual, and from one family to another. Reiss (1981) called attention to the "family construction of reality" as a determinant of how families find solutions to problems.

Boss reflects on the cultural variables that determine the family's

perception of stress: "in order to understand the perception of a stressful event and the subsequent coping strategies used by a family, researchers must first determine the family's beliefs and view of the world. Certainly, the value orientation of mastery is a relevant component in the family's perception of the event and its decision on coping strategies" (Boss, 1987, p. 717). Family stress theorists conclude that the family belief system is crucial to the way a family perceives stressor events. This view was expressed by Erikson (1972) and by Feldman and McCarthy (1982) in their studies of community perceptions of natural disasters.

Research in environmental disasters distinguishes between chronic disaster and acute disaster. Chronic disaster is characterized by its longevity which produces a different set of perceptions, impacts and responses. Family stress theory considers chronic environmental disaster as a source of chronic stress. Boss defines chronic stress as "a situation that runs a long course, is difficult to amend, and has a debilitating effect on the family" (1987, p. 699).

A number of characteristics are used to specify chronic stressor events. These characteristics include: ambiguity versus predictability, where uncertainty regarding the facts about the stressor event is present; the context in which the chronic stressor event develops, that is, whether it is the result of a larger context such as inflation, living near an active volcano, and the closing of a factory, or the result of an individual pathology, such as the continuous illness of a family member; and the visibility of the stressor event, particularly where some events cannot be observed or assessed. Chronic events such as the contamination of a river can be observed through the color of the water and its odor. But some types of pollution cannot be observed, such as dioxin level. The unobservable pollutant can be far more harmful than the visible one.

The importance of the definition of type of stressor event was

highlighted in Boss's work because understanding the stressor event provides a clear description of its level, its magnitude, and the way a family perceives the event and copes with its impact. "Because of the import of both general characteristics and specific descriptors of chronic stressors, it is essential that researchers identify and describe categorically the events that they are investigating" (Boss, p. 699). Monat and Lazarus define coping as "efforts to master conditions of harm, threat or challenge when a routine or automatic response is not readily available...environmental demands must be met with new behavioral solutions or old ones must be adapted to meet the current stress" (1977, p. 8). White (1974) indicates that coping refers to adaptation under relatively difficult conditions. The process of coping, according to Lazarus includes: direct action behaviors, attacks on the social environment; and intrapsychic forms of coping, defense mechanisms (e.g., detachment or denial) designed to reduce emotional arousal rather than to change the situation.

Boss believes that although Lazarus's theoretical work is psychological and directed to individual stress, it is relevant to family stress theory. According to Lazarus (1966, 1984), an individual's coping behavior is organized, not by emotions, but by the cognitive process that leads to the emotional response and is directed to dealing with the problem generated by the stress induced emotion and to control the emotion. These processes of coping represent functional coping; but dysfunctional coping may be utilized by some families. Dysfunctional coping neither represents learned behaviors nor implicitly follows family rules or paradigms.

// The term family paradigm was introduced by Reiss (1981) in relation to family coping patterns. Studies reveal evidence for the inheritance of coping strategies (Boss, 1987; Reiss, 1981). Coping patterns are passed from generation to generation, influenced by cultural variables. Families may pass down coping strategies that elicit either physical

aggression or total submission. Social scientists believe that religious and cultural values influence the choice of coping behavior. Moreover, coping research indicates that active versus passive behaviors are most predictive of how adequately individuals and families will function (Boss et al., 1979; Lazarus, 1977; McCubbin et al., 1980).

Boss (1987) discusses cultural factors that determine family coping strategies. She argues that, in order to understand the perception of a stressful event and the subsequent coping strategies used by a family, researchers must first determine the family's beliefs and view of the world. A value orientation of mastery is a relevant component in the family's perception of the event and its decision on coping strategies. Boss introduces two main coping processes that are influenced by culture. "Researchers and therapists must be aware that the variables of fatalism versus mastery are, by their very nature, highly related to the variables of supporting the status quo versus change" (Boss, p. 717). The question raised is whether the belief system influences the inability to cope actively with the stressor event or whether the lack of resources to cope actively with the event fosters a fatalistic belief system as an adaptation. Resources include personal and familial resources as well as different types of resources.

Only active coping is viewed as a means to change the direction and alleviate the impact of the stressor event. A family which believes in acceptance, according to Boss, may make the stress less psychologically painful, but it will not halt or reverse the process of destruction and crisis presented by the threat. Reflecting on the impact of cultural variables on coping with stress, Boss develops a number of related assumptions: family belief systems such as mastery or fatalism influence vulnerability and recoverability levels in stressed families; with a belief system of fatalism (as opposed to mastery), a family may give a qualitative meaning to any specific stressor event; and, although a fatalistic belief system may be functional in the short run, when a

disastrous event strikes and nothing can be done to reverse it, that same belief system may be dysfunctional in the long run because it interferes with social change.

Boss summarizes her views by introducing the contextual model of family stress. The model indicates that a family's perception is mediated by the context in which the stressful event or situation occurs. Boss considers the family's context from a social-psychological and biological perspective at both the macro and micro levels of analysis. The external context of a stressor event or situation is comprised of six indicators: historical, economic, developmental, constitutional, religious and cultural. The contextual model provides a comprehensive framework for understanding stressor events.

Historical context refers to the time when the event takes place. Economic context is the state of the larger environment's economy. It could also refer to a major change in the family's economic environment, resulting in economic gain or loss. Developmental context is the stage in the life cycle of both individuals and the family itself. For example, families of older couples might perceive the stressor event differently from families of younger couples or families with young children. Constitutional context, according to Boss, refers to the state of biological health and physical strength within the family. Such conditions are important to determine suitable physical strength, stamina, and resilience, important determinants of the coping process. Religious context influences how a family perceives an event. In a disaster caused by human error, some people interpret the event as God's will (Erikson, 1972). Finally, cultural context makes up a major part of the external context because it provides the canons and mores by which a family defines events of stress and their coping resources. The cultural incongruence between the internal and external context could cause a family to experience a high level of stress.

The six dimensions of the family's external context influences its

internal context. The internal context of family stress, according to Boss, is made up of three dimensions: the sociological, the psychological, and the philosophical. The sociological context refers to the structure and function of the family and involves its boundaries, role assignments, and perceptions of who is inside and who is outside those boundaries. The philosophical context of the family consists of its values and beliefs on a micro level. For example, some families believe that fighting the source of pollution is the most appropriate behavior, whereas others believe in passive acceptance of the pollution. Some believe that the polluter will eventually correct its mistakes. "Although these beliefs and values are influenced by the larger cultural and religious contexts, the family philosophy most directly influences its perception of a stressful event. Furthermore, the internal context, more than the external context, is in the control of the individual family" (Boss, p. 720).

The contextual model provides an overview of both internal and external contexts that mediate in the perception of family stress. The significance of the model consists in its comprehensive emphasis on factors believed to affect both family perception and the choice of coping strategy. Boss indicates that if the family perceives a stressor event as ineffective and chooses to deny its impact, denial might be a coping strategy for dealing with stress. Another important factor that the model incorporates is the impact of external variables on family perception of the stressor. Cultural variables have been found to be influential factors in determining family perception and the choice of coping strategy.

The Social Process Model

Edelstein (1988) developed the Social Process Model (Figure 2) to examine technological disaster and its relationship to the social context of the disaster. The model will be used in this project to provide a

better understanding of the impact of environmental disaster on the individual, the family and the community. The theoretical framework of the model is based on four postulates: 1. the social and psychological impact of toxic exposure involves complex interactions among various levels of society. They also differ across time and environmental context; 2. these impacts not only affect how victims behave but how they perceive and comprehend their lives, in both short and long terms; 3. toxic exposure incidents are stressful, forcing victims to adopt some form of coping response; and 4. contamination is inherently stigmatizing and arouses anticipatory fears.

Postulate One indicates that toxic exposure is likely to entail social and psychological impacts, both from the exposure itself and from the social context of the disaster. Accordingly, effective response to the disaster is determined in psychological as well as social parameters (Edelstein, 1988). The model recognizes that any complex event, such as toxic exposure, has impacts at various levels of society both simultaneously and over time. Accordingly, any occurrence affects individuals, families, and other relational groups, more formal associations, the community, and the society.

These contexts are examined in the light of two dimensions, the historical and the environmental dimensions. The historical dimension indicates that groups, organizations, and communities are influenced by specific and relevant past events. The environmental dimension includes both the physical and social environments and how both are affected by toxic exposure. The linkage between the historical and the environmental dimensions is in the continuous interaction between the historical realities of the exposure and the present situation of people's lives. The model suggests that the response of an institution to toxic exposure reflects not only the influences of other levels of process or the institution's own history, but also its border social environment.

Postulate Two hold that toxic exposure affects both action and

cognition. At each level of social process is a pattern of functioning that reflects a both normal set of behaviors, the "lifestyle", and a normal framework for understanding the environ-mental "lifescape". Edelstein conceptualizes "lifestyle" as a people's way of living, including their pattern of activities and the relationships needed to sustain these activities. Lifestyle refers to the core assumption of a society as reflected in the pursuit of more personal goals. The achievement of these goals, as Edelstein indicated is called the quality of life "encompassing such factors as economic security, family life, personal strengths, friendships, and the attractiveness of physical environment." (1988: 11).

In contrast, the term lifescape refers to people's fundamental expectations of the world. It reflects not only people's unique interpretive frameworks, but also the shared social and personal paradigms used by people to understand the world. People are rarely aware of their lifescape until an action disrupts their lifestyle or in some way disconfirms their operating assumptions (Edelstein, 1988). The concept of lifescape provides a way to examine people's confusion and distrust resulting from their experience of a challenging stressful life event. Edelstein provides examples of the direct impact of toxic exposure on several such dominant social beliefs as humans' dominion over nature; one's personal control of one's destiny; technology and science as forces of progress; the acceptability of risks in exchange for the good life; people get what they deserve; the infallibility of experts; the self-regulation of the marketplace; the inviolability of one's home; and the protectiveness of government. Such beliefs represent social realities and people tend to adhere to them. People who suffer toxic exposure and yet have strong beliefs in the social paradigm may deny, rationalize, or minimize the effect of such exposure.

Edelstein's Postulate Three suggests that toxic exposure is inherently stressful. Edelstein agrees with others that toxic exposure

may cause new strains in victims' lives, intensify existing strains, or give new meaning to old problems. In reference to exposure to toxic materials, stress is viewed as the physiological, psychological, and social costs exacted by everyday life. However, the Social Process Model considers stress as not solely the property of the individual, but as occurring at every level of social process, affecting family, relational, institutional, community, and societal dynamics.

At the institutional level, responses to a toxic exposure situation include multiple systems: a) the individual within the agency; b) its public image; c) its association with the government; d) its ability to achieve organizational goals; and e) its use of available resources. The impact of stress on the institution requires a system response to stress rather than an individual response. When a disasters occurs it affects a community in many aspects. So it is suggested that response to a disaster must consider all the economic, social, health, and psychological manifestation of the disaster. Toxic exposure as viewed by Edelstein involves three levels of stress: noxious physical stress; the realization of disruption and harm; and 3) the challenges that vary from simple problems to complex dilemmas. Coping responses to stress likewise vary. While some coping strategies focus on helping the affected system control the disruption, other strategies focus on influencing the source of the threat.

Postulate Four maintains that exposure is inherently stigmatizing and arouses anticipatory fear. This postulate is built on the assumption that stigma is a consequence of being contaminated. Edelstein describes stigma as a victim being viewed by an observer as "deviant, flawed, limited, spoiled, or generally undesirable" (Edelstein, p. 12). Ryan (1971) believes that people, in general, tend to assume that victims deserve what happens to them. In the case of pollution, stigma routinely accompanies the announcement of contamination and the identification of its nature and characteristics. People to some degree tend to blame the

victim, and the stigma can apply to the variety of things affected, residents, places and products.

The degree of stigma applied to toxic exposure depends upon the nature of the exposure, the level of responsibility of the victim, and the prognosis of the exposure. Jones and his colleagues (1984) state that the essence of exposure is fear. Once a community is contaminated, residents view themselves differently. They develop fear of health impacts, such as cancer, threats to unborn children, and cross-generational genetic effects.

Anticipatory fears develop as the perception of threat is associated with future outcomes. People have to deal with their own perceptions of victimization, the view of others toward them, their own fear and the anticipation of their condition worsening in the future. Stigma could involve not only a value judgment imposed by the observer over the victim, but also the conditional behaviors that lead to severe economic consequences such as the boycott of products and services produced by the contaminated areas or the bad reputation attached to people living in these areas by the outsiders.

Social Movement Theories

To study factors that determine family response to environmental contamination, it is necessary to examine theories of social movement and social activism. Because this study is concerned with differences in family response to the problem of water contamination, it is essential to understand the factors that influence such variations. Social movement theories have been concerned with the basic question of "why do people join social movements?" Historically, the field of social movements was dominated by social psychologists who focused on the individual as the unit of analysis. The traditional theoretical interpretation of social movements assumed a linkage between the frustration and disappointment of an individual and the emergence of

movement activity.

Early research on social movement participation describes personality traits and mental states as motivation for social movement participation (Kenniston, 1968; Hoffer, 1951). These theorists relied heavily on the social psychology of participants. Such an emphasis failed to establish significant evidence of individual-level factors that lead to social movement activism. Another early view argued that social change and social disorganization are essential components in creating a state of discontent leading to activism. (Kornchauser, 1959). A substantial shift in the social movement field occurred in the 1970s, as sociologists directed attention to the societal and organizational levels of analysis in their attempts to understand movement emergence and maintenance.

These recent, more sociological interpretations of social movement activism are collectively referred to as resource mobilization theory. The term was introduced by Oberschall (1973) as resource management, indicating the importance of resources in the emergence of a social movement. Resources include material (e.g jobs and incomes) and nonmaterial (e.g. friendship, skills and social network items). According to this conceptualization, resources are dealt with, exchanged, created used or wasted. Mobilizing resources is an essential social movement task. These processes include the ability of community members to make rational decisions in their pursuit of resources.

Mobilization implies that organizations should be rooted in social structure, characterized by dense networks of traditional lines (e.g. kinship) or secondary organizations (e.g. religious). Oberschall's view of mobilization argues that social movement participants tend to be recruited from existing social networks and that participants are active and well integrated within the community. This view suggests that dissatisfaction and grievances alone would not result in long-term, sustained resistance.

The next development in the resource mobilization perspective came

from McCarthy and Zald (1973, 1977). Their new emphasis was on structural variables and on the social movement organization (SMO). They explicitly neglected group consciousness, ideology and grievances. Mobilization is defined as "the process by which a group secures collective control over the resources needed for collective action" (Jenkins, 1983 p. 532). McCarthy and Zald (1977) identify resources as money, manpower, leadership, and elite sponsorship. They emphasize the variety of resources: the relationship of social movements to the media, authorities, and other parties, and the interaction among movement organizations (1977, p. 15).

The importance of grievances in mobilization has been debated. While resource mobilization perspectives acknowledge grievances and discontent as a constant factor in the formation and growth of social movements, they emphasize the critical nature of structural variables in movement emergence. Jenkins (1983) links the importance of both grievances and structural variables in the process of movement emergence.

> The formation of movements is generally linked to improvements in the status of aggrieved groups, not because of the discontents created by the "revolution of rising expectations," but because increases in group resources, organization and opportunities reduce the costs of mobilization and improve the likelihood of success (1982, p. 9).

McCarthy and Zald (1973, 1977) direct attention to the term "manufactured grievances", which refers to the ability of professional social movement entrepreneurs to instigate people's feelings and direct them toward a particular interpretation. For example, professional social movement entrepreneurs might present the facts about the impact of the contamination of water resources on the community. Spreading the word and creating common interest among the community could lead to the enhancement of grievances among people that, in return, could aid mobilization. In regard to manufacturing grievances, Jenkins (1983) suggests that social movement entrepreneurs cannot create something out of nothing: they must utilize major interest cleavages and redefine long-

standing grievances in new terms (Jenkins, 1983).

There has been some empirical evidence of the entrepreneurial theory of social movements, especially in the environmental movement (Wood, 1982). The activities of social movement entrepreneurs resulted in the transformation of community interests into well defined social problems in which grievances become essential in enhancing mobilization. Jenkins (1983) agrees that the entrepreneurial model of grievance definition seems to be applicable to movements representing either deprived groups or broad disorganized collectivities such as the general public (Jenkins, 1983). Although, most resource mobilization analysts assume that grievances, or the raw materials necessary to manufacture them, must be present, it is the larger structures that are the more accurate determinants of social movement emergence. In other words, resource mobilization perspectives assume that grievances or discontent are necessary but not sufficient factors in the emergence of social movements. The perspective assumes that, in any society, enough discontent exists to supply grass-roots support for movements. But the essential requirements involve structural variables.

McCarthy and Zald provide a definition of a social movement as "a set of opinions and beliefs in a population representing preferences for changing some elements of the social structure or reward distribution, or both of a society" (1977: 20). This definition views social movements as preference structures directed toward social change. Resource mobilization perspectives indicate that each SMO has a set of target goals, a set of preferred changes toward which it claims to be working. Accordingly, SMO must possess resources in order to achieve specific goals.

In the process of understanding resource mobilization perspectives, McCarthy and Zald (1987) elaborate some basic concepts and definitions. The framework of this perspective includes the following:

1) The aggregation of resources (money and labor) is crucial to an understanding of social movement

activity. Resources are necessary for engagement in social conflict.

2) Resource aggregation requires some minimal form of organization.

3) Social movement organizations have a number of strategic tasks which include mobilizing supports, naturealizing and/or transforming mass and elite publics into sympathizers and achieving change in targets.

4) Society provides the infrastructure that social movement industries and other industries utilize. The aspects utilized include communication media and expense, levels of influence, degree of access to institutional centers, preexisting networks, and conceptual structure and growth. (1987: 19)

Summary

In this project, I adopt a multi-theory technique. When the research problem revolves around some main concepts but requires a wide understanding of multiple factors, a single theory falls short in providing a comprehensive explanation. In order to identify factors determining family response to contamination of water resources, I must first explain the nature of family functioning. Family system theorists argue that family functioning be assessed by examining the impact of other systems that interact with the family. Accordingly, social, economic, and political conditions are examined as strong effects on family process and family dynamics.

Second, a family dealing with a stressful situation involves a delicate family process that ultimately leads to the adoption of one coping strategy or another. Family stress theory emphasizes that perceptions of a stressful life event determine the nature of the family's response. The Double-ABC-X Model (McCubbin and Patterson) describes the factors that affect the process of stress within the family. Besides family perception, the model introduces the resource factor which indicates that family response is influenced by its ability to identify and deploy its resources. The risk factor is also considered as a major component in this process. The nature, magnitude, source and duration of the stressful situation are some of the criteria that

influence the family response. For example, if the stressful event is powerful, evasive and sudden, the family has little time to understand it, assess the resources needed, or decide on a strategy for dealing with the event.

Third, a strong and healthy family is more likely than a less healthy one to respond positively to a risky situation by choosing a positive coping mechanism and so protect its well being. Social movement theories suggest other societal conditions that facilitate family response. Structural variables are essential to providing a family and a community with facilitative conditions that lead to the emergence of a social movement. In a community characterized by considerable lack of resources, the establishment of a grass-root movement may be difficult.

Research identifies the positive correlations among knowledge, income, and environmental awareness when the level of environmental awareness was measured through the evaluation of individual knowledge of the eco-system. Human behaviors toward the environment are indicators of perceptions of the environment. To evaluate individual or family response to environmental disaster, it is critical to assess levels of environmental awareness.

In examining the impact of toxic contamination on the individual, the family, and the community, the Social Process Model (Edelstein, 1988) provides a theoretical explanation of the unique effects of such a threat on different systems. The adoption of this model is consistent with the overall theoretical framework of the present study. Toxic exposure involves cross sectional dimensions that encompass individuals, families, relationships, institutions, communities and societies. These dimensions have been considered in relation to the historical and environmental dimensions. The comprehensive view of the model of the impact of toxic exposure provides a wider explanation of family responses to environmental contamination.

The adoption of a multi-theory framework aids in explanation of the

interactive nature of the factors involved in the study. For example, the ability of a family to challenge an existing threat is dependent on its ability to identify its own resources as well as being able to utilize existing resources within the community. Political and economic conditions in the community may facilitate the family effort or hinder it in seeking positive solutions. These interactive variables cannot be recognized within the context of one single theory. Accordingly, a multi-theory framework tackles the problem from several angles simultaneously to provide a comprehensive view of many of the factors involved.

In the next chapter a review of the literature is presented regarding the impact of environmental disasters on families and communities. A detailed review of the economic, social, and psychological effects of exposure to toxic chemicals is used in the next chapter to explain the dynamics involved with such a threat. The research on exposure to toxic chemicals provides the necessary knowledge to understand factors that influence family response to environmental disaster.

CHAPTER III.

LITERATURE REVIEW

The literature review on the environment is both voluminous and substantial. While older literature concerns the physical degradation of the environment, the newer literature focuses on the effects of toxic compounds on the environment. Beginning with Silent Spring, an extensive literature has developed. One part of this literature is the toxicological literature studying the toxic effects of compounds. Another part focuses on risk assessment and contamination. A third literature is the environmental policy literature, analyses of the relative adequacy of national response to the problem and federal legislation. A fourth literature explores the ethical issues posed by environmental accidents. Finally, there is an extensive literature on man-made disasters and community response. This study belongs in the last category but focuses more specifically on variables effecting family and community response to technological disasters.

The Birth of Environmental Studies

The issue of the environment has inspired numerous scientists to investigate the impact of chemical and nuclear industries on the environment. Their work is characterized by the presentation of scientific facts and the explanation of ecological impacts. Generally, it can be said that these studies have developed a basis for environmental awareness. Concern about the environment has grown as a result of a practical observation of the continuous decline in the quality of the environment as well as the negative interaction between human beings and the environment. The effects of utilizing advanced technology on a large scale for the purpose of increasing industrial production have been documented in a number of studies. Alarming findings provide clear evidence of the consequences of human and

industrial manipulation of the environment (Carson, 1962; Levine, 1982). Other studies (Schnaiberg, 1980) review the political-economic causes of environmental degradation in an attempt to build a theoretical foundation for the field of environmental sociology. Expansion of production was found to be the critical causal factor in environmental degradation. Schnaiberg (1980) argues that environmental problems are social problems stemming from the way arrange our production processes. Evidence has shown that decisions regarding the environment are strongly influenced by economic and political priorities.

The historical review of the toxic waste problem provides evidence of the severity of the problem. The explosive growth of petroleum-based organic chemistry in the twentieth century made possible a host of new and useful synthetic materials. But each left as byproducts waste materials that were disposed of in the easiest and cheapest ways. (Epstein, Brown and Pope, 1982). Research on the environment has continued to address the magnitude of the global impact of toxic chemicals on almost all environmental resources.

While environmental degradation can be demonstrated, establishing causality between environmental hazards and negative health consequences has been more difficult. "Responsible public health officials have pointed out that the biological effects of chemicals are cumulative over long period of time, and that the hazard to the individual may depend on the sum of the exposures received throughout his lifetime" (Carson, 1962, p. 188). But the sudden deaths of individuals who were directly exposed to these chemicals during wars provided clear evidence of their devastating impact.

In 1962, Rachel Carson's Silent Spring awaked the U.S. to environmental dangers. Carson explained the role of the government in protecting the lives of its citizens: "To the question 'But doesn't the government protect us from such things? the answer is, 'Only to a limited extent' (Carson, p. 181). This simple answer reflects the restrictions

on the government's role in interfering in industrial and business activities. Regulations regarding the protection of the environment have been limited. The critical facts presented in Silent Spring not only informed the public of the risk surrounding the chemicals used in pesticides, but they also brought public attention to the limited role of the government in protecting the public against irresponsible practices by industry. Many assert that before the publication of Silent Spring the federal government had little concern for the impact of toxic chemicals on environmental quality. Economists who advocate economical growth have always denied the externalized consequences of such growth. However, the birth of the contemporary environmental movement in the 1960s reflected the beginning of public outcry over and actual involvement in struggles that concerned the safety of the environment against industrial malpractice.

Most communities that experience environmental disaster have expressed dissatisfaction with the governmental response (Stone and Levine, 1985; Hess and Wandersman, 1985). Findings in disaster research reflect the existence of collective stress among community members. Level of stress correlates with the type of disaster and the support received at that time. In the case of natural disasters, collective stress is apparent when people lose their sense of control and panic because of the material loss of property. Another type of stress is identified in the case of chronic disaster. Such stress is generated by uncertainty regarding the magnitude and impact of the disaster.

Environmental Hazards and the Community

When a disaster occurs, it alters people's lives. Life after the disaster is never the same, and consequently people must make adjustments to accommodate to the changes in their lives. A discussion of various impacts of environmental disasters is essential to fully disclose the magnitude of environmental disasters on people's lives.

Social Impacts of Exposure to Toxic Chemicals

Most disaster research has concentrated on the various effects on people and their environment. Community reactions to environmental disasters have been documented in a number of studies. Sociologists who have assessed the effect of disaster on the community have succeeded in presenting significant evidence of the devastating economic, social, and health consequences of natural and technical disasters.

Erikson (1976) provides a sociological analysis of a technical disaster, analyzing its impact on the individual, the family and the community. The story of Buffalo Creek reflects the consequences of ignoring measures necessary for the safety of the community. The mining company had failed to monitor the increased water level in their artificial dam. Reduced resistance to water pressure caused a break in the dam and a raging current of freed-up water destroyed an entire community in the valley below the dam. Hundreds of people lost their lives and properties.

Review of the Buffalo Creek incident indicates that disasters have a long-lasting impacts on individuals, noticeable effects on families and a tremendous impact on the stability of the community. Collective reactions to the flood reflect the effects of the disaster on people's lives. "It was as if every man, women, and child in the place--every one--was suffering from some combination of anxiety, depression, insomnia, apathy, or simple 'bad nerves' and to make matters worse, those complaints were expressed in such similar ways that they almost sounded rehearsed" (Erikson, 1976, p. 136). Erikson describes how the physical loss of community affects people's emotional, cognitive and psychological stability. Patterns of social interaction are also susceptible of change within the context of environmental disaster. The sudden loss of relationships with old friends and neighbors generates a sense of confusion among people. People become less interested in building new relationships. The term "disaster syndrome" is defined by Erikson as

"the symptoms that make up bereavement. People are grieving for their lost friends and lost homes, but they are grieving too for their loss of cultural surroundings; and they feel dazed at least in part because they are not sure what to do in the absence of that familiar setting" (Erikson, 1974, p. 200).

Erikson's study has significance in that it describes the impact of the disaster on the community and so can help people understand the magnitude and intensity of such disasters. Erikson documents changes that people faced during and after the experience of the disaster. The process that a community must undergo in order to obtain compensation from disaster causing industry indicates that there are no firm rules or regulations to secure people's rights. The absence of such rules is verified in a number of disaster studies.

The Love Canal study by Levine (1982), represents another type of disaster that has been investigated from a sociological perspective. Man-made disasters generated by life-threatening chemical poisoning have unique characteristics. People discover the existence of chemicals in their homes, while children exhibit symptoms of diseases related to toxic exposure. Most of the Love Canal community was united under the common goal of fighting the threat of the chemicals. In this incident, people had to face not only the risk of chemicals, but also the bureaucracy. Scientific research was a major component in their struggle. Residents persuaded independent researchers to investigate levels of contamination. The bureaucrats who fought to keep the status quo manipulated and challenged the research findings in order to justify their no-risk position.

Observers noted the lack of trust between the community and local, state, and federal officials. Parties that were involved in the problem represented different interest groups with varying views regarding the definition of the problem and different prescriptions for handling the situation. The issue of public responsibility was a major factor in the

Love Canal incident. Goldsen (1982) reflects on the different dimensions involved in the interaction between the people and the government.

> Part of the Love Canal story is a success story: government can be forced to accountability when citizens pool their strengths and use publicity and votes as bargaining chips in the game of power politics. But the story is, at the same time, sobering testimony to the eroded meaning of a phrase like public accountability in our modern, high technology society (Levine, 1982, P. xi).

The essence of the Love Canal story can be realized from the fact that people lost confidence in government protection. People realized that, instead of a wait-and-see policy, there are other strategies and techniques that they can use to assert their rights. Ironically, the Love Canal study indicates that people not only have to fight the abusing party, represented in that case, by the Hooker Corporation, but they also have to struggle against a set of rules and regulations created by government and politicians to protect the capitalist system of economic growth.

Edelstein (1982) studied the social and psychological impacts on families resulting from groundwater contamination by a municipal landfill in the Legler section of Jackson, New Jersey. In 1971 a decision by the city to place a dump site created wide-spread discontent among residents who expressed concern that the landfill would threaten the peaceful ambience of their community. Consequently, a group of new homeowners organized a protest against the county decision. Although the protest was unsuccessful in preventing the construction of the landfill, people had the opportunity to mobilize and learn to become activists. This experience convinced them that local officials were not be trusted.

Between 1971 and 1980, 50,000 gallons of garbage were deposited each day in the landfill. People in the community suffered from various impacts of the landfill. Direct impacts included, odor, noise, heavy traffic, litter and dust. Gradual negative effects became apparent, and people felt helpless in reversing the stressful situation. The subsequent discovery of the toxic pollution of water resources triggered

a strong and wide range of discontent, anger and fear among families. City officials warned residents against using water in their homes. The warning caused conflictual responses from community residents. While some families doubted the seriousness of the official warning, others experienced confusion, stress and anger. Uncertainty regarding the truth and unclear explanation of events promoted community distrust.

Anger channeled toward the city government was the dominant reaction. The absence of trust in local government forced residents to adopt other strategies. People gathered in town meetings to share their concerns. Communication among residents resulted in the creation of a new social organization, "Concerned Citizens Committee of Legler." Initially this organization adopted a confrontational approach toward the town council. Information from groundwater studies justified community concern. Concern became fear as people observed the growing number of people suffering from specific symptoms.

Edelstein (1982) believes that the reaction to the pollution in the community caused the disruption of life routines. For many residents, exposure to toxic chemicals became the focus of their lives. Stressful events require victims to make drastic and quick decisions about their daily life. The lack of information and the deliberate attempt of the media to minimize the impact of toxic exposure added another dimension to the complexity of the problem. People expected further effects from exposure through soil, leaky basements and surface water.

The issue of uncertainty was thoroughly addressed in Fleming's study (1991) that suggests that two sources of uncertainty are involved in exposure to toxic chemicals: First, because the actual chemical contamination is often not eliminated for several years, the possibility of future exposure to these chemicals persists. Second, the effects of toxic exposure may in themselves create uncertainty and apprehension. Levine (1982), Edelstein (1988) and Fleming (1991) report that people living near toxic waste sites worry that they or their children will

someday develop cancer or suffer genetic damage that could result in sterility or birth defects. Baum, Fleming and Davidson (1987) suggest that continuing uncertainty about personal future health may be a major cause of chronic stress among people who believe that they have been exposed to toxic chemicals.

Seligman (1975) states that helplessness is conditioned by exposure to uncontrollable events and is associated with motivational and cognitive defects and emotional distress. Because people who live near a toxic site may feel that important events affecting their well-being are uncontrollable, they may experience feelings of helplessness. Research has shown that human-made disasters may threaten people's perceptions of control. People believe that technological accidents result from mishap in human-made systems that are not supposed to fail. Accordingly, the occurrence of such an experience has causes people to feel a loss of control. Residents experiencing exposure to toxic materials may feel that they have little impact on state and governmental agencies that could provide help in minimizing the effect of exposure.

Health Impacts and the Perception of Risk

Edelstein (1988) states that in Love Canal residents were totally preoccupied with health problems. In his interviews, residents of Love Canal indicated that health problems were the cause of worry, financial hardship, lost work, and lost loved ones. Edelstein discusses the process of exposure and its impact on the people's lives: "Expectations about the future are dependent less upon current symptoms than upon perceptions of what victims believe will happen as the result of exposure. Frequently, the result is that anxiety about future illness, a shortened life span, and genetic damage cast a shadow over the future" (1989: p. 49).

In general, as the news indicates more frequent discoveries of toxic chemicals in residential areas, people become more concerned, anxious,

and uncertain about their well-being. The most sensitive issue in toxic contamination relates to the fact that people are less tolerant when causes of contamination are caused by other's irresponsible behavior. "The thought that loss of health was caused by another human's actions is generally disheartening because the loss appears to have been avoidable" (Edelstein, 1989).

In a study of chronic stress among people living adjacent to a leaking toxic waste dump, Fleming et al., (1991) find that "chronic stress in the face of toxic exposure is psychologically driven, that it is largely based on unresolved concerns, fears, or threats driven from the possibility that one has been exposed, and on the fact that confirmation or disconfirmation of these fears must wait many years due to the likely consequences of toxic hazard exposure" (1991: p. 1891). What Fleming et al., refer to is the association between uncertainty and chronic stress. Initially, the researchers believe that chronic stress associated with toxic exposure is related to perception and beliefs about the nature of the exposure. The assumption is that many of the effects of toxic chemicals are unknown, but two more widely known consequences, cancer and genetic change, take many years to materialize or become detectable "... People living near a toxic waste site may worry about their children developing cancer by early adulthood, and individuals who are planning families may be concerned about possible birth defects and complications" (Fleming et al., 1991 p. 1891).

A review of the risk literature indicates that risk perceptions may change rapidly. Research suggests that people do not cope well when confronted with risk problems. The need of people to reduce anxiety may lead to the denial of risk and to unrealistic oversimplications of essentially complex problems. Two of the most important factors that influence risk perception are: 1) information availability; and 2) representativeness, or the tendency of people to assume that roughly similar activities and events have the same characteristics and risks

(Covello, 1981).

Psychological Effects of Toxic Exposure

Living near hazardous sites seems to be a potent psychological stressor. Baum, Singer, and Baum (1981) state that, regardless of whether exposure is actual or imagined, the belief that one has been exposed tends to fuel chronic stress and engender a sense of helplessness. Within the context of a chronic technical disaster, the fact that there is no direct or observable damage makes it more stressful and people struggle with their own perceptions, doubts and views. Fleming et al., (1991) argue that the mechanisms underlying this psychologically driven chronic stress, as well as its possible costs, remain to be specified. Fleming indicates that disasters and human-made catastrophes are common cataclysmic events that sorely tax victims' ability to cope. They believe that stress and a series of potential mental and physical health consequences of stress appear to be among the major consequences of these events. Chronic stress and related consequences appear particularly likely when toxic chemicals or radiation are involved. In addition to potential health risks associated with exposure to these chemicals, residents of contaminated areas experience stress-related problems resulting from uncertainty about and perceptions of serious threats to their health and from feelings of helplessness.

Historically, the concept of behavioral toxicity was developed and attempts were made to describe its meaning. Basically, the concept referred to adverse psychological effects of chemicals absorbed into the body. The starting position adopted by scientists was that the effects of chemicals on organisms are mostly deleterious. "High level psychological functions may be the first to go under the stress of poisons and pollutants" (Sumerfield, 1978).

Specific toxic components affect the nervous system in ways that do not give rise to overt, obvious neurological signs until the extent of

the poisoning is very large (Sumerfield, 1978). Serious consequences of poison toxicity include the loss of self-monitoring, the loss of concentration, and visible change in behavior. Sumerfield (1978) concludes his research by emphasizing the importance of reducing the pollution to avoid more damage to the environment and health. "Reducing pollution even by small amounts should enable more of us to live longer with less behavioral toxicity" (1978: p. 342). Among the psychosocial impacts of toxic exposure is the loss of control. Threatening events shatter the assumption that people need to feel in control of, and be effective in producing, changes in their physical and social environment. They lead to new perceptions marked by threat, danger, insecurity, and self-questioning (Janoff-Bulman and Frieze, 1983). Edelstein found that, after the discovery of toxic chemicals in Legler, victims not only lost their sense of control, but many of their other most cherished personal beliefs were challenged. A key element in the loss of control was the uncertainty of the situation. In the same study Edelstein also found that residents experienced a loss of trust in others, generally, and in government, specifically. At both Love Canal and Legler, loss of trust is apparent where residents experienced a lack of adequate response from the government; consequently, they questioned the assumption that government takes seriously its role of protecting citizens against man-made disasters. Government officials have invariably failed to provide the public with definitive explanations regarding contamination in their communities. This behavior is common. It correlates with no clear vision of a comprehensive and clear plan of resolving the situation. "Whether residents were disposed to remain or anxious to leave, they received no confirmation or reassurance about the hazard or safety of the situation" (Fowlkes and Miller, 1982, p. 119).

Responsibility is a major element in disaster research where victims struggle with the questions of 1) who is responsible for the disaster and 2) who is responsible for the compensation of victims and cleaning up the

physical damages. Such conflict has both psychological and social ramifications. In most of the technological disaster literature, companies and corporations are quick to deny any responsibility. To establish and maintain this stand, companies expend tremendous amounts of money. Such a stand exacerbates victims' reactions, because they have to be involved in different battles with different parties on many levels.

The issue of distrust becomes crucial when victims receive no clear support from officials. Arguments with the company, the responsible party, will be very stressful for the victims when the company strongly denies any wrongdoing. In negotiating claims of compensation, victims usually have to face a better prepared and most insensitive opponent alone.

A qualitative study conducted by Gibbs (1982) confirms Edelstein's analysis of the toxic waste effect in the community of Legler. Gibbs used clinical measures to assess the social and psychological impact on the community six years after the Legler incident. The researcher found that 96 percent of the community reported emotional reactions due to the incident. "Beyond health worries they reported feelings of disturbance, anger, depression, family quarrels, mistrust of others, financial worries, feelings of being trapped or helpless, divorce or separation due to the crisis, nervous breakdown, and interpersonal aggression linked with the crisis" (Gibbs, 1982). These findings support the assumption that a toxic exposure incident has a wide range of impacts on people's lives including personal and intrapersonal relationships.

Fleming and Baum (1985) compare levels of stress in two communities, in which one community was the second most dangerous waste site in the country while the other was located far from any known hazards. Results show that exposed residents in hazardous communities experience higher stress levels than residents in control areas. These findings were supported by Gibbs's research in Legler. "Although many individuals in

the litigation group may be well adjusted, nevertheless the proportion of individuals with serious psychological problems is much higher than one would expect in a comparable group which had not undergone the same stress" (Gibbs, 1983, p. 89). The researcher believes that the psychological consequences remained two years after most of the stresses occurred. The presence of serious psychological symptoms two years after the incident reflects the power, the pervasiveness and long-term nature of the stress experience. Furthermore, Gibbs (1982) argues that depression and other psychopathologies result from a loss of control caused by environmental stress. Residents of the landfill neighborhood reported experiencing more bothersome symptoms, such as somatic complaints, depression, and anxiety, than did residents of the comparison group.

These findings suggest that residents of the landfill neighborhood had more difficulty concentrating and/or motivating themselves to work on a task and experienced greater stress related arousal of the sympathetic nervous system. There was also some evidence that feelings of uncertainty were associated with elevations on emotionality stress measures. Findings concerning the role of helplessness were stronger. Feelings of helplessness were significantly correlated with stress across self-report, performance and biochemical domains. People who reported more feelings of helplessness showed higher levels of stress than did people who reported lower feelings of helplessness (Fleming et al., 1991).

These results support the hypothesis that potential exposure to hazardous substances may create feelings of helplessness that in turn may contribute to stress. Evidence also suggests that feelings of uncertainty are associated with feelings of helplessness. In general, the subjects in the study believed that toxic waste sites are dangerous and that they pose a threat to health. Exposure to toxic waste is not a rare occurrence; people in hundreds of communities have recently

discovered that they may have been exposed to toxic chemicals simply by living in their homes, digging in their yards, and drinking well water. As the long term consequences of modest elevations in stress are currently unknown, it is difficult to determine the true consequences of these evaluations. However, there is some evidence linking chronic stress to both psychological and physiological disorders (Baum, Singer & Baum, 1983).

Mental Health and Exposure to Toxic Chemicals

A few studies examine possible links between air pollution and mental health. Case studies suggest an association between indoor air pollutants (e.g., lead, solvents, formaldehyde) and various behavioral abnormalities including somnolence, irritability, psychomotor dysfunctioning, and depression (Randolph, 1970; Weiss, 1983). Correlations between ambient pollutants and psychiatric admissions were found in a number of studies. Brier, Downes, and Brier, (1983) found evidence for their hypothesis that one or more recent stressful life events will increase individual risk for negative mental health reactions to ambient air pollution. This study calls attention to the potential role of the physical environment in causing psychological strain.

Edelstein (1982) presents findings of the psychopathological impact of toxic exposure. These findings indicate that social movement activists who feel more in control of their experiences than non-activists are less susceptible to the following symptoms:
1. Personal changes that include bad habits which indicate behavioral manifestations of stress (e.g. increases in smoking, nervous eating and insomnia); 2. Dreams about pollution; 3. Changes in temperament reflecting increased irritability; 4. Defensiveness in social relationships such as an inability to relax with others and a paranoid suspicion of others' motives; 5. Depression characterized as a loss of motivation and lethargy; and 6. Guilt and self blame, not for causing the

situation, but for getting themselves into it and staying there. (Edelstein, p. 91)

Coping with The Impact of Toxic Exposure

Dealing with stress becomes necessary for people exposed to toxic chemicals. Beside coping with the stressful events represented by contaminated water resources, people must deal with the secondary effects of stress. Coping with stress mainly involves three strategies; (1) confronting the "source of stress" problem in an attempt to master it; (2) denial; or (3) reacting emotionally to the symptoms of stress. Research has shown that denial might provide short-term relief, but it does not help in resolving existing stress that might be difficult to handle in the long run. Although confrontation of the source of stress requires personal abilities and energy, it represents the most logical and practical solution to stress, especially in the case of the pollution of water resources. In the general sense, social activism represents a positive response that helps in confronting source of stress.

Edelstein (1988) indicates that ambiguity and uncertainty are characteristics of the problem. When practical difficulty to observe or identify the toxic contamination level exists, the situation is capable of being construed in varied contradictory ways. Scientists have summarized some of the common behaviors utilized by people as ways of resolving the stressful situation and finding a way out of inner conflict. These strategies include the following. 1. Communication strategies that involve engaging in discussion with others about many issues in order to manage stress. Some people make jokes to relieve their own pressure; 2. Social escape which is viewed as another stress management strategy in which people become involved in different social activities as a means of relaxation; 3. Adopting the helper role is an active coping technique that involves escaping into the situation by assisting others in dealing with the crisis; 4. Keeping a positive

attitude is the last technique that involves cognitive adjustment. This technique illustrates the acceptance of circumstances beyond the person's control.

Successful coping often depends on the supportiveness of one's mate. In most relationships, coping with toxic exposure involves a mix of destabilizing and stabilizing characteristics (Edelstein, 1983). In combination with other stresses confronting affected couples, toxic exposure adds tension that may contribute to the dissolution of some relationships. Symptoms of marital conflict as a result of the tension created by toxic exposure include blaming a mate for the decision to move to the community and distraction from supportive participation where one spouse loses interest in joint activities formerly important to the relationship.

Pressures to become active in community organizations also cause stress for couples. For a family to be represented and informed, some involvement is demanded by least one mate. This new role invites various tensions. In other cases, one mate resents the other's activism. In families of the board members of the Concerned Citizens Group, marital strife resulted from the immersion of one spouse in a leadership role in the community group. (Edelstein, 1988). Tension stemmed from the continual absence of the activist mate, the constant intrusions upon the home as it became a key link in the community's communications network, and the pressure and stress brought to their homes. Edelstein believes that stress resulting from toxic exposure is a powerful force for personal change. On the other hand, even in the face of positive growth, coping with the stress from exposure has caused serious and long-term psychological damage to couples.

Positive growth may also occur as a result of the effective and assertive coping that characterizes activism (Stone and Levine 1985). Mastery of the exposure situation requires innovation outside the normal repertoire of behavior and the normal boundaries of thought. Rather than

merely acting in the tried-and-true ways necessary to maintain the status quo, toxic activists adopt an assertive approach to coping that involves making new relationships and finding new solutions (Botkin, Elmandrjo and Malitza, 1979).

The result is an opportunity for learning and growth, albeit often in the sense of the cliche "learning the hard way" (Stone et al., p. 87). Competence and confidence are simultaneously the prerequisites and benefits of such coping. While the Legler experience was generally negative, many residents experienced impressive personal growth. A significant percentage learned to be assertive in fighting for their interests. The leaders of the Concerned Citizen Committee were particularly effective in guiding the community's coping response. For the leaders and involved members, activism had not have been part of their normal lives, but it became essential for effective coping.

Furthermore, finding themselves in a situation where they were forced to express themselves, residents learned that it was legitimate for them to show their anger. Expressing their feelings was now an acceptable alternative to hiding their feelings. Residents gained self confidence through their involvement in the whole experience. The most prominent role model, Lois Gibbs is now founder and leader of the Citizens Clearinghouse for Hazardous Waste. Her transition from housewife to the talented and effective leader of the Love Canal Homeowners' Association has been chronicled in a television movie (Gibbs, 1982; Levine, 1982).

Not all the Legler couples experienced relationship problems during this time. Several factors contributed to stability such as: lifestyle factors, coping style, and increased confidence. Within the context of toxic exposure experience, the most stable couples tended to be elderly, having the experience of a long marriage to help mitigate problems. Stable couples had lived in the community longer, avoiding the adjustments of moving, owning a first home, having young children and handling all of the other pressures that confronted the young couples who

were newly arrived. The likelihood of tension between spouses is influenced by the couple's coping style. A "laid-back" approach to dealing with stress was common among couples who avoided relationship problems. The water crisis brought a closeness to some couples that comes only from working through difficulties.

Horowitz and Stefanko (1989) state that stress effects that surround an environmental hazard are characterized as being chronic, nonurgent, physically perceivable, and apparently intractable to the individual. Campbell defines this type of stressor as an ambient stressor, mediated by perceived control, amount and quality of information about the stressor, and duration, and constraints.

Environmental Awareness

The question of who is concerned with the environment has been examined in a number of studies. Research indicates that responsibility about the environment should include every system in the society (Straays and Meek, 1972). Studies of the personality profiles of environmentally concerned individuals indicate that they have some personality attributes different from non-concerned individuals. Environmentally concerned individuals tend to be more liberal in sociopolitical orientation, younger, and better educated than persons who were less concerned about ecological issues (Tognacci, et al., 1972).

Other studies have found a strong linkage between selected demographic characteristics such as age, race, and socioeconomic levels and environmental awareness (Weigel and Weigel, 1978). Ideological perspective is considered an essential determinant of people's awareness of the environment (Dunlap and Gale, 1972; Walsh and Warland, 1983).

Social Support

Social support is defined as information leading the subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations (Cobb, 1976 p. 300). Most social researchers believe that social support is a moderator variable that can reduce or buffer the impact of stressful situations or minimize their impact on people's lives. Rankin (1991) argues that social support is a multidimensional construct that can be conceptualized in numerous ways. However, adequate social support is not only perceived as a buffering variable, but also as an effective process that protects people's lives in times of crisis. "It would not be unreasonable to suppose that esteem support would encourage a person to cope, to get out and attempt to master a problem. Likewise, emotional support and a sense of belonging might provide the climate in which self-identity changes can most readily take place" (Cobb, 1976 p. 311).

Social support has been examined in the literature in terms of source and type of support. Source of support includes many levels, as Rankin et al., (1991) state, from individual support provided by family members to neighbors, and the community. Thoits (1986) suggests that the most effective and beneficial social support may be from individuals facing similar stressors. Coates and Worthman (1980) indicate that attempted assistance from dissimilar others may be considered as controlling and demanding. These studies argue that psychological ties between the source of support and the recipient are important factors that influence the quality of supportive interactions.

Social support can be generated from formal sources (e.g. community agencies, local governments, and other non-profit organizations) or informal sources from the social networks available within the community (Kahan and Antonucci, 1980). Rankin and Monahan define perceived support as "the amount of social support an individual believes is actually available and the degree of satisfaction with this support" (1991, p.

297). Perceived support appears to provide a more sensitive prediction of adjustment to stressful life events (Wethington and Kessler, 1986).

Presently, there are two main models for understanding the relationship between social support and psychological outcomes. The direct effect model suggests the positive effects of social support, regardless of whether a person is under stress or not. The model assumes that social support networks provide rewarding experiences that promote positive affect, self esteem, and positive emotional effects. In contrast, the buffering model of social support is related to a stress and coping framework. In this model, social support alleviates the impact of stress through a number of mechanisms such as reducing the importance of a problem or providing solutions to problems (Cohen and Wills, 1985).

Social support is a critical factor in determining a family's responses to environmental disasters. A review of the literature confirms the importance of social support within the family system (Brown and Harris, 1978). Received social support can be defined as a process of strengthening and providing the system with more resources in order to overcome undesirable events. Lazarus (1984) states that "social support refers to the nature of the interactions occurring in social relationships especially how these are evaluated by the person as to their supportiveness" (Lazarus, 1984, p. 249). Burge and Figley (1982) found that among a diverse group of people, family members were most often cited as those to whom one would turn in times of need. In another study, Figley (1983) identifies types of support that a family might seek in order to face stressful events including emotional support, encouragement, advice and companionship.

The Cultural Meanings of Exposure To Toxic Chemicals

Fitchen (1989) shifts attention to other effects of toxic chemical pollution on people's lives. He found that invasion by toxic chemicals

of the residential environment represents an attack on important cultural institutions of home and homeownership. Fitchen shows the linkage between chemical contamination and the basic values and assumptions inherent in the American culture. To explore American assumptions and values in relation to toxic chemicals, a multi-disciplinary research project combined the knowledge and skills of professionals from toxicology, chemistry, biochemistry, hydrology, water resource management and social science. The team's objective was to study actual instances in which toxic chemicals had been found in the groundwater supplying public water systems and/or private wells. A dozen communities in New York state were chosen on the basis of similarities in their water contamination problems. Members of the research team tracked the various facets of the situation at the different sites, including: the issue of health risks; the chemical investigation being conducted; the development of plans for mediation and the decisions, actions, and interactions of the various federal, state, and local personnel involved with each site.

This comprehensive and people-oriented approach provides insights that are being used in developing materials to assist communities, government agencies, and technical experts in dealing more effectively with this increasingly common sort of pollution. Fitchen found that differences among communities in response to pollution of water resources pertains not only to differences in contamination factors and health risk, but are also associated with certain factors in the local context, such as trust in local government and attitudes towards the presumed polluter (1989: p. 315).

Fitchen believes that contamination of water resources contradicts the basic value of the home as a safe place to satisfy the basic needs of family members. In every community that participated in the study, residents expressed their concerns about contamination in the context of family. During the process of community responses, family members were present, including children and older members. "The image of the home

as a refuge from dangers of the outside world has deep historical roots in the American culture. Accordingly, if toxic chemicals were discovered in residential environments, we might expect that people's reactions would be affected by their perceived loss of security" (Fitchen, 1989 p. 316). One of the most significant findings in Fitchen's study was that the presence of toxic chemicals in the family home represents a challenge to the dominant belief that home is a place for protection.

The American cultural attachment to the single-family home makes the ownership of a home a very special case. Economically, home-ownership is considered as an important aspect of American culture, and it also carries significant social meanings. First, homeownership is a part of the American dream. This value reflects the meaning of life achievement as a test of reality. Toxic contamination of owner-occupied residences shatters one component of the American dream. People have a specific concern regarding the devaluation of their properties, the reduced market value of their homes and possible difficulty in selling or renting their properties. The effect of this new reality is not only a financial matter but is also tied to the concept of the residents' social mobility. As Fitchen states, the owner of the home becomes the owner of a problem.

A second social meaning is that homeownership is thought to promote independence and confer rights. This meaning of homeownership reflects the culturally valued attribute of independence. Accordingly, as Fitchen argues, toxic contamination of the home represents the loss of independence. In this context, the concept of independence does not merely mean economic independence, but also suggests independence from relying on others.

Finally, homeownership makes one a "Homeowner," a member of a respected social class. There is an implicit assumption that homeownership is linked to good citizenship. The assumption is based on a cultural value that associates homeownership to success in life. Another interpretation is the idea that when people own homes, they gain

freedom to work hard in their homes. But "when toxic contamination threatens the homes for and which people have worked as hard, it represents a devaluation of the culturally prescribed work effort" (Fitchen, 1989 p. 320).

Fitchen's study adds to the literature an important dimension that reflects how toxic chemicals challenge the dominant moral and cognitive values inherent in the American society. This new threat questions the assumptions people have about themselves and about the way life is supposed to be. Home is the place for the family; any attack on it is an attack on the family, not just literally, in terms of exposure to toxic chemicals, but symbolically as well. As Fitchen explains, "When toxic contaminants enter a home, the sanctity, security, and privacy of home are violated, and the identity of its residents is tarnished. Chemical contamination of the home is thus an invasion" (1989: 320). In fact, people view toxic chemical contamination as an entity, and speak about it in the physical sense as an intruder in their lives

> When toxic chemicals enter a residential area, they behave like unsocialized people; they are unaware of accepted conventions of society. They enter the yard, the air, or water of any home in the neighborhood without requesting permission or announcing their presence. Toxic chemicals act like outlaws, violating a basic premise of the society, private property rights. They ignore property boundaries" (Fitchen, p. 321)

When contamination assumes a symbolic meaning for people, such as home or river, it becomes caught up in sensitive personal feelings. People could be so emotionally attached to this symbol with which they live that they view the risk endangering it as a risk to their very existence. As Fitchen puts it, "people are not only responding to the polluting chemicals, but also to their special feelings about the particular environment that has been polluted. The effects upon people will be greater than could be explained merely by the (facts) of actual or projected health problems or financial costs" (1989: 321).

The question of who is responsible and who is going to provide compensation seems to be the main concern for the government and

congressional committees. To be clear about the issue, we might say that most of the regulations regarding the environment are intended to cool down the public rather than to identify and punish those responsible for the contamination. Another important contribution of the Love Canal study was its ability to prove the absence of environmental policy. Furthermore, the existing environmental regulations were susceptible to a manipulative process that hindered the application of regulations through budget cuts and delaying tactics.

Fitchen questions governmental responses to environmental disasters.

> In general, official response does not show much sensitivity to the cultural values and ideas that are particularly relevant in residential environments. If instead these specialists were encouraged to see environmental pollution more holistically as a human problem involving human beings and their culturally shaped perceptions, their ability to respond sensitively to local contamination incidents would be greatly enhanced. If they were more aware of cultural factors, such as-but not limited to-the concept of home, they would understand what is really happening to people when toxic chemicals enter their lives. (Fitchen, p. 321)

In every case of environmental contamination, a number of agencies are involved in the process of assessing the level of pollution and determining the appropriate actions. As Fitchen indicates, the problem of contamination is becoming more common and those officials who are supposed to take measures to protect the environment must be aware of the cultural factors attached to the problem. These cultural factors include the concept of the home and the changes in people's lives. It is important for these officials to know more about cultural meanings and the cultural shaping of people's perceptions of the risk connected with pollution.

Community and Family Activism

Most studies of community response to environmental disasters agree that community involvement in the process is essential for the achievement of positive outcomes. In the earliest stages of discovery,

people might be uncertain about the cause, magnitude and effect of environmental pollution. The understanding and the development of a clear definition of the problem is critical in shaping community response. But, since there are no environmental policies that aim for the protection of human life, the issue of community involvement represents a major factor in fighting the contamination. Accordingly, community activism is a process that determines and shapes the people's perceptions, attitudes, and responses toward the perilous situation of the pollution of their physical environment.

Community activism consists of a level of collective grievances that a number of residents in the community experience at the same time. Once families in the community realize the impact of such pollution on their lives, the nature of response is determined by many factors. But most studies of environmental and community activism have viewed these factors only from one or two angles. For example, Russell and Levine (1985) investigated differences in social characteristics between activist and non-activist families. The study indicates significant differences in personal perceptions between activist and non-activist families. Activist families were found to be satisfied with their effort in affecting the government decision-making process.

In the Love Canal experience, activists relied on government and crisis-related organizations for help, while non-activists relied more on family support. Findings reveal that activist families experienced personal changes from their effort. Differences in family and community responses have been viewed from a very limited perspective. The importance of having a clear definition of the problem was seen by Quarantelli et al., (1977) as the most important determinant of community activism. Stone et al., (1985) concentrate on variation in some personal and interpersonal characteristics of activist versus non-activist individuals. "To be active meant that individually, or in concert with others, the person went beyond simply belonging to one citizens'

organization, or attending an occasional public meeting, called by a citizens' group or by a governmental agency. The person became involved in altering the situation, through one or more activities" (Stone et al., 1985, p. 159).

Other research considers response to environmental disasters as a process that was reflected in the emergence of collective perception within the community. Quarantelli and Dynes (1977) define disasters, where there is no clear definition of the problem and the best way to solve it, as conditions of "descensus" that add to individual and group stress because the appropriate behaviors and priorities for action are not fully shared by community members. This introduction leads to the notion of shared perceptions within the community. Without such consensus among families and members in the community, no action can be expected.

Some researchers continue to examine the characteristics that differentiate activist and non-activist families, hoping to draw some inferences on factors that enhance and facilitate community responses. Although those researchers acknowledge the difficulties and the consequences that activists experience in the process of protest, most findings show that social activism represents a positive solution to life threatening events. Dohrenwend (1978) has referred to family activism as training to develop a high level of ability to face and solve complex social and emotional problems, as a means of mediating stressful life events.

In the case of community involvement in toxic chemical situations Levine (1982) describes how the core group:

> educated themselves about toxic chemicals, about pertinent local and national laws of waste disposal, and about political process. They did health survey, and developed some sophistication in understanding what constitutes good science. They educated themselves and spread their message to others by speeches-locally and in other parts of the country-by telephone calls, and by interviews with the press. They answered all letters. They kept a register of residents, maintained clipping files, wrote a chronology, knew a great deal about every family that belonged to the

> association. Most important, they absorbed and retained everything possible about the details and progress of their cause. They attended all public meetings remotely connected with their interests, testified before investigatory bodies, and exchanged information with other groups that had similar problems. (They) kept in constant touch with all electe political figures who could help them in any way at all ...(They) provided a constant presence; they persisted; they were always there (Levine, 1982, pp. 188-9)

This eloquent description of social activism within a community explains, not only the process and the rules of engagement in community activism, but shows that such work is deliberate effort requiring a high level of commitment and self motivation.

In studying the psychological profile of activist families in the face of a health hazards situation, Stone et al., (1985) find that activist citizens tend to be relatively young homeowners who are the parents of young children and have more education and higher incomes than non- activists. In the Love Canal incident, most residents acknowledged the existence of the problem and they were concerned about their health. They also experienced anxiety and financial problems regarding their properties. But one clear distinction between activist and non-activist was the level of concern. Activists were more likely to feel their health problems had grown worse and their homes were unsafe. The activist group experienced changes in their behavior and relationships as a result of their activism and they felt better about themselves and their families than did non-activists (Stone and Levine, 1985).

Many researchers have found that involvement in activism produces different types of stress that relate to involvement in a new experience, with unexpected changes and results in the process. But studies of community activism suggest that activist families benefit from such experiences. People who are adjusting to threatening life events achieve three goals: they find meaning in the experience; they gain a sense of mastery over the event and over their lives; and they restore their own self-esteem. (Taylor, 1983).

Non-activist members of the community have not thoroughly identified

the different strategies they must utilize to cope with stress. The literature describes this group as older, longer-time residents or retirees, with less education and lower incomes. Walsh and Warlend (1983) identified a group of citizens as "free riders" who benefitted from the work of activists at Three Mile Island. These community members are less motivated and have no clear vision of the existing problem. However, when the benefits of the hard work of the activists begin to appear they joined the crowd.

The final group consists of community members who deny the existence of the disaster or minimize its effect. In some cases, this denial group believes that the entire environmental event is "the product of fevered imaginations on the part of every one involved except themselves" (Stone and Levine, p. 176). The relationships within the community between activists and non-activists has not been examined thoroughly. One could speculate that a non-activist group could follow one of three directions: not participating in events, but becoming sensitive and supportive to the entire situation; denying the existence of the problem and using a wait and see tactic or; becoming unsupportive to the community effort by ridiculing the activists or participating in counter-movement activities.

Most researchers that have thoroughly investigated communities' responses to environmental hazards have adopted a field methodology. Field work research has been found to be effective in reflecting the reality of a community facing environmental threat. Cable and Walsh (1991) investigated differences in two communities' responses to hazardous environmental situations created by industry. In the Yellow Creek Valley of Kentucky, there had been a long history of industrial pollution caused by a tannery's discharge of effluent into the small creek. Cable et al., found a history of residents' complaints against the industry, but they had always been ignored. City and industry officials continued their resistance to people's protest, asking "what

is so important about few dead crap?"

People in the community were frustrated not only by the company's response; the legal process was also unresponsive. In 1953, a lawsuit against the tanning company was dismissed even before the plaintiffs' witnesses were heard (Cable et al., 1989). Cable et al., identified two reasons for the lack of mobilization within the community. First, cultural balkanization, the fragmented structure of the community, inhibited the emergence of collective grievances. The second reason pertains to the company's manipulation of the political process through different strategies. The most obvious was the strong presence of company officials on the City Council assuring strong support for the company.

Cable et al., indicate that structural change within the community was an important precondition for the emergence of social protest. At the national level, growing interest in resolving environmental problems legitimated environmental grievances. At the local level, divisions within the community were reduced by the establishment of consolidated schools that gathered students from different communities. Community protest was finally organized under the auspices of Yellow Creek Concerned Citizens, (YCCC) formed in 1980.

Movement researchers have documented that SMOs with similar concerns can help to shape a collective definition of the problem. Accordingly, pre-existing SMOs could be crucial in providing a blueprint for organizing and defining an ideology that frames the grievance. Cable et al., indicate that such organizations may be necessary for a population that has little history of protest activity. Another important finding in Cable et al.,'s study was the issue of availability of resources. Middle class citizens typically have greater access to the resources necessary for social protest, including money, flexible time schedules, and, most importantly, resourceful actors. Since environmental contamination disproportionately affects poor communities, the scarcity

of resources is difficult to ignore.

Morrison (1986) indicates a new grassroots environmental movement arising from the direct impact of environmental pollution. This new movement is characterized by activists of lower socioeconomic status. Generally, people of lower socieconomic status are less likely to participate in social movement activities than those of higher social classes. Contamination disproportional affect the lower classes. Concerned about health threats, working class communities mobilized for survival.

The literature on preexisting conditions essential for the emergence of SMOs indicates that the emergence of local grassroots organizations plays a key role in positive coping with the demands of toxic exposure (Edelstein, et al., 1987). Fowlkes and Miller (1987) find that community perception of an existing environmental threat varies because of a number of factors. This fact suggests that the impact of a citizens group on the community could take either the form of conflict or cohesion (Quarantelli and Dynes, 1977; Edelstein and Wanderman, 1987).

Krauss (1989) argues that participation in a social movement provides community members with the chance to become critical of existing political arrangements and to develop an active participating concept of democracy. At the individual level, this process is called alteration. Cable and Degutis refer to the equivalent process at the community level as "the transformation of community consciousness" (1991, p. 4).

Transformation of community consciousness evolves three factors:

1. The degree of pre-mobilization integration of the community.
2. The presence of economic constraints made salient by the mobilization issue.
3. The extent to which the issue cuts across existing political cleavages (Cable et al., 1991, p. 22)

Pre-mobilization integration of the community refers to the sense of community togetherness and solidarity residents feel prior to mobilization. Cable et al., state that the lower the pre-mobilization

community solidarity, the greater the chance of mobilization increasing it. The impact of dependency on the source of the disaster is referred to as the presence of economic constraints might hinder the community's ability for mobilization. In some cases, it might create a conflict between two community groups because one is economically dependent on the source of the disaster while the other group has no such ties. Accordingly, different perceptions of risk could lead to inner conflict on strategies within the community.

Political cleavage as Cable et al., describe it can facilitate or inhibit mobilization within the community. "If the mobilization issue has the effect of reinforcing old patterns, the community conflict is likely to decrease. On the other hand, the more the mobilization issue creates cross-cutting political cleavages, the more likely that the SMO will increase community conflict" (Cable et al., 1991)

✓ Based on the review of the literature of different studies that investigate the impact of toxic exposure on people's lives, I intend to integrate this knowledge into a comprehensive theory that will provide in- depth understanding of this social phenomenon under study. In the next chapter, a study model will be introduced to explain the dynamics of environmental disasters and their impact.

CHAPTER IV

THE STUDY MODEL AND HYPOTHESES

To examine family responses to chronic technical disasters, an integrative approach will be utilized to include an array of variables that affect the development of an active role within the family or outside its structure. The conceptual framework of the study identifies a new set of variables that are connected theoretically to emphasize the major themes of the study. A study model is developed (Figure 3) to help investigate the direct and indirect relationships among the study variables.

The model is based on the assumption that organizing as a response to environmental disasters represents a healthy and positive family coping strategy that aims to protect the family from suffering negative consequences. Another assumption of the study is that families vary in their perception of the environment, their evaluation of a potential risk and their responses to such risk. This model will help in understanding the internal affairs of the family to discover the factors that influence family response to environmental disasters.

Definition of the Study Variables

Based on the theoretical framework adopted by this study, a number of variables are selected to explain the variation in the dependent variables. Independent variables are defined conceptualized to understand the nature of the relationships among these variables as well as their effect on the dependent variable. The review of the literature provided the practical explanation of these variables and the way they were conceptualized in previous studies.

Family Response: The Dependent Variable

The dependent variable in the study, family response (Figure 4), involves two levels of family response to environmental disasters -- in this study the contamination of water resources. Earlier, I explained that since families perceive environmental disasters differently, responses to such events vary from one family to another. In this study, variables that influence family response are investigated to find out which variables can best predict positive or negative response. McCubbin and Patterson (1983) explain in the double ABCX model that these responses can be considered either as adaptive (positive response), or maladaptive response (negative response).

In this study, positive response is characterized by specific sets of behaviors that reflect families' interests in recognizing and acting upon stressful life events, aiming for the reverse of these conditions. In adopting such behaviors, the family goal is to protect its well-being from adverse impacts. Consequently, positive responses include: acknowledgement of the problem; expression of concern regarding the problem; taking more concurrent actions such as attending public meetings; participation in legal actions; participation in social protest; joining a SMO that is formed for the cause of fighting the contamination of the community water resources; and adoption of a leadership position in the SMO. It should be noted that these responses require deliberate and intentional efforts. Research has found out that sometimes these efforts represent another burden for the family.

Negative or maladaptive responses involve different levels, ranging from denial of the problem to involvement in a countermovement that aims to challenge the community's effort to fight the pollution. Studies found that negative responses could take the form of denial, loss of interest, apathy, or the adoption of a wait-and-see strategy (the free rider).

Family Functioning and Relationships

The purpose of the study is to explore factors that influence a family to respond positively to environmental disasters. By examining the level of family functioning, the study takes a careful look at the internal affairs of the family that could affect its ability to respond to outside threat. A family with a high level of cohesion will be more able to perceive activities that would jeopardize its stability. Members in such a family are more willing to react together to prevent such threats by adopting adequate and effective coping mechanisms. On the other hand, a family that is disengaged will lose the sense of togetherness and the perception of family survival. Members in such a family are interested in their own individual interests and their feelings towards family survival would be minimal. Accordingly, members have no interest in utilizing positive coping mechanisms to protect the family from outside threats.

The family system perspective views the family as a set of interrelated parts. The relationships among parts in the family system are the relationships among family members. The purpose of the family relationships is to maintain the family functioning through communication. The issue of interdependence among family members refers to the levels of support and availability among family members to help the family achieve its goals. The relevancy of such issues to this study stems from the view that, in order for a family member to become effective in activities related to environmental advocacy, he/she needs adequate support and encouragement from the family as a unit. Accordingly, this variable could be seen as family interrelationships that aim to enhance the effectiveness, mutual understanding and managerial efficacy within the family as a system.

Family Structure and Demographics

These variables refer to the impact of the family structure on its

ability to respond to an environmental threat. In this study, several family structures are considered: a) families with both parents and children living at home; b) families with grown children no longer at home; c) single parent families; d) families with relatives living at home. It is expected that families with children will be much more responsive to environmental disaster than families with no children.

Demographic factors refer to a number of variables such as the age of the parents, the average income of the family, level of education, race, and religion. These variables might have an impact on the way people perceive an environmental disaster and their attitudes in general towards such issues.

Stress and Family Coping Strategies

One of the assumptions in this study is that stress is interpreted differently by people, so that responses to stress vary from individual to individual and from one family to another. The term stress has been defined by Lazarus as "some stimulus condition that results in disequilibrium in the system and produces a dynamic kind of strain, that is, changes in the system against which mechanisms of equilibrium are activated" (Lazarus, 1966, P. 12). Family social scientists have attempted to link stress to family theories. This linkage is considered in the light of understanding the family as a system in terms of the interconnectedness of its members.

This perspective argues that what affects one person in the family affects the others to some degree, that a change in any part of the system requires some adjustment in the whole system. Family stress, as distinct from a stressor, is defined as a state of tension that arises from an actual or perceived demand, calling for adjustment or adaptive behavior. Consequently, distress is defined as stress that is perceived as unpleasant or undesirable by the member(s) of the family (Olson et al., 1983 p. 120).

Edelstein (1988) indicates that stress is not solely the property of the individual; it occurs at every level of social process, affecting family, relational, institutional, community and societal dynamics as well. The idea of considering stress in regard to the various systems is supported in a number of studies. Bachrach and Zautra (1985) address stress in relation to community: "community stressors refer to problems that affect a large number of people in a given area. Typically, these problems cannot be rapidly resolved by the individual alone and thus require collective action" (1985, p. 127).

Social Support

Significant evidence comes from studies investigating perceived social support as a process of strengthening and providing the system with more resources in order to overcome undesirable events. "Social support refers to the nature of the interactions occurring in social relationships especially how these are evaluated by persons as to their supportiveness" (Lazarus, et al., 1984 p. 249).

Interest in this variable derives from the notion that a stressful life event could require the mobilization of resources that might be beyond the family's ability to offer. For this reason the identification of internal resources within the family and the process through which the family could enhance its resources are of great importance. Similarly, any support perceived from the other systems in the environment might provide significant help for the family to deal with existing threats.

A family that experiences a stressful life event represented in the recognition of environmental disaster is also facing a set of consequences. Moving from home, the threat of sickness, feeling victimized, alienation, and stigmatization by the outside world are some pressures that require collective efforts. Social support can be categorized as internal or external support. To a family that is considering a coping strategy to deal with environmental disaster,

internal support means the process through which the family becomes more flexible and ready for change. Interdependency means that the parts of the system are so interrelated as to be dependent upon each other for their functioning. When one family member decides to become actively involved in a community effort that aims to resist the toxic dump in the community, s/he needs support and understanding from other family members.

Types of social support include emotional, tangible, and informational. Emotional support include attachment, reassurance, and being able to rely on and confide in a person. Emotional support contributes to feelings that one is loved and cared about. Tangible support involves direct aid such as loans or gifts, and services such as taking care of someone who is ill, doing a job or chore. Informational support provides information or advice, and gives feedback about how a person is doing (Lazarus, et al., 1984).

External social support represents the efforts, information, and services that the family receives from other systems in the environment. This type of social support is critical for the family and the community. However, in many instances, it is difficult to obtain. For example, officials are typically reluctant to provide families and communities with information that might be used against the system. External social support could be seen at Love Canal in the communication among families, letters of support, visits, and baby sitting offers from neighbors. Social support is critical in the process of social movement participation but has yet to be thoroughly studied.

Socioeconomic Status

Socioeconomic status (SES) represents a cluster of variables describing the social and economic conditions of a particular group of subjects. For the purpose of this study, SES is considered as an independent variable that has an impact on the dependent variable, family

responses to toxic waste problems. It is assumed that family responses to toxic waste disaster are critically influenced by its economic and financial condition. Fowlkes and Miller (1987) addressed the sociocultural factors that determine participation in social movements. Research in social movement participation has viewed resource availability as an important predictor for the emergence of social movements. It can be assumed that a family that faces poverty will be overwhelmingly concerned with trying to acquire basic needs for survival. That might hinder its ability to worry about the external problems represented by the pollution of water resources.

Level of education is another variable that might have an impact on family responses. Research on environmental awareness indicates that level of education correlates highly with individual's attitudes toward the environment. Involvement in issues concerning the environment might require a minimum level of educational background to understand some of the scientific facts. Also, level of education is associated with level of income, another important indicator of movement participation. In order for people to follow particular issues that relate to community problems, gaining access to information is essential, and it might be difficult for people who can not read or write to perform such a task.

Risk Perception

Risk studies agree that the concept of "risk" means different things to different people. There is a significant difference between experts and ordinary people in their views of risk. "Lay people can assess annual fatalities if they are asked to. However, their judgements of "risk" are sensitive to other factors as well (e. g. catastrophic potential, threat to future generations" (Slovic, Fischhoff, and Lichtenstein, 1986). For the purpose of this study, risk perception refers to people's attitudes toward specific environmental hazards and the value judgements they make of such hazards as stressful factors that could influence their lives in

a negative sense.

Environmental Awareness

People are different in the way they view the environment. Concern about the environment varies from one individual to another. There are a number of variables that affect people's attitudes toward the environment. In this study, it is assumed that a family with a high level of concern about the environment will be more willing to take positive actions against any activities that are perceived as a threat to the environment. Environmental awareness refers to people's attitudes, beliefs and feelings about the environment in general and about the degradation of its quality as a result of environmental threats such as pollution.

Sense of Community

This variable assesses the way people feel about their community. It includes emotional and conceptual perceptions of the quality of life in the community. People with strong attachments to the community will perceive their community as a highly important symbol in their lives. A sense of pride in the community is a natural reflection of people's feelings and the way they value their community. Accordingly, any changes in the physical features of the community have specific effects on residents' perceptions. Disaster research has concentrated on the peoples' responses to natural or technological disasters. It has been found that residents' feelings and attitudes toward their community are influenced by the amount of damage caused by the disaster (Erikson, 1976 ; Levine, 1982; Cable et al., 1991; and Edelstein, 1984).

The Structural Variables

Resource mobilization approaches strongly emphasize the availability of resources as an important factor for the emergence and continuation

of SMO. Aside from funding resources, the approach considers the availability of time as a resource. This view assumes that people who have time or who can volunteer some of their time for helping the cause of their family and community are more likely to be involved in the SMO. In this study, I consider experience in meaningful social activity in the community as an essential resource that a family can utilize in fighting the environmental threat. Past and present experience as a member in a number of community groups provides the individual with interpersonal and social skills and knowledge that are critical for the SMO work. This variable will be called social involvement and will be identified as: family members' personal experiences in social activities that enhance the ability to acquire the personal, interpersonal, and social skills necessary for personal and family growth.

Study Hypotheses

The following are exploratory hypotheses. They will not be tested directly, but will rather, guide the research effort.

General Hypotheses

1. A high level of stress is the common dominator in the psychological profile of families that experience contamination of water resources; 2. families which suffer from the pollution of water resources experience disappointment, frustration, loss of trust and uncertainty as a result of the failure of the system to support their cause; 3. families that suffer from the pollution of water resources experience fears of future health consequences; 4. pollution of water resources causes widespread economic, social and psychological effects for families and communities; 5. lack of resources hinder family's ability to become involved in community problems.

Specific Hypotheses

1. A family that has strong relationships will adopt positive responses to environmental stress; 2. demographic variables such as education and income correlate positively with positive family responses to environmental stress; 3. families with young children or young families have higher risk perceptions than families with no children or grown children; 4. level of satisfaction with quality of life in a polluted community correlates negatively with positive family response; 5. risk perception correlates positively with level of stress; 6. the activist family has higher level of environmental awareness than the non-activist family; 7. structural variables (time-labor-social involvement) correlate positively with positive family response to environmental stress; 8. level of social support correlates with family response.

CHAPTER V

METHODOLOGY

Studies of the impact of environmental disasters on communities typically involve rigorous qualitative methods. To assess the magnitude of the impact from environmental disasters on individuals, families, and communities, researchers have spent a significant amount of time visiting disaster sites and collecting information about the cause of the disaster. Researchers have reviewed historical documents, scientific reports, and news articles to help them gain greater insight into an incident. Researchers in the field can observe the impact directly, recording the event's effects as they emerge and develop.

Various environmental studies have utilized nonparticipant observation strategies (Edelstein, 1988; Levine, 1982; Erikson, 1976; and Cable, 1991). Researchers attend group meetings or community meetings to observe the dynamics and record the discussion. Such qualitative methods are essential in the development of an analytical procedure for interpretation. Field research is a deliberate attempt to understand a phenomenon based on its development in a theoretical framework for interpreting the behavior in specific setting. For example, as the researcher observes the community action, he/she might incorporate a conflict or a power perspective. A more in-depth study would require a return trip to read about activist dynamics to find a theoretical underpinning for analysis. Only involvement with the community allows the researcher to find a continuous development of theoretical premises that enable him/her to capture, understand, and interpret the social reality.

Field work research is also the study of social phenomena in their natural settings. The adoption of quantitative methods is in shedding light on specific issues and making them more understandable. Quantitative methods provide another strong tool for a more in-depth

explanation of a particular point. In this study, I argue that the combination of qualitative and quantitative provides an especially strong methodological scheme for observing and explaining social phenomena.

In this study, I use qualitative and quantitative methods to investigate community and family reactions to environmental disaster as represented by study by the pollution of the Pigeon River. My field work research provides the focus of the study. Because of the nature of the problem and the multiple factors and issues involved in the community problem, rigorous methods were employed to provide clear explanations. This includes a total of approximately 500 hours of field work conducted in the period from April 1992 to March 1993. Field work activities included in-depth interviews, attendance at group meetings, review of existing records, and observation in court of the proceeding of a class action suit. These extensive efforts provided a wealth of data. During this period, the researcher travelled from two to three times a week from Knoxville to Cocke County in the eastern part of the state. The average stay was between six and eight hours.

The present study investigates different aspects of environmental hazards using a combination of qualitative and quantitative methods (Figure 5). Initially, the qualitative methods were critical in gaining an entry to the contaminated community. Quantitative strategies provided additional information that validated the qualitative data and provided relevant data for each particular issue. My study was initially concerned almost exclusively with learning the dynamics of environmental disaster in a small community. But as the study progressed, the realistic need for more data required the use of quantitative methods.

Population and Sampling

The eastern counties of Tennessee are-when considered geographically a part of Appalachia. To gain knowledge about such communities, one must learn about the culture of the mountains. Generally, mountain

communities are characterized by geographical isolation. They are economically impoverished and underdeveloped areas that have been neglected economically and socially for a long time. Cocke County is one of these eastern counties. Its population is concentrated along the northern border of the Great Smokey Mountains National Park. The Pigeon River, about 80 miles long, starts in the mountains of North Carolina and runs for 30 miles in Haywood County, North Carolina before it crosses the North Carolina/Tennessee borders. Cocke County is the only eastern Tennessee county that the river crosses for about 30 miles before it ends its journey in Douglas Lake.

The river in Tennessee is posted as a polluted river. The pollution of the Pigeon River started in 1908 when a paper mill opened in Haywood County, North Carolina, dependent on the river water of Pigeon River for the bleaching process. Residents at that time observed a change in the river's color. This change in color was not the only change in the river; the use of chemicals in the paper production process added foam and a strong unpleasant smell. In this study, families of Cocke County, about 8,500, represent the entire population in the study.

The sample in the study consists of two groups: non-activist families and activist families. Non-activist families live on the river banks or close to the river and did not officially join a SMO. To select a sample from this group, a convenience sampling procedure was utilized through door-to-door interviews with residents (N=28). Activist families are families in which one or more family members belongs to a local environmental group in the community (N=22). Members in non-local environmental groups who live close to Cocke County and who have been concerned with the pollution of the river were also included in the sample. The total number of the sample was 50.

The purpose of the study was explained to the participants and a consent form was read and signed by every participant prior to the interview. Because the study concentrates on differences in family

responses, an effort was made to obtain enough activists to match the number in the non-activist group. Names of activist families were obtained from lists of members of the different groups. The procedure utilized in selecting participants can be identified as convenience sampling.

Study Methods

Fetterman, et al., (1989) describe the significance of appropriate interaction with the community. The authors highlight some important principles necessary for successful entry. "Walking into a community cold can have a chilling effect on ethnographic research. Community members may not be interested in the individual ethnographer or in the work" (Fetterman, et al., 1989, p.43). Field work studies might face difficulties if the researcher did not follow a careful plan for entrance. Fetterman et al., suggest the importance of finding a credible "facilitator" to help in introducing the researcher to the community.

In this study, the researcher was introduced to an activist in the community by Lachelle Norris-Hall who had conducted a study on the emergence of environmental group in the county. Another community activist provided help in gaining access to files, providing working space, as well as other administrative assistance such as access to a copy machine and a telephone. Methods of the qualitative research included and in-depth interviews.

At the beginning of my work in the community, a number of families refused to share with me any information about the controversy. Because residents at that time were preparing for the class action suit against Champion, their suspicion was especially aroused by questions from a foreigner asking about their personal feelings about the river. To encourage families to accept me as a researcher, I asked a reporter at the local newspaper, The Plain Talk, to write a short article about my research interests. The story about an international student from the

University of Tennessee interested in the Pigeon River problem was published with a picture of me. In the next visit to the community, I introduced myself to families by sharing with them the published article. When families saw the story about my research they became more comfortable and more willing to discuss with me their feelings, perceptions, and attitudes towards the river. Gaining the acceptance of community residents is an essential part of fieldwork research.

Documents

People's experience with 80 years of this polluted river have made them observers of an historical cycle of events. Generation after generation of the residents of Cocke County collected newspaper articles, books, lists of events, recollections, and stories of the river both before and after the opening of the paper mill in North Carolina. One resident showed me a file that he has maintained on publications about the Pigeon River: "You know, I'm just doing that to show my grandsons that I was concerned about the river. I know collecting articles is not enough, but I feel that I'm doing something... better than nothing." Older residents were eager to tell stories about their childhood and their memories of the beautiful river before the pollution were vivid.

Stories of the early days when the river suddenly changed color and then became malodorous are still etched in peoples' minds. Community residents' stories represent part of the reality that covers the historical dimensions of the problem. Most stories are consistent, with a high level of content validity. Residents repeat incidents with strikingly similar details. The DPRC, founded in December 1986, represents the beginning of community-organized actions to create public awareness and demand a clean river. This SMO established the base for long and sometimes dramatic confrontations, not only with Champion International, but with federal/state organizations that have been involved with the pollution of the Pigeon River.

One of the founders of this organization, Mr. Sullivan, was the director of the Chamber of Commerce in Cocke County, and his office became the center for the DPRC. All documents concerning the battle for cleaning up the river were kept in a file cabinet in the Chamber of Commerce; these files include scientific studies about the water quality of the river, press releases, legal documents, the discharge permit document and copies of petitions sent to different state/ federal agencies regarding the pollution of the river. These voluminous files became one of the main sources of data for this study. Stokely Public Library is located in Newport, the county seat of Cocke County. The only reference to the Pigeon River in the Stokely library is a file containing newspaper articles.

Interviews

Environmental disasters most often cause multiple impacts that disturb the equilibrium of the family and the community. The researcher is interested in different types of information such as scientific information regarding the cause of the disaster, its nature, and its magnitude. Other critical information involves the impact of the event on the people's lives in the community. Historical context is relevant to the research, and present assessments represent this reality with a consideration for people's expectations of the future. To investigate the problem from this perspective, the research should consider numerous factors pertaining to the problem at hand. Consequently, I conducted in-depth interviews with representatives of several social groups. I interviewed community activists; community officials; scientists/professionals; residents; and activist families.

Interviews with community activists was my initial introduction to the community. In this study, activists are members of families who join a social movement and allocate time for activities related to the problem of the river. The main concern in these interviews was to gain an

overall picture of the problem. Issues in these interviews included descriptive information about the community; an historical assessment of the community and the problem; actions related to the pollution of the river; and information regarding different agencies/ organizations involved in the conflict.

Interviews with community officials were intended to gain knowledge about the problem from appointed and elected representatives of the community. The goal was to gain the official's perspective on the problem and his/her perception of community members' opinions. The list of officials interviewed includes: the county executive; the city mayor; the heads of several departments (Human service, Health, and economic development); city council members; the county chief of police; and community businessmen.

Since the problem involves technical and scientific knowledge about water quality, level of dioxin contamination, and the ecological impact of the pollution, another set of interviews was undertaken to poll scientific opinion about the pollution of the river. University professors and professionals in different agencies provided their opinions on the pollution of the river. For example, some expressed disgruntlement with the economic damages that the contamination of the river has caused to the community. Such expressions encouraged the researcher to consult with economists to obtain a basic assessment of the economic impact of the pollution of the river. University professors were interviewed in different disciplines including Sociology, Family Studies, Political Science, and Wildlife.

Families that live on the river banks along Cocke County are identified in this study as the target subjects. These families live closer to the river and have a first-hand experience of its pollution. The experience they provide involves their observations of variation in the color of the river and their confirmations of the foam and the strong odor that cause much of the discomfort level for residents. In this

study, environmental assessment considers not only physical discomfort but also the emotional and psychological effects of living under these conditions. Actually, families that live closer to the river are not the only ones affected: people who live elsewhere in the community have a sense of attachment to the community and to the river as a symbol of it. The river represents different sets of realities to these families. The historical realities include what the river meant to the people in the past, in the present, and the future.

Non-structured interviews are particularly appropriate when subjects are so intense, holding deep emotions about the river. For example, a family that lost relatives from cancer and has strong beliefs that the pollution caused the death might benefit from this type of interview to reveal their deep feelings. Resentment, anger, stress, and loss of trust represent some of these feelings when a family blames the loss of a relative on the pollution of the river. For these reasons, non-structured interviews were conducted to capture families' feelings, thoughts, and general attitudes toward the pollution of the river.

Besides their reflections on the pollution problem, other issues were discussed with activist families to obtain insight about their motivation for activism. Activist families may vary in their reasons for involvement in fighting the pollution within the community. Research must reveal these reasons and identify the different strategies and techniques used in the struggle against an environmental threat. In-depth interviews with activist families provided empirical knowledge of the impact of activism on their family life. A researcher may be interested to know how a family resolves its own conflict and the dynamics that the family goes through in the process of activism. To capture this dynamic, semi-structured interviews were utilized. I developed an interview guide asking questions such as: What is the impact of your activism on your family?

Categorization of interviews indicates variation in the study

questions. While some questions targeted the effects of the pollution on families and the community, others addressed differences among families in their responses to environmental stress. Categorization also reflects the initial stage of the research project. During this period, families and community members discussed with the researcher different aspects of the problem. These aspects involve people's fear, and concern about the polluted river as a health threat. When dioxin was found in the river, families drew the logical connection between dioxin and the increase in the number of community members who had died of cancer. Other issues presented by families related to the impact of river pollution on the economy of the community. For these reasons, the researcher found it necessary to discuss these specific issues with scientists, professionals, and officials to confirm peoples' concerns.

This technique may be necessary as a component of content validity for the issues and concerns presented by the families. In discussing these issues with professionals and scientists, the research intention is to pursue explanation of this phenomenon. Were these concerns legitimate and do they have a scientific proof, or are they distorted interpretation of realities? This method of data collection aimed to verify the issues. Without having a professional opinion, the researcher might lose track of the issues and present a biased explanation. For example, if the community members-including activists and non-activists, officials, and professionals strongly believe that the Pigeon River is polluted, while Champion insists that the problem is only in the color of the river, and no evidence confirms the pollution, the researcher must consult with scientists to gain a clearer view of problem. In this study scientists are identified as biologists, water quality experts, wild life researchers, and environmental officials like the EPA.

Interviewing was used to probe issues related to the study, regarding medical and health concerns, economic effects, the political process involved in the story, and the role of the media in presenting the story.

Without utilizing a validity check on these issues, the study could have been susceptible to bias.

Quantitative Methods

The need for quantitative methods in this study stems in part from the enormous data base generated by the qualitative methods. Initially, the researcher intended to examine the multiplicity of factors that influence community responses; but, as the research progressed, there were consistencies among responses that suggested significance. For example, the qualitative methods identified stress as a major component that affected families' feelings toward exposure to contaminated water resources. Common stress induced by environ-mental disasters was found in the literature to be an important feature of people's distress. It became necessary to obtain more rigorous measurements of stress.

Another reason for the importance of quantitative methods in the study is the need to assess reasons for variations among families in responses to the community problem. The literature review indicated that environmental awareness is an important variable affecting individual response to environmental disasters. To specify and operationalize the significant qualitative variables, I developed a study model to measure the impacts of the variables on the dependent variable, as well as the correlations among these independent variables. The intention was not merely to verify the findings of the qualitative methods, but to provide a substantive examination of the study model.

A questionnaire (Appendix A) was developed during the last three months of the field work that encompassed several scales to assess the study variables. Some scales were adapted from previous studies that investigated the impact of environmental disaster on the individual, the family, and the community. I developed other scales to measure particular variables in the study such as the demographic variables. The questionnaire was pre-tested on a number of community residents (activist=3, and non-activist families=2). After the pre-testing,

revisions were made to improve the quality of the questionnaire.

Measurements

In order to measure the study variables, a number of scales were adopted from actual studies that examined the impact of environmental disasters on communities. Families' perception of community was an important variable that necessitate the combination of scales utilized in previous studies. To measure family functioning and social support, I adopted scales from the field of family studies. One focal variable in the study is stress, therefore, I adopted a scale that has been previously used to evaluate stress generated by environmental disasters. Because demographic variables are relevant to family response, A number of questions were included to gain some information about families' background. A brief discussion of scales utilized in the study will be presented in the next section.

Family Response: The Dependent Variable

The dependent variable was measured to reflect the intensity and level of involvement in positive response to the community problem. Every response was included in the list of responses to reflect time, effort, level of expression, and confrontation with issues related to the pollution of the river. A review of disaster studies was used as a guide for such arrangements of family and community responses. Items ranged from "talked with my family about the problem" to "joining an environmental group" to promote community awareness toward the pollution of the river. Respondents were asked to check all the behavioral responses or activities in which they had participated in the last five years about the pollution of the Pigeon River.

Responses were quantified by giving a score of ten for any one of the ten responses. A high score of 100 indicates that the family had been quite active and has participated in community meetings, expressed

opinions, and joined a community group for the sake of fighting the pollution. A score of zero represents a negative response by the family, including no expression of feelings about the river among the family members.

Environmental Concern Scale

The environmental concern scale is composed of 16 statements focusing on conservation and pollution issues (Weigel and Weigel, 1978). Respondents rate each item along a 5-point Likert-type scale from "Strongly agree" to "Strongly disagree." Higher scores on the scale indicate greater concern about these environmental issues. Evidence of internal consistency was provided via administration of the scale by Weigel and Weigel on selected random samples of a medium-sized New England town in 1976. Weigel and Weigel (1978) found that the Alpha coefficient of the Environmental Concern Scale was .85 and the homogeneity ratio was .26. These results, as the authors stated, indicate satisfactory levels of internal consistency. I adapted ten items from their scale because some items concern conservation issues which are not of concern in this study. But the Weigels suggest that the Environmental Concern Scale provides a promising research instrument that can complement direct behavioral observations by assessing attitudinal dispositions.

Social Support

A social support scale was included in the questionnaire to assess families' perceptions of the importance of social support in the process of countering the pollution. Sources of community support were assessed by asking participants to indicate their views of the importance of each source of social support. A five-point Likert scale ranging from "strongly agree" to "strongly disagree" was included to estimate the significance of every source. The sources of support include family,

neighbors, friends, community, and local government. Another pressing question addresses the particular support that respondents believe to be primarily helpful in the fight against the continual pollution of the river. These types of social support are funding, information, the overall political process, personal emotional support, public encouragement, and publicity in the media. Respondents were asked to indicate the importance of each type of support on a five-point scale ranging from "very important" to "not very important."

Perception of the degree of social support available was measured with a number of questions that addressed the relationship between social support and community activism. Each family's perception of support was also assessed by examining the family's willingness to support one participant of its members in community activism. Activist families were asked to reflect on their experience by providing their assessment of the support received from different sources. For example, activist families responded to a question that evaluated the adequacy of all received support. The adequacy of received support is critical and activist families were given the chance to reflect on this subject on a five-point Likert-type question ranging from "very adequate" to "very inadequate." A total score of 20 (4 items x 5 points) would therefore reflect a high perception of social support, while a score of 4 (4 items x 1 point) indicates a low perception of social support.

Family Relationships

This variable was measured by adapting eight items from the Family Relations Effectiveness Scale (FRES) by D. R. Imig (1981). The scale measures perceptions of family effectiveness, managerial efficacy, family support, sense of personal worth, mutual understanding, and familial cohesion. The self-report scale mainly assesses individuals' perceptions of family functioning as reflected by the dimensions of control, regard, and involvement. The control dimension was not selected in the adapted

eight items since the concern is about levels of family support, regard and involvement. A question with a 5-point Likert-type response ranged from "strongly agree" to "strongly disagree." Reports on Cronbach's alpha for the scale range from .81 to .90 for a sample of husbands and wives, with test/re-test correlations over a two year period of .54 for husbands and .70 for wives (Touliator, et al., 1990).

The Structural Variables

Resource mobilization approaches emphasize the importance of structural variables as facilitative conditions for the emergence of social movement organizations. A number of assessments were included in the questionnaire to measure these variables.

Sense of Community:

The first scale measures families' perceptions of community (Barchrach and Zautra, 1985) to assess agreement with community values and beliefs. Family interest in being a part of the community was also addressed by this scale on 5 point Likert-type questions. A high score on this scale indicates family agreement with the community's values and an interest in remaining a part of the community. A low score suggests their sense of dissatisfaction with the community norm and the tendency of a family to want to be recognized as a separate entity.

Attitude Toward Community Scale:

Another scale was used to assess family attitudes (Picou, 1984) toward the community generally. The scale reflects individual's and families' assessments of the quality of life in the community. Also, the scale measures their sense of cooperation and unity within the community. The seven items on the scale describe levels of agreement of families with a statement provided. A high score of 35 represents a positive attitude towards the community while a low score of 7 indicates a

negative attitude towards the community.

Social Involvement:

The literature indicates that people who have developed adequate personal and social skills are more responsive to issues and problems that affect their communities. Exposure to broadening experiences helps individuals and families to be more open in expressing their feelings and to think objectively about the need for solutions. Participation in community activities provides individuals and families with social and organizational skills that facilitate finding practical solutions. Examples of organizational skills include raising funds, arranging meetings, and preparing agendas. To assess their level of social involvement, participants were asked to respond to a question about their associations with a number of community and activity groups. A score of five was assigned for every group, and the respondent's membership with groups is then multiplied by 5. A high score of 50 represents a high level of social involvement, while a score of zero reflects no participation in group activities in the community. The list of groups included social, environmental, political, service, religious and sports organizations as well as membership in charitable organizations and labor unions.

Political Participation:

The presidential election was held in November of 1992 during the course of this research. To capture in quantitative terms the political interest of families and how they relate to their involvement in community activism, a number of questions in the survey addressed the following: participation in the election; the presidential candidate that the respondent voted for; and their usual political affiliation.

Risk Perception

Risk perception affects family responses in two ways. The direct effect of risk perception can be seen in the positive correlation between the two variables. However, risk perception influences family response mainly through its impact on environmental awareness. Families that perceive environmental problems as risky and dangerous might be more aware of changes in the physical environment. Thus, this type of family tends to confront these problems in a way consistent with their understanding of the potential risk involved.

Risk perception was measured with questions that reflected a family's feelings, opinions, and thoughts about the seriousness of the river's pollution. Six items used a the Likert-type scale to measure risk perception on a 5-point range of responses that represent agreement or disagreement. Several scales were reversed to address family risk perceptions in an objective way. An example of the questions follow: "If the EPA or the Health department announces that there is no risk from dioxin, I will be willing to eat fish from the Pigeon River." A total score of 30 (6 items X 5 points) represents high risk perception while a score of 6 (6 items X 1 point) reflects low risk perception.

Family Structure and Demographic Variables

Several types of families were included in the questionnaire to distinguish among families with children at home, families with no children at home; older couple families; and single parent/person family. The reason for such classifications is to define the relationship of family structure to level of family response to the pollution problem. Research shows that a family with children at home might be more prone to react to exposure to toxic materials that represents a health threat to the children. Older families tend to resist change for two reasons: to avoid moving out of a community to which they have already adjusted; and to avoid the devaluation of their homes' values.

Demographic variables included the annual family income, occupation, age, level of education, duration of residency within the community, and distance of residence from the river. Distance of residence from the river was measured by yards and miles because of the belief that those living closer to the river are more likely to perceive risk.

Stress

In the initial phase of the study, I found that families in Cocke County experienced high levels of stress. Stress resulting from environmental disasters was found to be a strong indicator of the emotional and psychological consequences. In the case of chronic environmental disaster such as this where a community has suffered for 80 years from a polluted river, a strong indicator of a different type of stress was found, chronic stress. People have inherited distress and sad feelings about the river over generations. Other significant emotional impacts were observed, such as loss of trust, fear of health consequences, and uncertainty about well-being. Families expressed feelings of helplessness, hopelessness, and desperation. Thus, stress in this study became a focal variable that reflects families' emotional states and to some degree families' responses. Because this variable represents the cornerstone of the study, I decided to measure stress using multiple methods: observations of stress and self-reports of stress.

A number of techniques were utilized to observe, directly and indirectly, the level of family stress. These techniques included observation of active community groups, a review of records, and focus group sessions with families. In-depth interviews were considered as a self-report method, while focus groups used interviews as an observational method. The strategy for the focus group session was to allow family members to express and react to others' expressions of emotions about the polluted river. This technique allowed the construct

of interest to emerge, i.e. stress.

Focus group sessions were conducted in which the researcher's role was only to provide selected topics and facilitate the family discussion. The researcher kept a minimum level of intervention in the family discussion in order to observe the non-verbal communication, level of emotions, and the general atmosphere of the discussion. After every session, the researcher recorded his observations with the intention of utilizing these notes during the coding process.

A coding system (Figure 6) was developed to rate the family's level of stress. The topics included the following: feelings toward the river as a "symbol" (FS); seriousness of the pollution and its impact (SP); fear of health consequences (FH); opinions regarding specific issues concerning the river (OI) such as the treatment of the paper company; and concern about the future of the river and the community (CF). Each topic was assessed on specific parameters that included: agreement among family members; tone of voice; anger; and frustration. For every topic discussed during the interview, the responses were evaluated on every parameter on a scale from 1 to 5 points. An overall score was obtained for each family that reflected level of stress, and a score of every topic was also obtained. These observational and coding techniques were suggested by the Copeland and White (1991) discussion.

The review of the literature indicates that a particular set of behaviors is associated with exposure to environmental pollution. Families who live in a contaminated community express concern about their well-being, become anxious to find solutions, and feel frustration at the uncertainty of future consequences.

The scale for self report of stress included eight items to assess the level of stress expressed by families. Respondents were asked to express their agreement or disagreement with eight statements reflecting the domain of the concept of stress. Studies of environmental stress typically show that victims of any sort of disaster express feelings of

concern, fear, desperation, disbelief, anger, loss of trust, uncertainty, and resentment. A score of 56 (8 items x 7 points) indicates a high level of stress while a low score of stress was reflected by a score of 8 (8 items x 1 point).

Data Analysis

Two main methods of data analysis will be included in the study report.

Qualitative Analysis

This section will present the results of observation methods. Data will be sorted according to different topics. For example, the economic effects of the pollution will be discussed. Statistics of family income, unemployment rate and recipient of social assistance such as AFDC will be used to measure the economic factors related to the problem. Studies that evaluate quality of health services in the county will be included as an indicator of community conditions. The study of water quality of the river will involve data collected from scientific studies. Community perception of the problem will also be assessed by presenting the different views of community residents. Field notes are essential in the explanation of factors that determine family responses to the pollution. Group activism becomes an important determinant of community and family response.

Quantitative Analysis

The family is the unit of analysis in this study. In the process of data collection, families were asked to discuss every question to reflect a family opinion. Since the aim of the study is to present family's views and perceptions as a unit, and less interest was given to variations among family members on attitudes or opinions, the study tended to concern itself with the common perception of the family.

Another reason for considering family response as a unit of analysis stems from the early stage of the field work, when I observed a high level of agreement among family members on issues. The theoretical interpretation of such a high level of agreement might be found in the nature of the study that reflects perceptions of families toward a common environmental threat.

Another reason for interfamily agreement might relate to the historical dimension of the study, the long period of the pollution of the river for almost 90 years. I observed that stress is inherited and that families tend to adopt the same views of the previous generation. For example, when families were asked to explain the reason for the lack of community actions for the last 80 years, the simple explanation was because of the power of money in the region where Champion is viewed as the influential opponent. Family members who have less exposure to the outside world and no knowledge of other communities' experiences tend to develop common perceptions.

Families responded to the questionnaire in a collective manner. Data collected for the family is considered as a single score for every variable included except the demographic variables such as age and education. A number of statistical analyses will be utilized in this study including:

1) descriptive analysis of the study sample for the demographic variables; 2) correlation analysis which will consider the degree of association among the independent variables; 3) differences in the study models will be examined between the two groups of activist and non-activist families and will be discussed.

In order to develop a better understanding of family response to environmental disasters, it is important to capture the complexity of the problem. The adoption of a rigorous methodology was valuable in investigating the various factors involved in the problem. Fieldwork was a critical tool used to gain insight on the impact of the contamination

of water resources on families' lives. For further information, a study questionnaire was developed and implemented to provide in-depth knowledge on family response.

A study of the historical facts regarding the community of Cocke County is relevant to this research because impacts of the problem have been distributed across multiple systems in the community. The pollution of the Pigeon River is a unique type of disaster. The 85 year of pollution has impacted every aspect in the community such as economic, social, health and cultural systems.

CHAPTER VI

THE HISTORY OF COCKE COUNTY AND THE PIGEON RIVER

Cocke County is located on the eastern side of the State of Tennessee. Historically, the county has been geographically and socially isolated. A historical review provides an in-depth understanding of cultural factors that influenced people's lives in the small community. Cocke County is a poor mountain community in the Appalachian area. The pollution of the Pigeon River has been a part of the reality of the community, depriving it of real opportunities of economic development. However, in the last ten years, Cocke County residents have participated in a new trend, uniting the small community in fighting the pollution of the Pigeon River.

In 1797, the Smoky Mountain region of Cocke County was known as the "Wilderness Country," and as the "Over Mountain Country of the Cherokees." The Cherokees were the first to inhabit the Smokies. As Dykeman and Stokely write "By the 1600s these Indians had built in the southern Appalachians a nation hundreds of years old, a way of life in harmony with the surrounding natural world, and a culture richly varied and satisfying" (Highland Homeland 1978: p. 2). The first European to arrive in the area was Samuel Davidson, who settled with his family in 1784. But Samuel's death at the hands of the Indians did not discourage his brother William Davidson and other family members from settling in the new land. The fertility of the Big Pigeon and French Broad River areas was too attractive to be resisted. Immigrants flooded the area from neighboring states such as Virginia, North Carolina, and South Carolina long before the State of Tennessee was organized. Most of the immigrants were Scotch-Irish who came to the American frontier searching for religious freedom and economic opportunities.

On October 9, 1797, Cocke County was created by a legislative act that separated it from Jefferson County. Cocke County was known for its

three rivers, the Nolichucky, the Pigeon, and the French Broad River, and for its fertile valley. The new county was named after General William Cocke, for his strong advocacy of settlement in the new land and his role in the formation of Franklin, later the State of Tennessee in June 1, 1796. An influential politician, Cocke was the delegate from the free state to the United States Congress, and a legislator for Virginia, North Carolina, Tennessee and Mississippi. William Cocke introduced the bill to the House of Representatives that in 1794, created Blount College, now the University of Tennessee (O'Dell, 1950).

Newport, on the French Broad River, was named as the Cocke County seat. But as the county grew, residents found it inconvenient to cross the three rivers to perform their duties in political and business matters. Consequently, in 1884 the county seat was moved to the city of Clifton which was then renamed Newport. In 1873, the following was written about the towns in Cocke County: "There are four towns in the county: Newport, Parrottsville, Sweetwater and Clifton. The first has a population of 800, the second one of 300, the third 150, and Clifton had about 200" (O'Dell, 1950). During the early formation of Cocke County, settlers were entitled to a certain number of acres to secure their residency.

Cocke County grew rapidly in population. In 1851, the population reached 5,781; and the number had grown by 1890 to 14,308. The total population of Cocke County was 20,722 in 1920 and 24,083 in 1940 (O'Dell, 1950 p. 184-5). Cocke County lies on the western side of the Smoky mountains. These mountains mark the boundary between Tennessee and North Carolina. The county has a triangular shape and consists of 458 square miles bordered by Hamblen County in the north, Greene County in the northeast, Jefferson County to the west, and Sevier County in the southwest. Cocke County has unique geographic characteristics that include high mountains, beautiful valleys, numerous cliffs, three major rivers, and several creeks. The Big Pigeon River was named Waijeh by the

Cherokee Indians, meaning "beautiful maiden." The river flows from high in the mountains of the Pisgah National Forest through Haywood County, North Carolina, crosses the Tennessee border at Cocke County and finally empties into the French Broad River near Knoxville. The Indians were fascinated by the beauty of the river and the name Big Pigeon appealed to their imagination because it signifies rapidity: its flow rate was so rapid, about a mile per minute, that the Indians said it "flew like a Big Pigeon" (O'Dell 1950: 31).

Besides its speed, the Big Pigeon River beauty is apparent in a number of beautiful cliffs, some over one hundred feet. Historians Dykeman and Stokely quote a Civil War veteran's remarks about the Cherokees' ties to the river, that the Cherokees "possess a keen and delicate appreciation of the beautiful in nature. Most of their elaborate mythology bore a direct relation to rock and plant, animal and tree, river and sky" (1978, p. 32). The first sign of the pollution of the river occurred in 1908 after production began at a paper mill in Canton, North Carolina. Manufacturing processes turned the river water to a blackish foam. Because the river represents the focal point of this study a detailed discussion of the quality of water in the river will be included in the following sections.

Economic Development of Cocke County

Since the establishment of the first European settlement on the fork of the French Broad River and the mouth of the Big Pigeon, residents grew their own food or found sustenance in the forest. Cocke County consisted of rich and fertile land. The first product cultivated in the new farms was corn. The availability of land and the abundance of water resources made farming the dominant economic activity. The need to market the surplus crops created the first store in the old Newport. New job opportunities opened that involved trade and the transportation of the products to Knoxville, Tennessee, the closest big city, and to Asheville,

North Carolina. Cocke County residents imported necessary products that they did not themselves produce. Dykeman (1955) states that the people had to master many skills to survive in the new isolated communities. For example, John Smathers was called "a good rock and brick mason, carpenter, shoemaker, tinnier, painter, blacksmith, and plumber" (Dykeman, 1955: 61).

In the early years, then, the Cocke County community depended on agriculture for its economic base. The family farm represented the basic economic unit. Residents planted corn, vegetables, fruits, and grains. Besides farming, people in this Appalachian community also raised hogs. This region was known as the major source of troop supplies during the Civil War. This experience brought a type of exploitation when troops ruined the area searching for food and sometimes stealing families' stored goods.

Farming activities in the county supported the establishment of a canning industry to utilize the abundance of crops. In 1898, the first canning factory was built by the Stokely brothers. The new industry was an economic boon because of the expansion in farming and the job opportunities created for local residents. Statistics reveal that, around 1930, about 15,000 of Cocke County's population of 21,775 were involved in agricultural activities (O'Dell, 1950 p. 185). At the beginning, work in the canning company was seasonal and associated with one product, tomatoes. But production soon changed to a year-round project. A variety of crops were processed at the cannery, including string beans, blackberries, huckleberries, apples, peaches, and sweet potatoes.

The Stokely Brothers' industry became one of the main economic enterprises in the region because of their skills in marketing, transportation, and the utilization of new technologies. As a result, Cocke County in 1934 ranked seventh in vegetable production among Tennessee counties. In the 1940s, most of the county's residents

(24,083) were associated with agricultural activities, and Newport gained the reputation as one of the largest canning industries in the world (O'Dell, 1950 p. 185).

If agricultural activities had been exploitative, the lumber industry was perhaps more so. The abundant resources of the Appalachian region had always been a target for new investors who came to the region searching for economic advantages. As shown in the regional impact from a massive cutting of trees in the forest, the timber industry had become dependent on an area that had a limited future. Cocke County, as one of the Appalachian counties, has endured its share of the cruel timber activities. The region's total dependency on outsider-owned companies excluded local residents from any share in investments. These companies provided temporary work with low wages, contributing little actual economic development to the local economy. The same was true of the mining industry when outside investors searched for raw materials. When a mine was found, it provided only a temporary work opportunity for local residents, characterized by low wages, no share in the company assets, and no health or pension coverage. In the final analysis, mining devastated the ecological system of the region.

This has been the case with nearly every industry that has come to the area. A set of regulations was established by every industry to insure total obedience from workers to protect the status quo. Cable (1991) explains such restricted systems as in the case of Yellow Creek where the coal industry had divided residents into small communities and encouraged competition among the camps through baseball tournaments and other athletic events in order to inhibit the solidarity required for union organizing. In the 1880s, a Scottish investor visited Cocke County to assess the opportunity for establishing a timber industry. Alexander Alan Arthur started his project by buying 126,000 acres of land on the western side of North Carolina. This step was followed by the establishment of a mill in Newport. Initially, the project gained

momentum and new investors followed his steps. Norris-Hall (1988) argues that the lumber industry was associated with new social class divisions in which investors created their own class, participating in local politics only to insure the continuation of their own empire. "Just as Arthur's wife refused to be associated with the local people, whom she saw as uncultured and strange, so there developed class distinctions in contrast to distinctions based on status, personality characteristics, or traits (e.g. age, sex) of the original residents" (Norris-Hall, 1988 p. 62). The timber industries renovated the city of Clifton as new houses were built, streets were established, and other supportive facilities emerged. Other measures of division in social class are apparent in the creation of clubhouses and tournaments for the upper classes, which have served to present a new culture (Norris-Hall, 1988). These new cultural patterns represented a paradox for the residents of the previously isolated community of Newport.

An influx of foreign residents occurred, who spoke in different accents (Scottish) and wore different styles of clothing. Local citizens found job opportunities in selling their goods to the other workers and new citizens in the community. The unexpected economic boost from the timber industry was ended in a dramatic way. Logs and trees cut from forests were thrown into the Pigeon River to be driven by the current up to the Newport mill. In the spring of 1886, continuous rain increased the water level of the river until dams broke and many logs were lost (Dykeman, 1974). This big loss marked an end to an era of prosperity for the region, and also made residents conscious that outsiders controlled their community without sharing vital economic and social benefits.

At the beginning of the twentieth century, the town of Dryce witnessed another experience with the timber industry. The Tennessee and North Carolina railroad was constructed in the area. John Hart, a West Virginia contractor, was influential in building the track through Dryce. As a gesture of appreciation, community residents combined the name of

the contractor with the name of dominant elites in the area, Ford and renamed the town Hartford (O'Dell: 51). About 18 lumber companies operated out of Hartford. The business of logging in small communities is characterized by: 1) rapid growth accompanied by changes in the local economy represented by job opportunities; 2) a period of prosperity marked with the establishment of housing in the small communities; 3) a growth in population considering the number of migrant workers who move to the region; 4) an increase in services such as restaurants, stores, and entertainment businesses; and 5) an anticipated end of the industry after exhausting the environment. The impact of such a cycle is reflected in the demographic characteristics of the community, which can be seen in the decline of the community in population, business, and the economy. For example, during the Hartford timber industry era, around the late 1920s, the town had expanded to include large numbers of homes, businesses, a movie-theater, and public transportation services. Overall, the timber industry caused damages to the communities represented in the massive cut of trees in the area. A significant legacy of the timber industry was the transformation of land ownership from Cocke County natives to entrepreneurs outside of the region.

The vigorous attack by the lumber industry on the forests of Cocke County ended with the establishment of the Great Smoky Mountains National Park in the 1930s. This park covers about 17,170 acres of Cocke County. Residents of Cocke County were initially reluctant to give up their land for the National Park. Dykeman indicates that "residents were frustrated and unwilling to give their land for this purpose. However, they gradually acknowledged the fact that a park and its tourist trade might be a continuing asset" (1978: 142). Cocke County had the potential to become a popular resort area with its three rivers, high green mountains, and numerous creeks. But the construction of an interstate highway in October 1964 blocked the chance for tourism, as it passed by Newport. The county had suffered economic hardships in the past due to the absence

of a sustained infrastructure. Dependence on the logging industry created extremes in social class and power that still characterize the region. During the 1930s and 1940s the canning industry represented another shift in the economy of Cocke County, characterized by the increase in the agricultural base, whereby some new jobs were created. But the ensuing recession caused the loss of industrial enterprise and an increase in the unemployment rate within the community. People in the community sought job opportunities in other communities, especially in the tourist attraction areas of Gatlinburg and Pigeon Forge in Sevier County. However, these jobs are seasonal and offer no opportunity for fringe benefits or insurance coverage.

In sum, the economic history of Cocke County is one of instability. As a part of Appalachia, Cocke County was an appealing target to outside investors hoping to take advantages of the rich natural resources. Some sociologists consider this a classic example of the exploitation of underdeveloped communities (Gaventa, 1980). Industries that extracted resources from the area located their headquarters and their profits in other states. So when these industries moved out, they left no major economic improvements, but they did leave in their wake a degraded environment.

The History of the Pollution of the Pigeon River

A number of branches of small streams originating in the mountains on the west side of North Carolina converge to form the Pigeon River. The river at its origin is sparkling-pure, ice cold, and crystal-clear. Early European settlers named it the Pigeon River because of a plentiful bird that inhabited the region. The river moves swiftly from the Pisgah Mountains through the valley for about 80 miles to end its journey in Douglas Lake, Tennessee. In this geographical setting, the Pigeon River has been characterized as a pure white water. The river runs for about 60 miles in North Carolina (Figure 7) before crossing into Tennessee.

Historically, the river provided a source of water for the inhabitants of the valley, and people in both states depended on it for irrigation of crops, fishing, and entertainment. One resident of Cocke County described the Pigeon River as "three rivers in one, ranging from advanced white water rapids, to a more moderate white water class, to finally a gentler fishing river as it empties into Douglas Lake" (Norris-Hall, 1988: p. 89).

In 1908, a paper mill called Fiber Paper Company began operations in Canton, North Carolina. Although the mill has provided a stable economic base for Haywood County, North Carolina, the waste from production processes pollutes the Pigeon River. Technically, the paper industry uses water to reduce the color of the trees in the process of production. The water is warmed and consequently loses of some of its biological components such as fresh oxygen. The water discharged from the paper mill into the river is colored, hot, has a low-level of oxygen, and is combined with chemicals. When the mill began production, downstream residents immediately observed a drastic change in the water. It was brown, foamy, and smelled like rotten eggs. This abrupt change in water quality made a strong impression on the residents of Cocke County. Not only was the water unsafe for drinking, but there was also a drastic decrease in fish.

The Impact of Pollution on Water Quality

Since 1908, conditions in the Pigeon River have been studied by numerous state and federal agencies, including the states of North Carolina and Tennessee, the Tennessee Valley Authority (TVA), and the United States Environmental Protection Agency (EPA). Most studies find a wide variety of deleterious pollutants afflicting the waterway. The Pigeon's brown, coffee-colored waters were highly degraded by every measure, including chemical, biological, and aesthetic. A visual observation of the Pigeon River above the mill's discharge point in

Canton shows the water to be crystal clear, with rocks visible at the depth of several feet. In contrast, the water below the mill is murky and coffee-colored with foam along the entire length to Douglas Lake,a distance of 64.5 miles. Studies found that the river above Canton is usually less than 10 color units (C.U.), which is typical for mountain streams in the area. Below the mill, the monthly average color unit is around 770, with some monthly averages as high as 1400 C.U. (TVA, 1983).

Although color levels are reduced by dilution from tributaries entering the Pigeon, such as Richland Creek and Jonathan Creek, color levels continually exceed 100 C.U. and sometimes exceed 200 C.U. "The color comes from the pulping and bleaching processes at the Champion mill and is comprised of lignin materials that are resistant to biological degradation in the mill's secondary treatment plant" (Fremont, 1980 pp. 1-2). Highly colored tannin and other compounds derived from wood are present in excessive levels, greatly reducing light penetration, decimating aquatic plant life, and creating an environment that is intolerable for fish. Fish cannot survive in high levels of organic waste matter because such matter deprives the river of the dissolved oxygen needed for healthy fish populations. At the same time, toxic compounds derived from wood during the paper-making process have caused chronic toxicity to fish and other organisms. The water's high temperature at the discharge point makes the river unlivable for cold-water fish such as trout that were once present (NC Dept of Natural Resources, 1978).

Suspended solids have a major impact on water quality in the Pigeon River. A study conducted in 1978 by the N.C. Division on Environmental Management indicates that suspended and settleable solids are likely to be damaging to the aquatic system by destroying bottom habitat for benthic organisms through gill damage and the reduction of light penetration. More evidence of the degradation in water quality is the 90 percent reduction in the amount of fish downstream from Champion

compared to its upstream level. It has been confirmed by a number of studies that dissolved and suspended solids in on the river ruin the habitats and spawning sites of fish and other aquatic life (Schacher, 1992; Denton, 1992).

Due to the presence of organic matter in the elevated temperatures of the Champion effluent, dissolved oxygen has often fallen below minimum standards for waterways such as the Pigeon River. This effect can be observed in July, August, and September when low flows and high temperatures constitute physical limitations in the amount of oxygen that can be artificially added to the water. Another effect on the quality of water drives from the chloroform discharge. Throughout the history of the paper mill, Champion has discharged chloroform: "Chloroform is the pollutant in water with the highest risk" (Travis and Hester, 1990 p. 464).

Yet, another problem with the water quality in the Pigeon River is the presence of dioxin. Travis, et al., (1990) refer to Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) as the most potent chemical carcinogen ever evaluated by EPA. Evidence indicates that dioxin is probably a carcinogen in humans as well. Fish living and feeding in dioxin-contaminated water can concentrate the compound in their flesh thousands of times the level found in the water. In 1988, a report revealed by the EPA indicates that a critical level of dioxin was found in fish caught in the Pigeon River and in Douglas Lake. Currently, Champion denies any adverse effects of their effluent on the water quality of the Pigeon River. Throughout the mill's history, Champion officials have vigorously responded to accusations of polluting the river by maintaining that it is only a color problem. Although reports of the presence of chemicals and highly toxic materials in the water have been published, the company has generally been successful in minimizing these impacts through reports and media coverage filled with technical jargon. For example, when dioxin was found in the fish tissues, Champion declared that a new effort

was being made to minimize such discharges. That type of defense is typically followed by a strong statement that minimizes the pollutant, and declares that it no longer represents a problem to the public (The Wire, 1990).

Contrary to Champion's denials, empirical studies continue to show the adverse effects of Champion's discharges on water quality. An assessment of water quality by Schacher states, "the Canton Mill is an integrated, bleached Kraft pulp and paper manufacturing facility producing food board and fine paper. Water quality, aquatic plant communities, benthic macroinverteberates and fish population have been analyzed, and all were found to have been severely degraded by the effluent discharged by the Champion Mill" (Schacher 1988, 1989, 1990, 1991, 1992).

With the 1988 discovery of dioxin and furan contamination in Pigeon River game and nongame fish species below the paper mill, the controversy was expanded beyond ecological, economic, and recreational concerns to focus on human health issues for sport fisherman and nearby residents (Schacher, 1992). Schacher reviewed a number of empirical studies of fish assessment in the Pigeon River. One of these studies was conducted by Greeley et al., in 1990 that used an experimental design to conduct a toxicity test on redbreast sunfish and Japanese matico considered to be pollution-sensitive species--using water from above and below the mill and from control waters such as the Middle Prong of the Little Pigeon River near Sevierville. The researchers conclude that natural waters contaminated with high concentrations of bleach Kraft mill effluent have the potential to seriously disturb the proper development of fish embryos (Greeley, et al., 1990).

Although the present study concerns social and sociological assessments of the pollution of the Pigeon River, I have observed the river in field work over 50 times in different seasons. The initial observation of the river indicates dark brown water especially in

summertime when little rain occurs. Strong odors can be detected close to the river, and signs warning the public of the danger of using the water are posted by the Tennessee Department of Health and Environment and Greenpeace.

Community Responses to the Pollution of the River

The review of hundreds of documents, newspaper articles, and personal interviews suggests the importance of dividing community responses into three major categories. At the beginning of the pollution in 1908, people made personal efforts to complain to different agencies and organizations, including the paper company. These efforts were followed by the birth of a social movement organization known as the Dead Pigeon River Council (DPRC) which took the lead in pursuing means to resolve the problem. DPRC members were successful in gaining public attention and increasing public awareness of the problem. The third strategy adopted was litigation.

Early Community Response

Early in this century the pollution of the Pigeon River took the residents of Cocke County by surprise. The Pigeon River was a critical feature in the community that symbolized the beauty and serenity of the area. Elderly residents still remember how they spent time fishing in the river, swimming and sitting around its banks and enjoying its beauty. One of the most attractive characteristics of the river is the rapidity of its flow. The possibility of ecological change was reported in the local newspaper "The Plain Talk," established in Newport in 1900. A February 16, 1906 article explained the probability of opening a new paper mill in Canton, North Carolina because of the purity of the water at the site. The writer expressed some hope of having the mill built instead in Newport, Cocke County where "The entire county would be benefitted." But after long negotiations between Canton property owners

and the company officials, the new mill was established in Canton.

An April 13, 1911 article explained a new wave of investment in the area. At that time, there were two Champion companies surveying the area of Western North Carolina and Eastern Tennessee. Champion Lumber's $5,000,000 company represented the interest of a New Jersey investment company. Champion Fiber Company, the owner of the paper mill located in Canton, North Carolina, was also interested in buying land in the area. At that time, people hoped that is type of investments would pay off: "Furniture manufacturing plants will spring up along with other developments." (The Plain Talk, 1911).

When residents of Cocke County observed changes in the water color, they made every effort possible to complain to different agencies in Tennessee. Evidence of the pollution was detected and the State of Tennessee became aware of the situation. But lack of funds at the time delayed state efforts to reverse the condition of the river. In January 1912, Governor Hooper of Tennessee granted Champion additional time to perfect the chemical process for the purifying of the Pigeon River and French Broad Rivers. A newspaper article at that time reported: "Hooper took the position that the state had no desire to embarrass the Fiber Company but that, if after a practical test the process was found unsatisfactory, then legal means would be taken for the protection of the Commonwealth interests. The pollution has been found to travel 90 miles from Champion's plant into Dandridge, TN." (The Plain Talk, January 1912).

This article documents the beginning of political involvement as part of the process of community response. But Governor Hooper of Tennessee delayed the suit to avoid embarrassment to Champion International. Champion responded to the threat of legal means with a promise to build a $750,000 plant that would take care of the pollution. Champion's tactics for facing public and political pressure were characterized by 1) the public expression of deep concern about the problem; 2) the

promise of new technology in the near future but which was seen by concerned citizens as a tactic for gaining time and avoiding further public pressures; 3) the denial of any sort of wrong-doing and the emphasizing of the industry's value to the region; and 4) attempts to sway public attention through the media in order to forge support. This strategy historically has worked for the company, especially when the company did not hesitate to allocate the resources to carry it out.

An example of the processes adopted by the company appeared in an April 1912 appeal to the public by the company through the local newspaper:

> Champion Fiber Company is making great savings in their wastes to build a $750,000 plant. The Champion Fiber Company is making every effort to stop the pollution of the Pigeon River which is carrying its black waters into the French Broad and the Tennessee River. The matter was recently up before the State legislature... You may be sure that all manufacturers including ourselves will continue to work at this problem until it is solved. As soon as a process for utilizing the waste is found, the company will spare no expense in establishing a plant to take care of it also. The waste from the extract plant and from the wood room have been eliminated.
>
> The wood room waste is utilized for fuel and all escape to sewers from the extract plant has been stopped by the use of samples having a sewer connection which can only be discharged by means of siphon connected to the liquor line through the bleaching cells. Absolutely no extract waste is now escaping. The bleach sludge waste will be stopped by the proposed new chemical plant which is to be installed at Canton at a cost of $750,000. The improvements now being installed are proposed to be erected in the near future and will reduce the total waste to 1/5 or less of what they remaining waste to be cared for, and this only represents a theoretical loss to us, the manufacture, and no harm or hurt whatever to anyone else.

The significance of this article is that it came in 1912 to set the stage for the company's definition of the problem: It is treatable, not harmful, not a risk to anybody. Technological promises have made community residents believe in the company's ability to install advanced technology to eliminate the problem. The article is filled with technological jargon to assure the community of a comprehensive solution. Over the years, that theme has frequently been used by the company. For example, when public pressure was heightened in 1980, the company employed the same tactic, promising a final solution in 1994, at the end

of the modernization program expected to cost over $300 million. Again, many residents were reassured, as were politicians, government officials, and administrators who granted Champion the time it requested.

The first attempt by members of the Tennessee state legislature to address the pollution of the Pigeon River was in February 1920. The legislative body acknowledged that residents of east Tennessee had complained about the condition of the river. But a bill to prevent the pollution died even before it was formally introduced.

The previous article shows the lack of adequate response of the legislation to a problem affecting not only Newport, but also Knoxville and other communities along the river's route. No one really knew how the proposed legislature was developed or why the bill died. Ten years later, many residents were astonished to find that the river was still polluted.

A newspaper article published in September 1923 reported that tons of fish died in the Pigeon River as a result of acid from the Canton's mill. That was the first time that residents saw the actual impact of the pollution. When people in Cocke County complained of the loss, the company threatened to close the mill and ridiculed the value of fish. In doing so, the company represented the problem as fish versus jobs. Lack of legislation and legal actions by the State of Tennessee encouraged the company to continue its practices, disregarding the concern of people who lived downstream.

The same political maneuver of threatening to close the mill and leave the community of Canton in a state of economic chaos was used 60 years later in 1988 during waste water permit processes. Community efforts in Cocke County continued in another phase. Living with a polluted river became unacceptable. Residents took the matter into their own hands due to the lack of an adequate state response. Generally, residents' response to the continuation of pollution in the river was represented by individual response. From time to time a number of

concerned citizens in Cocke County travelled to the mill in Canton N.C. to discuss the problem with the company officials. The company typically expressed concern over the issue and promised the visitors of a new technology that would resolve the problem in the near future. Evidence of pollution was found in numerous scientific studies, but did not generate an outcry. A new shift in the direction of the Pigeon problem occurred in the 1950s when the federal government became involved in the issue; but adequate and solutions were still not reached. For example, when the Pigeon River pollution problem was heard by the U.S. Public Health Service in Washington, the problem was turned over to Tennessee Valley Authority and the Corps of Army Engineers. These two agencies did not provide adequate solutions to the problem.

To summarize, then: without consultation with neighboring states or studies of future consequences, the paper mill opened in Canton, North Carolina in 1908. Paper production requires large amounts of water; hence, the choice of Canton. But as the mill was established and then expanded, the river proved to be too small for the industry. Downstream residents of depending on the river as a source of clean water, suffered the consequences. Evidence of pollution was abundant: the dark-brown color, foam, and rotten-egg smell have created feelings of revulsion. In many situations, concerned citizens from Cocke County travelled to present their case in the Tennessee government or North Carolina. Consultations with the company also took place on many occasions.

But the company believed its economic benefits outweighed color changes or dead fish. The company typically was successful in placating the public through technological promises of new plant processes that would resolve the pollution problems. Political manipulation was another tactic that the company successfully adopted to ease public pressure and to gain more time. From time to time, the company would present a new project promising improvement and revealing the cost of the project to be in the hundreds of thousands, or even millions, of dollars. In 1972,

the Clean Water Act was approved by the U.S. Congress. That bill became the legal basis for the protection of water quality. violations of water quality.

Organized Community Protest is a New Trend

During the 1970s and 1980s a new environmental movement emerged on the U.S. scene. Incidents of technological disasters such as those at Three Mile Island and Love Canal promoted environmental awareness on a national level. People realized that environmental disasters can happen and that their impact is often far beyond their individual capabilities for coping. After Champion's failure to fulfill numerous promises, a new perception of river quality arose that suggested the importance of community involvement.

Mr. Mark, a retired paper engineer who moved to Waynesville, North Carolina, 15 miles from Canton, was a principle activist against the pollution. In 1980 he and a group of concerned citizens from North Carolina formed the Pigeon River Action Group to promote residents' awareness of the problem. Mr. Mark's long experience in the paper industry, especially his knowledge of production processes was helpful in explaining the effects of the pollution.

In 1980, the State of Tennessee filed suit against Champion International Company asking for the enforcement of Tennessee water quality regulations on the paper company. For a paper company to be able to discharge any waste materials into a public waterway, a permit must be granted by a state agency such as the Environmental Management Commission. In 1981, Champion's permit expired and that gave the State of Tennessee the opportunity to intervene in the permit process. The State of Tennessee in 1983 recommended a permit for the company that would reduce the amount of colorants in the discharge water. Champion immediately refused to accept the Tennessee model. The State of Tennessee responded to Champion's rejection by issuing a complaint

against the paper company presented by the Tennessee Attorney General and Department of Public Health. As the legal process continued, Champion was found to be in violation of its own state's water quality standards. This unprecedented ruling marked the beginning of enforcing one state's water quality standards on an out-of-state company. The January 15, 1985 ruling declared that the State of Tennessee could require the North Carolina company to meet the Tennessee's regulations on wastes dumped into the Pigeon River.

To counter this new development, Champion used their traditional tactic of requesting more time to implement a new ultrafiltration system, which they claimed would remove 95% of the color from the river. Another new tactic utilized by Champion was to put pressure on North Carolina politicians and influence the general public in North Carolina. Champion requested an extension of the expired waste discharge permit from the Environmental Management Commission of North Carolina, and the North Carolina officials granted it.

This official action triggered a new twist in the story of the Pigeon River marked by the intervention of the Environmental Protection Agency (EPA). The permit did not meet the standards of the Clean Water Act nor did it meet the EPA's 90-days "submission for review" requirement. The EPA announced that it would intervene in issuing a permit if the two states did not agree on an acceptable permit.

The Emergence of A Social Movement Group In Cocke County

The North Carolina group Pigeon River Action Group had faded due to continuous pressure from Haywood County residents, many of whom were economically dependent on the paper company. Hostility emerged among the local populace toward protest activities in North Carolina because people perceived the group's efforts as taking away their jobs. This view was encouraged and nurtured by Champion officials. PRAG members were rejected in their own community by neighbors and friends. Pressure

increased to the extent that Mr. Mark and his wife received a threatening phone call on Christmas Eve of 1987. To avoid harm, they moved to Florida for short period.

The 1986 emergence of the Dead Pigeon River Council (DPRC) marked a new era in the fight against the pollution of the river. After almost eighty years of pollution, the DPRC led the first collective fight against Champion. The Dead Pigeon River Council was established in Cocke County. The co-founders were college professor and the director of the Newport Chamber of Commerce. These two individuals discussed the importance of cleaning up the river and declared their willingness to pursue this goal. The official birth of the Dead Pigeon River Council was at midnight on December 31, 1986. About 200 Cocke County residents attended the first rally on the main bridge of the city of Newport. On that day, The Tennessee Homecoming Celebration had taken place in Cocke County, and that event matched in spirit the purpose of the gathering. The pre-mobilization process included advertising in the media, distributing flyers, and personal communication. The organizers had planned the occasion and some sentimental activities also took place, such as bell-ringing and speeches that addressed the community's concerns.

The DPRC succeeded in symbolizing a broad community perspective regarding the pollution of the Pigeon River. As Norris-Hall (1988) indicates, the new group did not follow the model of a typical 1960s social movement organization in terms of recruiting people for membership. Norris-Hall (1988) suggest that the DPRC represents an elite group that took their stand on the river out of economic and business motives. But by the following year, DPRC was a symbol for the community struggle against the pollution. Although the official membership list had only 8 names, many residents expressed support for the group. The DPRC received thousands of dollars for legal fees from the local county government. Its organizational structure can be seen in the presence of

the group president, a local businessman, the two co-founders and a strong activist and two other members. Mr. Sullivan, the co-founder of the DPRC, worked as the director of the Cocke County Chamber of Commerce; the office of the Chamber became the headquarters of the DPRC.

Initially, DPRC's plan was to stage year-round activities to increase community awareness. Mr. Sullivan remembers that one of these activities was a Memorial Day. The plan was to construct a memorial wall that included the names of people who had died of cancer believed to be associated with the pollution of the river. As people gathered to view the names, emotions were expressed and some cried when they saw names of relatives or old friends; the whole situation became so emotional that the co-founder himself cried. That moment has been a symbolic expression of sadness that has surrounded the community for a long time. Mr. Sullivan never planned to become a community leader. But he learned to manage and plan activities utilizing his excellent communication skills. The DPRC took the lead in this process, especially after North Carolina officials granted Champion a discharge permit.

The state of Tennessee proposed a water requirement of 50 C.U. for Champion. But on January 14, 1987, the EPA issued a draft permit that Champion announced could not be met. During that period, the DPRC was involved in the issuance of the permit and typical activities included meetings with officials in the state of Tennessee, the EPA, and Champion International. The most effective strategy utilized by the DPRC was publicity of the issue. Local, state, and national media found the story of great interest to the public and the DPRC members were successful in picking their chances to express broad-based community interest. Throughout the controversy over the discharge permit, the DPRC periodically expressed the community view through press releases. But the state of North Carolina, as represented by the governor, pledged continued support for Champion. The North Carolina governor stated on March 14, 1987 that he and his administration would do all it could to

help Champion. Addressing the issue of pollution the governor said, "It is not an environmental problem. It is not much of a visual problem." (The Mountaineer, 3/16/87). DPRC kept the public informed of such official pronouncements.

Champion continued its evasive strategy, challenging the EPA permit as too strict for compliance. Subsequently, Champion filed a suit against the EPA on January 17, 1987 in U.S. District Court, denying the EPA's authority in regulating its discharge. On another occasion, the company requested support from the people of North Carolina, threatening that, if the new permit was approved, the company would be forced to close. This threat stirred controversy in the community. Over 180,000 letters were sent to the U.S. EPA Region IV headquarters in Atlanta requesting that no changes be allowed in the discharge permit. The scope of the controversy was expanded with a November 1987 DPRC press conference that presented evidence uncovered by Greenpeace of dioxin in waterways supporting paper mills similar to the one in Canton. Some members of the group and Cocke County officials then demanded that the Pigeon River be tested for dioxin. Community concerns were expanded then, beyond color unit to include health and safety issues.

After two delays, the EPA held two public hearings in Asheville, North Carolina and Knoxville, Tennessee in January 1988. A "gentleman's" agreement between Champion and the DPRC stipulated that no members of the opposing community would attend the hearing held in the other community. Champion hired a public relations firm to prepare for the hearing. They placed the slogan throughout the region: "Do not let Champion Fall".

Although the Tennessee group members upheld their promise and refrained from attending the Asheville public hearing, Champion arranged for transportation of its employees to the Knoxville hearings. Fifty buses carried more than 2,000 employees to the hearing, all wearing yellow hats. The employees were paid and were given free lunches. This strong showing intensified the confrontational atmosphere. Trust in

Champion, which had before been in question, now changed to hate.

After the EPA and water quality research team found substantial evidence of dioxin contamination in fish and sediment collected from the Pigeon River, Greenpeace participated in posting the river with signs to warn the public from consuming fish. This activity was covered by the media. On September 25, 1989, the EPA issued a final waste water permit to Champion. But, before the end of the review period, both the DPRC and Champion filed appeals opposing various sections of the permit. Appeals necessitated two more hearings, scheduled in 1990 in Newport and Asheville. The permit was finally issued but Champion requested a time extension to the end of a three-year modernization program that is scheduled to end in 1994.

Throughout the legal wrangling, both states were involved in legal disputes regarding rules and regulations. The EPA managed the dispute as a third party and a referee. Generally, people in Cocke County now believe that the EPA has failed to enforce the Clean Water Act of 1972. Champion, challenged the EPA intervention on some of the permit sections, claiming that technology has not yet been invented to allow the company to comply. One of the points that the DPRC challenged in the permit pertains to the measurement of the water in the river. The permit states that Champion tests the water on a monthly average. DPRC requested that Champion be required to maintain a daily average of at least 5.0 mg/1 dissolved oxygen at all sampling points in the stream. Another recommendation stipulates that the dioxin control plan managed by Champion should specify a long term enforceable goal of allowing no fish in the Pigeon River system with detectable dioxin. When CBS Evening News reported on Champion's pollution of the river on January 3, 1990, company officials were so irritated that they issued a special report of "The Wire," the monthly newspaper of the Champion Corporate Community. In the report, Champion challenged every bit of information presented in the CBS three-and-half minute report: "From charges of poisoning the Pigeon

River with dioxin to national television coverage of a downstream village that called itself "Widowville," some of the news media have fueled a firestorm of fear and debate over Champion's presence in Canton, North Carolina. In the face of inaccurate reports and misleading assertions, it is time to set the record straight" (The Wire, January 1990).

Champion accused the media of presenting exciting news without considering the accuracy of the material presented. The 80-year-old tactic was used again as the Champion reporter claimed that the company is in the process of spending $200 million dollars in a modernization program that will improve the water quality of the river. The Company's report denied any wrongdoing in terms of discharging dioxin: "But isn't it still true that the Canton mill's pulpmaking process produces dioxin? The answer to that is yes, as do all bleached kraft pulp and paper mills. But in Canton, tests have been shown that its presence is in such small amounts it has to be measured in parts per trillion for solids and parts per quadrillion for liquids" (The Wire, 1993, p. 3).

After the 1990 hearing, protest activities took the form of preparation for another battle with Champion, the class action suit. Efforts to increase community participation continued through various types of activities. The latest community activity occurred early in 1993 when a Knoxville-based environmental group called for ending the variance granted by North Carolina to allow Champion to exceed Environmental Protection Agency water color standards. The Foundation for Global Sustainability has been active in fighting several local environmental problems. Foundation leaders believe that the variance has been ineffective in resolving the color issue. The question is how the permit allowed Champion to get away with polluting North Carolina from the pulp mill to the state border. Environmentalists asked: "Can Champion continue polluting over 30 of river miles inside the North Carolina border without any question." By such intervention, the Foundation helped to revive the issue and escalate activism.

On March 27, 1993, a coalition of environmental groups from North Carolina and Tennessee organized the first march in 85 years to the paper mill, protesting Champion's continuation of polluting the river. Four hundred and forty five demonstrators began the march from Newport to Canton. Participants gathered in front of the court-house in Newport where speakers demanded the cleanup of the river. A list of names of people who had died of cancer in Hartford and Newport was recited. When the protestors arrived in Canton, they were joined by a group of protestors from North Carolina. The demonstration was a peaceful one and Canton city police offered proper protection so that no violent incidents occurred.

To summarize this section: the emergence of DPRC marked a new era of community involvement through collective effort to counter the pollution. The DPRC had a tremendously difficult task in promoting community awareness. The group jumped very quickly into the controversy over the discharge permit. Buoyed by citizens' support, the group succeeded in catching media attention. Although differences in strategies and ideology arose which caused the formation of a new group, Americans for Clean Environment, the differences were generally tolerated regarding efforts to clean the river. At the beginning of the DPRC, two group members expressed disagreement with adopted strategies. The withdrawal of these members led to the formation of the ACE. The new group was concerned with broader issues related to the environment, such as the clearcutting of forests. But ACE members continued their interest in the river problem and supported community efforts to fight the pollution. Members of the DPRC became experts in negotiation with the EPA, active participants in the permit process, at once well-prepared to present community needs and to promote the cause of the community. Beginning in 1980, Champion International was faced with strong opposition from activists who knew how to embarrass the company and expose its real image to the public. Although these local groups lacked formal

membership and organizational requirements, they were important vehicles in the struggle against pollution.

Community Involvement in a Class Action Suit Against Champion

The third major community response to the pollution of the Pigeon River began in January, 1991 when 2,600 residents of Cocke County filed a $367.9 million class action suit against Champion. The case was presented to the United States District Court for the Eastern District of Tennessee at Greeneville. According to the court's record the charge included the following.

> The plaintiffs claim that Champion International Corporation's pulp and paper mill in Canton, North Carolina, discharged waste water which contains many toxic chemicals into the Pigeon River; that its paper-making process also discolors the river's water and makes it foul-smelling; that Champion's use of the river constitutes a nuisance that unreasonably interferes with their rights as property owners' and that this use is also a trespass, contaminating their land. They seek damages to compensate for a claimed reduction in the market value of their realty and for personal discomfort, stress, annoyance and anxiety associated with Champion's contamination of the river, the lake, and their personal property.
>
> In addition, they seek punitive damages to be shared by the entire class of plaintiffs, for what they allege is willful and wanton conduct on Champion's part, or reckless indifference to their rights and safety. As the record continues "Champion claims that its mill produces a useful and necessary product; that it contributes significantly to the economics of both North Carolina and Tennessee; that it discharges treated waste water into the Pigeon River pursuant to a lawful federal permit; that the chemicals discharged are below levels which present any risk to human health; that any discoloration of the river results from the discharge of natural substances which also do not present any risk to human health; that its processes are in accordance with the state of the scientific and technological knowledge available; that it has complied with industry standards, government regulations, and discharge permits; that the dioxin of which the plaintiffs complain comes from other sources; and that, as a result of improvements to the mill which have already been made, and others which will be made in the future, the discoloration of the river has been, and will be greatly reduced.
>
> Champion denies that its pulp and paper mill unreasonably uses the waters of the Pigeon River; denies that its treated waste-water discharges constitute a nuisance or trespass; denies that the plaintiffs have suffered any compensable losses as a result of its operation of the mill; and denies that the class of plaintiffs and their representatives here today are entitled to any damages.
>
> (U.S. District Court East TN Sept. 15, 1992)

The case was presented from September 15 to October 17, 1992. The jury selection process continued for 2 hours until 8 women and one man were selected to serve. Most jurors were housewives with high school degrees except for the one man who held a college degree. Champion was represented by four lawyers from Chicago, New York, and Knoxville, while the plaintiffs were represented by three lawyers from Tennessee and one from Mississippi. Besides the lawyers, a legal entourage of 25-30 lawyers, paralegals and secretaries came in support of the Champion team.

On average, a number of 7-12 members of the plaintiff's team attended the session every day. The first witness for the Cocke County homeowners was author Wilma Dykeman Stokely, an Asheville, North Carolina native who has lived in Newport for 50 years. The witness said that she first saw the Pigeon River in 1940 and "It was black; it had great pieces of foam floating down it, and it had a terrible odor." She testified that in 1955 she and her husband visited the mill as part of the research for her book "The French Broad." In a discussion about the condition of the river with the chief executive officer at the mill, Stokely testified that the officer told them "well, we cannot justify spending a great amount of money to our stockholders to clean up the river." Finally he said, "We'll clean it up when we're made to."

Although the plaintiffs testified that damages were incurred because of the pollution, the case was controversial because of the legal restrictions. For example, the case had a cutoff date of January 4, 1988, stipulating that any events that happened prior to that date could not be considered. This limitation made it difficult to present all relevant information about the pollution. On another occasion, Champion lawyers objected to Cocke County's lawyers presenting a photograph depicting the amount of smoke coming from the company and the river. On many occasions Champion's defense team requested to approach to the bench prevent the discussion of specific information. Each side of the case brought toxicologists to discuss their assessment of the issue. The witnesses

used many technical terms that might have been difficult for the jurors to follow. Champion's lawyers depended on some technical articles minimizing the effect of dioxin on the population. In the cross-examination, Champion's defense questioned the information presented by a top expert in the field of toxicology. For example, Champion's lawyers brought a report that claimed dioxin was nonexistent in the fish tissues. But the expert testified that the reason dioxin was non-detectable at that level, as Champion's lawyer claimed, was because the measurement that was used to measure dioxin is based on a very low level of detection: if there was a discernable level of dioxin using that measure, it would be disastrous.

In a dramatic move, Champion's attorney insisted that the water in the river was clean and that he would not be afraid to drink it. The next day, a group of eighth-graders from Newport, Tennessee traveled to the federal courthouse in Greeneville and presented a jar full of river water to the lawyer, asking him to drink the water as he said. The lawyer refused to do so. Among the witnesses of the event was a former chief of U.S. Naval Operations who accused Champion International of trying to cover up the dangers of dioxin. "I consider that their conduct has been not only unethical but reprehensible." But a University of Kansas toxicologist testified for Champion that "A person would have to eat about 20 pounds of soil a day from the Pigeon River's banks to ingest enough dioxin to kill a lab rat" (Knoxville News-Sentinel, 10-2-1992).

On September 30, 1992, a clinical psychologist testified that the seven representative plaintiffs suffered from chronic stress from the condition of the waterways. "They are suffering from what is known as a general stress reaction." The witness testified, "Although the seven plaintiffs don't exhibit any major psychological problems, they have a wait-and-see attitude, which is why it's a chronic problem." In responding to the Champion lawyer's question the psychologist said, "These are basically normal people reacting to a stressful situation."

In regard to the plaintiffs' condition, the psychologist said, "the uncertainty of the dangers of dioxin is a key factor in the problem." Whether the stress is caused by scientific evidence of the pollution or the people's perception, the witness said, "their stress is based on what their perceptions are. Their perceptions are based on what they read and what they hear in the community. I would expect, based on my research.. other people in the community and the class feel the same way" (Knoxville News-Sentinel, September 30, 1992).

The significance of this testimony is based on the discussion of the psychological impact of the pollution on the community residents. The description of normal citizens facing a stressful event justifies the plaintiff's conditions. One of the Champion's officials testified that, "The company is viewed a certain way in East Tennessee due to some perceptions as to what transpires in the mill and what the mill discharges." Although the company stated in response to the charge of producing dioxin that "It comes from other sources," the same witness who worked for Champion as a vice-president for environment, health, and safety stated, "Dioxin, a possible human carcinogen, has been detected but not recently." In the final argument the lawyers for the landowners reviewed evidence of the pollution caused by Champion who had ignored these people's complaints and caused different types of damages, with the devaluation of land value among them. The company's lawyer denied any wrongdoing by the mill, describing the problem as only a color problem and labeling the plaintiffs "money seekers" with no real interest in the river.

On October 10, 1992, the judge read the final charge to the jury and provided them with instructions. The jury was charged to respond unanimously on three questions:

1. Have Champion's waste-water discharges since January 4, 1988, constituted a trespass upon the properties of the representative plaintiffs and/or a nuisance which unreasonably interferes with

their property rights?

2. If so, what damages, if any, have the representative plaintiffs suffered since January 4, 1988?
3. Is an award of punitive damages to be shared by the entire class of plaintiffs appropriate under the facts of this case?

After 19 futile hours of jury deliberation over five days, the federal judge declared a mistrial. It was later revealed that, when deliberation started, the jurors voted 5-3 in favor of the landowners. But a single juror swayed three votes to Champion, and the deliberations ended at 6-2 in favor of Champion. Considering the constraints put on the case in rejecting any information or event that happened before January 4, 1988, it was not surprising that the jury did not arrive at a unanimous decision. Experts for both sides presented sophisticated knowledge, difficult for jurors with high-school degrees to decipher. As the lawyers for the plaintiffs stated, "We cannot ignore the past because it is a part of the present."

Many were upset by the mistrial. On October 20, 1992, an editorial the "Knoxville News Sentinel" stated, "Justice was not served by the jury's failure to return a verdict against the paper company." One juror said that she was outraged at another juror's conduct. She claimed the other juror had sided with Champion from the beginning and had even brought a library book to the jury room to read while the others plowed through the nearly 1,000 documents and exhibits. The juror continued, "After looking into the nuisance and trespass on the plaintiffs' property, the jurors became confused; I thought our decision was Champion had to clean up the river." (Knoxville News-Sentinel, Oct. 20, 1992).

Originally, the class action suit was managed by the lawyers. All expenses were paid by the plaintiffs' lawyer. Therefore, the decision of a mistrial was not a pleasant one for them. Champion officials were concerned about publicity from the trial, fearing what might be the result of a second trial. This common concern pushed both sides,

Champion and the plaintiffs' lawyers, to seek settlement out of court. After three months of negotiation, a first settlement was denied by the judge in January 19, 1993. The proposed settlement provided for Champion to pay six-and-one-half million dollars into an interest bearing account which, after payment of the plaintiff's litigation fees and expenses, would be used to establish a charitable fund to benefit the landowners and their communities. The judge based his disapproval of the settlement on two reasons: No money would be paid directly to the plaintiffs; and Champion would be released from liability for all future claims, demands, or rights of action. Such points seemed a surrender of the people's rights and the judge found it unacceptable.

After the disapproval of the first settlement, several plaintiffs accused their lawyers of jeopardizing their stand in order to collect their expenses. The lawyers tried for a second settlement agreement, negotiating with the company some revisions to meet the judge's standards. The second settlement acquired the judge's preliminary approval. It assigns 1.8 million dollars to the landowners' lawyers and 1,200 to each property owner. The latest development in the case came on May 22, 1993, when the plaintiffs met and discussed an appeal of the settlement, accusing their lawyers of not acting in good faith. The landowners invited a lawyer to the meeting who had helped in the preparation of the case the previous year. He accused the plaintiffs' lawyers of colluding with Champion lawyers to reach a settlement.

The class action suit filed by the landowners of Cocke County is an unprecedented case because, after 85 years of pollution, community members as an organized group, took the company to court and utilized the legal system. Although the case did not end in the landowners' favor, it does represent another stage of community struggle against pollution. Since 1980, Champion International has faced mounting community protests taking various forms. The community was virtually left alone in fighting an oppressive and powerful opponent. The political and legal

processes proved inadequate in handling public complaints. The significance of the story lies in the collective action taken by the people to defend their rights.

Summary

The pollution of the Pigeon River is an important part of the history of Cocke County. Throughout the history, residents have tried to reverse the debilitating conditions of the river. Initially they expressed their concern to the paper company and to numerous state and federal agencies. Because of the lack of interest in the problem from these parties, a new community-based social movement emerged in the 1980s. The goal of the movement was a clean river. Dealing with the politics of the problem in the last ten years has caused disappointment and frustration among community residents. That has triggered the third strategy of a class action suit filed by 2,600 landowners of Cocke County against the paper company in North Carolina. In sum, the past ten years represents a new stage in community struggles against the pollution of the Pigeon River.

CHAPTER VII

ANALYSIS

Research in environmental disasters distinguishes between acute and chronic disasters. In the Three-Mile Island disaster, sudden radioactive releases from the nuclear power station ignited community grievances that led to a quick community response. In contrast, the Love Canal disaster was not acute; it represents community response to the chronic contamination of homes as a result of toxic chemicals. The Pigeon River contamination represents a unique type of disaster because the pollution of the river has been continued for over 85 years.

According to Couch and Kroll-Smith's characterization of the chronic technical disaster, the Pigeon River incident can be described as another type of chronic disaster. Uncertainty about the effects of the pollution is an important factor in explaining the longevity of the disaster. Other factors contributed, such as political and cultural factors. In the case of the Pigeon River controversy, the source of pollution is located in one state, and the community that suffers from its impact is in another state; thus the jurisdiction of the two states complicates any resolution of the problem. Since Appalachian communities are generally poor and underdeveloped areas, the emergence of an industry represents a critical opportunity for economic development. The realization of the magnitude of the pollution is an essential component in the study of such a disaster. Accordingly, any analysis of such a disaster should consider these factors in order to reach a more accurate and comprehensive understanding.

This chapter will be divided into three sections: an assessment of the river's pollution; the pollution's impacts on residents; and families' responses to the pollution problem.

In the previous chapter, the history of Cocke County, substantial evidence was presented to indicate the significant pollution of the

Pigeon River. Studies of water quality and dioxin levels in the river revealed scientific evidence of its deteriorated condition. As an EPA official commented, "The problem with the Pigeon River is the mill uses all the water out of the Pigeon River. All of it. This is allowed, industry using all the water out of riparian sources. As for the percentage of water that a user can use, that will vary across the country, that's not a national thing. Champion started out as the only people there; therefore, they used all of the water." (Atlanta, August 13, 1992).

After examining the effluent discharged into the river from the mill, I can assert there have been enough studies to indicate that different types of metals and other substances are present. For example, when dioxin was initially discovered in 1987 by the EPA, Schacher (1990, 1991, 1992) began to assess levels of dioxin discovered in the river's fish tissues. He reported a discernable level in various types of fish. He found that the level of dioxin correlates positively with the size of the fish. Dioxin, 2, 3, 7, 8, TCDD-- a possible human carcinogen--were found in fish tissues taken from the Pigeon River and Douglas Lake. Controversy over the dioxin issue produced broad health concerns among citizens of Cocke County.

Although Champion has consistently declared that dioxin discharged into the river has been reduced to non-traceable levels, water quality agencies in Tennessee still categorize the Pigeon River as a contaminated river. For example, in a March 1992 Tennessee Fishing Advisory issued by the Tennessee Department of Environment and Conservation, the Pigeon River was listed as polluted by dioxin and a warning statement was posted, "Fish should not be consumed." (Figure 8)

Another problem with the effluent is that the sludge is believed to contain measurable levels of dioxin and other harmful chemicals. The discoloration of the river by the effluent makes it difficult for the survival of organisms. Tennessee's Wildlife Agency has protested the

pollution, proclaiming that it "has rendered the Pigeon River unfit" for aquatic life and human recreational uses.

Yet another manifestation of the deteriorating condition of the river is that an average of 212 pounds of fish per acre are found upstream before the mill's discharge point, but only 22 pounds of fish per acre can be found downstream. Residents of Cocke County have been warned against fish consumption. Some have caught fish whose deformities they attributed to the pollution. In summertime, people who travel the area closer to the river can easily smell the unpleasant odor coming from the river. This nuisance has been the norm for the river for almost 90 years.

In the class action suit against Champion, a top toxicologist warned: "This case is about exposure of a big group of people to multiple levels of chemicals. The Pigeon River and its banks will be contaminated with dioxin for generations to come." A wildlife scientist elaborated on the issue: "That's a very small river. I'm not a paper scientist, but I know that paper plants need a great volume of water to conduct their operations. If they had to do it over again they would have never picked that site. Right now, even though this is a pretty rainy summer, they are using all the water. It's impossible to use it and to turn it back into the river and support the river life that is there." When the river leaves Canton, North Carolina its water characteristics are enormously altered. The quality of water is seriously debased. Because of the use of water in paper production, the temperature of water rises substantially, making it impossible for fish to survive. Lack of oxygen is another related technical problem affecting the water quality.

In the previous chapter, a detailed discussion was presented on the effects of discoloration of the river from the chemical effluent discharged by the company. In sum: the dark color prevents the sun's rays from penetrating the water's surface, threatening organisms in the river. Although the permit issued to Champion International for effluent

discharges specifies 50 color units along the Tennessee border, a scientific debate emerged on the meaning of that limit. Champion has announced a four-year modernization program, costing over $300 million, to meet the color requirement requested by the State of Tennessee and approved in the permit.

During the process of issuing the permit, people in both Cocke County, Tennessee, and Canton, North Carolina participated in a controversial debate over the permit. The permit was rejected by both parties, Champion International and the residents of Cocke County. On one hand, residents of Cocke County, represented by the DPRC, felt that the EPA-issued discharge permit was not strict enough, arguing that levels of chemicals and the technical process of sampling and measurement of water quality do not maintain acceptable water quality. Moreover, the permit did not stipulate a required process for Champion's control of dioxin discharge. On the other hand, residents of Canton, North Carolina, who have various associations with the company, believed that the permit was so strict that it might cause the company to close the mill or reduce its production. Either option would cause irreparable economic loss for the community of Canton and the State of North Carolina.

Consequently, both Champion International and the DPRC challenged the permit, utilizing all possible resources. For example, for the EPA hearing in Knoxville, Champion's officials hired a public relations firm to mobilize support for the company and bused over 2,500 workers to the hearings. Cocke County residents who attended that hearing still resent the company's behavior.

Although Champion declared that they did not directly ask Canton's residents to participate in these activities, the majority of people in Cocke County believe that Champion created the atmosphere that led people to act in that way. In the political arena, Champion had put enough pressure on the public in North Carolina to reverse the 50 color unit

standard required by the State of Tennessee. The political message sent by Champion was "Do not forget that we invest in North Carolina's economy and provide job opportunities for over 2,000 citizens." An example of the success of such political maneuvering is seen in the North Carolina governor's stand during this period. Champion changed its image from a company violating water quality laws to a company burdened by the battle between two states.

On the other side of the story, people in Cocke County felt that they had done their part in raising issues and presenting their opposing views, especially considering the lack of resources in the community. Although the State of Tennessee was technically involved in the problem through several departments, Cocke County residents believed that the state's efforts lacked enthusiasm. For example, people compared the preliminary hearings in Asheville, North Carolina on January 14, 1988, to those in Knoxville, Tennessee on January 21, 1988. Many North Carolina top officials, politicians, and administrators attended Asheville's hearing in support of Champion. But in Knoxville only one politician attended the hearing in support of the Cocke County residents. This was interpreted by residents as a lack of official interest in the river issue.

The only occasion on which people in Tennessee felt their politicians' involvement was when Governor Ned McWherter canoed the Pigeon River to assess the water quality. This trip purportedly helped the governor decide to deny Champion a variance from Tennessee water quality laws. After the trip, the governor announced that he had personally canoed the river, upstream and downstream, and observed the differences in water quality and life in the river. He said that the pollution problem was so advanced that he would stick with the 50 color unit standard for Champion to meet at the Tennessee/North Carolina state lines. On most other occasions, residents of Cocke County felt that the support received from the State of Tennessee was inadequate. During

these political processes, the news about the dioxin found in the river aroused people's fears of cancer. Residents of Hartford, Tennessee have since come to believe that the increasing number of deaths caused by cancer correlates with the presence of dioxin in the river.

Mobilization within the small city of Hartford reached its peak in this same period, especially after the media became interested. Hartford residents called their town "Widowville" because of the high cancer rate among men. Their demands for a health assessment resulted in a hasty and inaccurate survey on mortality rates from cancer. But residents were not satisfied with the announced results that showed no significant difference between the city of Hartford's cancer rate and the average rate in the State of Tennessee.

A number of questions were raised regarding the validity of the study, most specifically concerning the sampling procedures. Residents claimed that researchers passed some homes without interviewing their residents. Other questions regarded the reviews of the death certificates of cancer victims. Those conducting the review of these documents had failed to recognize that cancer was not specified as a cause of death in the time prior to the study, making the data inaccurate. Residents were disappointed at the flaws in the study and relied, instead, on their own observations involving a new count of relatives, friends and neighbors who had died of cancer over the previous twenty year period. A list of 116 names was amassed.

Another controversy that took place during the permit period involved the EPA's stand. Residents of Cocke County trusted that the agency's name reflected its objectives: "Environmental Protection Agency." But subsequent positions adopted by the federal agency did not match its title. Because of the enormity of the problem that involved two states, people felt that the EPA would do its job and enforce the Clean Water Act of 1972. For residents of Cocke County, recent historical evidence reflects a substantial reluctance by the agency to enforce the law. EPA

officials responded to public charges in a technical manner.

In response to written questions concerning the North Carolina side of the river, EPA officials believe that, even after the completion of the modernization program adopted by the company, the water will still be polluted. An EPA official stated:

> "The Pigeon River will not meet the statewide water quality criteria for instream color in the North Carolina stretch of the river. The permit allows higher color levels in this part of the river since North Carolina has adopted and EPA has approved a variance for color in the North Carolina segment of the river. The variance was approved by EPA on the terms of EPA's water quality standards. Regulation at 40 CFR part 131.10 was based on the conclusion that the controls necessary to meet the North Carolina statewide color criteria would result in substantial and widespread economic and social impact."
>
> (EPA's response in 04/27/93)

In this response, the EPA admits that a higher color level was allowed by North Carolina and approved by the EPA in direct violation of the Clean Water Act that does not partition a water source into segments with different color criteria. This response also ignores physical laws that hold that anything affecting one part of the water's flowing surface would necessarily affect the rest of the river. In other words, if North Carolina allowed higher color levels in the North Carolina segment of the river, clearly violating the Clean Water Act of 1972, then the impact would affect the river all the way downstream.

Another important implication of the EPA response is its approval of a higher color permit. EPA granted the request to prevent "widespread economic and social impact." A defense for this stance has not yet been provided. One Cocke County activist commented on the EPA, "I really feel sorry for the EPA. I would prefer again, an honest approach. Let them protect the environment, let them go the whole nine yards. I want to see the EPA protect the environment totally, not take into consideration these factors of economics. <u>That's not their job</u>. Their job is to protect the environment. But don't start compromising at EPA's level, they should be there fighting all the way for the environment."

The purpose and objective of the EPA has been to enforce the Clean Water Act. As a political science professor at the University of Tennessee states:

> I don't think it's really up to the EPA to look at it in terms of the big picture. They are simply supposed to enforce the law with respect to the Clean Water Act, and I don't think it's EPA's job to try to balance all these interests out. That's going to affect the amount of political pressure that's going to be brought to bear on them, but they have technical responsibility, and that's to clean up that water, and put the requirements in their permits which are consistent with the law.

In sum, the condition of the Pigeon River in the last 85 years represents a type of chronic disaster. This type of disaster is characterized by longevity, which itself produces a different set of perceptions, impacts and responses. Characteristics of chronic disasters seem to apply to the problem of the Pigeon River. From the beginning, there have been ambiguous perceptions regarding the cause of the pollution as well as the severity of its effect. The context of the event was not accurately considered, whether it was job versus color or profits versus health. Champion has always tried to limit the context to merely a color problem, while emphasizing the economic gains that accrue to the region. On the other hand, community residents downstream have suffered from the physical alteration of the water. When the news of dioxin hit the community, the context changed to that of a potential health disaster. Facts about the source of the chronic disaster were debated for more than 85 years. Observational evidence convinced residents of Cocke County that the river is severely contaminated. Although residents of Canton, North Carolina observe the same physical evidence, especially the strong odor coming from the river, they still deny its potential for harm. As one resident of Hartford, Tennessee stated: "they smell it like money." In sum, the case of the Pigeon River is an example of a chronic technical disaster.

Impacts on Communities and Families

Most disaster research attempts to investigate the impact of the environmental disaster on communities (Erikson 1972; Levine 1982, Edelstein, 1988, Cable 1991), however, no empirical research has investigated the impact of the disaster on the family. The family is the basic unit in society; thus, any effect on the community would be reflected in the family. A careful assessment of the family dynamics during a disastrous event can provide a clear picture of the magnitude of such an event on the family. For example, if a disaster occurs in the community, a general state of stress will be created and felt throughout the entire community. But it might be important to examine how anxiety affects family roles, rules, resources and relationships. In the coming sections, I assess the impact of the pollution of the Pigeon River on the Cocke County community. A following section investigates such impact on the family to see the variations and similarities among families in their responses to such disaster.

Economic Effect

Cocke County is one of many poor Appalachian communities that have suffered historically from geographical and cultural isolation. Throughout the years, this Appalachian community has experienced foreign investments, characterized by a temporary business base that provides jobs only, but no reinvestment of the rest of the profits locally. Residents of these communities have found opportunities only for full time low paying jobs. Other residents have built small businesses to support the outside investors by selling other goods and services.

The pollution of the Pigeon River has caused direct as well as indirect impacts on the community. Most residents believe that, with a dirty river, new investors have not been encouraged to open businesses in the community. Other farming businesses for example have lost contracts with the Bush Canning Industry, because the cannery objected

to the farms' use of water from the Pigeon River for irrigation. In a list obtained from the Department of Economic and Community Development, Nashville, Tennessee, (1993), fifteen business and industrial firms in Cocke County employ more than 50 workers. These firms include Quaker Oats with 709 employers; Falcon Products, 360; Sonoco Products Co., 201; Spring Arbor Distributors, 200; Electro-Voice Inc., 179; and Detroit Gasket, 167. But Cocke County in general has one of the highest unemployment rates in the state. In a report issued by the Tennessee Department of Employment Security in January 1993, (Figure 9) the Cocke County unemployment rate for that month was 20.3% compared with the USA's overall rate of 7.9% and the state of Tennessee's at 7.3%. This statistic indicates that, of 15,080 potential workers in Cocke County, only 12,020 persons were employed, leaving 3,080 unemployed. A review of the unemployment rate of Cocke County in 1992 (Figure 10-11) shows that the rate was to 9.5% in July; 9.8% in August; 9.9% in September; and 9.8% in October. Starting in November, the unemployment rate climbed to 11.4% and to 19.0% in January. This sharp fluctuation reflects the seasonal jobs that people in the community seek in neighboring Sevier County, one of the most visited tourist attractions in the United States with over 11 million visitors every year.

Although Cocke County shares with Sevier County the Great Smoky Mountains National Park, the existence of the polluted river has deprived the community of any outdoor recreational opportunities of its own. On May 9, 1987, professors Bach and Barnett, professors of Economics and Accounting at Walters State Community College, released their economic impact analysis of the recreational benefits of a restored Pigeon River. In this report the authors state:

> Champion's pollution of the Pigeon River is an example of what economists refer to as external diseconomy, which occurs when one firm's use of a resource damages other people who cannot obtain proper compensation.... "Consequently, the river's recreational use is extremely limited, compared to recreational opportunities and appeal presented by a clean mountain river. (Bach and Barnett, 1981)

The authors explain that the marginal social damage (X dollar amount) from pollution is greater than the marginal cost of abatement (Bach and Barnett, 1987: 3). (See Figure 12) The study indicates that the Pigeon River, if cleaned, has prime potential to support recreational activities. "The recreational activities projected for the Pigeon River can be subdivided into the following activities: 1) commercial raft floating, 2) other watercraft sport (canoes, kayaks), 3) fishing, and 4) other general recreation" (1987: 7). After providing a detailed analysis of the recreational activities supported by a clean Pigeon River, the report indicates that "For the period 1988 through 1997, the projected total direct benefits derived from recreational use of a clean Pigeon River are $18,332,803, which averages to $1,833,280 per year." The total economic impact equals $73,331,212, which averages $7,333,121 per year.

Assessing the missed economic benefits from recreational activities alone, residents believe that the pollution in Pigeon River is an economic disaster with a long-lasting impact. Aside from the expected increase in revenue if it were clean, job opportunities would be enhanced and an increase in industrial investments would be established.

The county census for 1990 shows that Cocke County's per capita income in 1989 was $8,574, in comparison to the State of Tennessee's per capita income of $12,255. Cocke County ranks 79 among the 95 counties in the State of Tennessee in per capita income. The estimated revenues of the county for the fiscal year ending June 30, 1993 is $190,271. This income is quite low and is reflected in the county's expenditures. For example, the school system in Cocke County suffers from a lack of jobs for teachers, already low paid in comparison with neighboring counties. Another impact of pollution can be seen in decreases in land values, especially properties closer to the river.

✓ Social Impact

Cocke County has been the state's unruly child. The social history

of the county reveals that, after World War I, the county possessed the unwelcome title of the nation's moonshine-making capital. Being isolated geographically has been a factor in community resistance to outside interference. Old residents now joke about the moonshine stigma along the lines of "We did not bother anybody. We just minded our business." This social explanation of the issue reveals the existence of a unique culture where residents used to manufacture their own products but lacked money for other goods. The economic dimension shows a severe type of poverty in which residents had few opportunities for stable work. Currently, Cocke County produces another illegal product, marijuana, that has added to the county's reputation of outlawed activities. However, Cocke County leaders in the last two decades have been looking for a legitimate avenue of economic development by promoting its educational system and encouraging new industries and investments by emphasizing its advantageous location. Two main interstate highways connect the county to the outside world. Highway 40, built in 1964, crosses the county and Highway 81 starts its journey to the North a few miles from Cocke County's western border. Cocke County has a predominantly white population of 28,398, with only 613 black residents. Total families in the county number 8,483, with an average of 3 members per family.

Of the total county population of 29,141, 25.3 percent live in poverty (Figure 13). Poverty in Cocke County significantly exceeds the 15.7 percent of Tennesseans living in poverty. According to the U.S. Bureau of Census, 1990, Cocke County leads east Tennessee counties in percentage of persons with related children under 18 years living below the poverty level.

Consistent with the lack of adequate health services in the area, Cocke County has a high percentage of low birth weight babies: 9.9 percent (Figure 14). This correlates with a high infant mortality rate of 13.3 percent in comparison with the Tennessee average of 11.1 percent. Women, infant, and children health services in Cocke County are in poor

condition according to the Health Assessment (Level III > 11%). In terms of immunizations and vaccine-preventable diseases, Cocke County also is doing poorly, with only 44% completed (Figure 15). The county ranks fifth among 22 eastern Tennessee Counties in oral health (Erwin, 1991).

In February 1993, there were 2,676 Medicaid cases and 845 Aid-to-Families with-Dependent-Children (AFDC) cases. The Department of Human Services indicates that 2,300 persons in Cocke County are Social Security Income Medicaid Cases. Also, in February 1990, there were 3,082 families receiving food stamps, which represents 7,525 people or 25.8% of the entire population of Cocke County for a dollar amount of $60,537. This high dependency on government assistance programs represents a critical situation for Cocke County; any cut in federal assistance would have a devastating impact. In this community, 5,694 residents or 19.5 percent of the population are over 65 years of age. Data on the social and economic conditions of the county clearly reflect the lack of job opportunities and chronic high unemployment. To place these findings in context, Cocke County has a drastic need for a clean river that could change the economic direction of the community.

Living in a polluted area is reflected in people's feelings toward their own community. One of the families in the community describes the social impact of pollution as "...then there's the problem of the children having to move away because of this fear. We want the best for the children, but we want them home, too." In regard to the way people feel about their own community, the same person explains, "Because of the economics, it creates a lack of pride in your community, when there's something so major there, a river running next to your house, that's so polluted, why trim the grass and plant the flowers and make it a place that you want to live? It is very depressing on a person, so that way it becomes very difficult for people to take pride in their community, to work hard to keep the community together."

The direct social impact of the pollution on county residents can be

seen in the story of Hartford. The small city of 150 residents is the first community in Cocke County that the Pigeon River crosses in Eastern Tennessee. In 1920 Hartford was a growing city with a population of 500, a movie theater, two restaurants, a number of stores, and doctor's offices. After almost 80 years of enduring the impact of the pollution, the population in Hartford has decreased, as families and young children have moved to seek better opportunities. When driving through the small city of Hartford, one can view the devastation in the community, as represented by old and deserted homes and only two gas stations, one small store, and a post office. One example of the social impact of the pollution on the community was the closing of the only school in the city of Hartford. In the 1991-1992 school year, the number of children attending the elementary school dropped to 35 children. The school board decided to close the school and send the children to neighboring communities' schools. Another reason for closing the school was that it is located only few yards from the polluted river. The building was put up for sale but no buyer has expressed interest because of the economic decline in the community. Children who finish high school are forced to move out of the community to seek job opportunities, and that has caused early separation of children from their families.

The Health Impact

A 1991 health assessment of the East Tennessee region by Dr. Erwin of the Public Health Department in Knoxville reveals the health condition of Cocke County. In terms of the natural environment, the report describes Cocke County as suffering from a terrible pollution problem. The report estimates that 1,093 to 3,919 pounds per square mile of waste were discharged to Cocke County air, water, and land in 1989 (Figure 16). These figures indicate the severity of the pollution problem in Cocke County.

Questions raised about the increase in cancer deaths in Cocke County

as a result of the pollution have not been thoroughly addressed. However, the health assessment indicates that Cocke County had one of the highest cancer rates in the region (151) in 1991 (Figure 17), exceeding the state average rate of 143 and the national average of 135. At the same time, rates of death related to heart disease, injuries, and strokes were also high among the counties in the region (Figure 18). These health indicators reflect the multiple problems of a poor economy that the county still faces. Although we cannot draw a causal connection between the pollution of the Pigeon River and the deteriorating health conditions in Cocke County, we can determine that the existence of economic problems was in part created by the pollution. Lack of adequate revenues make it difficult for the community to maintain adequate health services for residents.

Psychological Impact

Studies that have investigated the psychological impact of pollution-related disasters have documented numerous effects on families. The stress literature provides a wide discussion of emotional and psychological conditions developed as a result of exposure to toxic materials. Chronic disasters, as Edelstein (1988) states, are quite stressful. The Double-ABCX model (McCubbin, et al., 1983) shows how perceptions of the risk factor could determine the severity of the stressor. Residents have been aware of the risk associated with the pollution of the Pigeon River particularly since the discovery of dioxin.

Health fears emerged after a number of residents contracted and died of cancer. The lack of resources in the community can be measured in its low standard of education, income, experience, and leadership. Unavailability of resources has hindered families' abilities to adopt an effective coping mechanism for such adversity. In this case, an effective coping mechanism could be viewed as engagement in social activism.

After 85 years, residents believed that Champion had exceeded all decent societal norms and ethics and that the company's quest for profits had led to actions that were immoral. Loss of trust was also dominant among the feelings that residents described. The inability of health and environmental agencies in Tennessee and North Carolina to resolve the pollution problems and enforce the law made residents feel helpless and hopeless. Ambiguous feelings related to the toxic waste materials created a state of general stress in the community. For example, Champion reported that levels of dioxin had been reduced to an insignificant level. But studies conducted in May 1992 by the Department of Environment and Conservation clearly documented the presence of dioxin in the Pigeon River.

> Dioxin (2, 3, 7, 8-TCDD) was found to be present at a level of 0.17 parts per trillion (PPT) in the fillet tissue of a rock bass and at a level of 22.1 PPT 2, 3, 7, 8-TCDD in the whole body of a carp. Additional furan isomers increased the relative concentration to 25.2 PPT in the carp (Denton, 1992 p. 6).

During the course of activism against Champion, Hartford residents perceived that the number of people dying of cancer was increasing. One activist provided me with a list of 178 residents who died of cancer. Hartford is called "Widowville" as an expression of people's anger, fear, and frustration over the cancer they believe is caused by the pollution of the river. A Hartford resident expressed her feelings toward the river in a poem. Her verses summarize the turbulent emotional and psychological states created by the pollution that run through the entire community:

> Oh, polluted old Pigeon as you roll on by
> We ask are you causing our loved ones to die?
> Tho, you've rolled and rolled, for years and years
> We now are filled with heartaches and fears.
>
> For cancer has taken so many,that we now ask why
> What's causing this killer to make so many die?
> Here in our valley it's so quiet and still
> And we're now called the residents of "Widowville"
>
> We've swum in your waters so dark and still
> And caught your little fish with rod and reel

We never feared you unless your waves rolled high
But are you the "Silent killer" of our loved ones who die?
If it's proven you are our killer, will you erase all our fears
And remove all pollution, and run smooth and clear
Or we must go on losing those who are dear
And live with our nightmares year after year?

Family Responses to Water Pollution

One of the main assumptions of this study is that involvement in community activism is a positive and effective coping strategy. Edelstein (1988) investigated the psychopathological impact of toxic exposure and found that involvement in social activism was a healthy response for stressed residents. Activism places an activist in control of his/her experience and leaves her/him less susceptible to the behavioral manifestations of stress. Because the family is the basic unit of the community, it is vulnerable to the health, social, economic and psychological impacts of the environmental threat to the community. For example, effects of economic conditions in Cocke County are discernable in many families. The scarcity of jobs in the community is visible among families that have participated in the study.

In this section I address the study questions presented in Chapter I:

1. How do families and communities perceive the problem of contamination of water resources?
2. What factors determine family response to environmental hazards?
3. What are the different family dynamics involved in both activist and non-activist families?
4. In defining the role of social work as a profession, what are the premises that influence such a role in protecting the welfare of the individual, the family and the community?

Community and Family Perceptions

The historical dimension presented by Edelstein in his Social Process Model explains how individuals, families, and communities are influenced by their histories. In the previous chapter, I analyzed the development of events associated with the pollution of the river. In a small community like this that has experienced 85 years of pollution, people are tremendously influenced by their histories. For example, as people

inherited the pollution of the Pigeon River, stories regarding the prior pristine condition of the river were shared among residents. That resource and its loss to industry became mythologized, an intricate part of local culture. Even people who have kept a low profile in fighting the pollution memorialize the story of the local doctor who drove his car north to Canton to ask Champion's officials to stop polluting the river.

The individual's perception of the pollution impacts his/her family's perception. The family as the basic unit in society projects its perception into the community and the society. In the case of natural disasters such as hurricanes, the loss of lives and property become of national concern; every individual feels the impact of such a disaster. Technical disasters a take different pattern. The suffering of a small community in east Tennessee is not been felt in the Canton community of North Carolina. Because Canton residents depend on the paper company for their paychecks, directly or indirectly, another set of perceptions was developed. The social construction of reality in Canton allowed the continuation of the suffering of people in Cocke County. When people downstream demand that Champion clean up the river, Canton residents are irritated and defensive "This is our community and my family has worked in the company for generations." This common answer translates into a demand for the continuation of the pollution. Not only did Canton's residents ask the residents downstream in Cocke County to stop pressuring the company, but in doing so, they also implicitly requested that Cocke County residents adjust to the pollution.

Lack of mobilization on the pollution problem in Cocke County can be viewed in this context. For more than 80 years, the prevailing value of neighborliness value has meant reluctance to instigate a problem that might hurt one's neighbors. But a new trend in perceptions has appeared. When families in Cocke County were asked recently if they were willing to suffer the pollution so residents of Canton could keep their jobs, the answer was no. This new perception was used by the company to draw the

North Carolina workers into the fight. The same thing happened when the company was pressured by the State of Tennessee, and the company then involved North Carolina politicians in defending Champion. Most residents of Cocke County simply demand a clean river, with no primary interest in closing the company. They believe that available technology could be utilized by the company to reduce the pollution.

Social movement approaches have emphasized the importance of grievances as a mobilization tool. In a period of nine months of my field work, I discussed extensively with families their feelings toward the river. The essential evaluation of these families' opinions, feelings, and thoughts reflects serious grievances about the debilitating conditions of the river. Pent up stress was detected when families described their frustration and disappointment about the continuing pollution. However, resource mobilization approaches assert that grievances are a necessary but not sufficient factor for the emergence of a social larger movement. (McCarthy and Zald (1987). In other words, the pervasiveness of grievances in this community might be a prerequisite condition to supplying grass-roots support for movements. But as McCarthy and Zald (1987) suggest, the essential requirements for social movements involve structural variables.

To elaborate on the absence of real mobilization in a period of almost 73 years (1908-1985), I incorporate the work of Boss (1987). His contextual model of family stress indicates that family perception of an event is mediated by the context in which the stressful event occurs. In the external context, Boss reflects on the historical, economic, developmental, constitutional, religious, and cultural indicators that explain the dynamics of family perception. For example, some religious beliefs might prevent a person from challenging the aggressor and accepting such behavior with no objection. The interpretation of such a context can be seen in people's views that prevent them from suing the paper mill company for polluting the river. Within the internal

dimension, Boss sees the philosophical views of a family as an important factor that influences a family's perception. The philosophical stand of a family is determined by longstanding values, norms, and traditions.

Building on the previous discussion, it can be stated that, because families had not perceived the pollution as a risky or stressful event, their coping strategies chosen in terms of how to adjust to such events, believing that the company would finally resolve the situation. Boss also states that coping patterns may be passed from generation to generation. The two coping strategies identified by Boss are fatalism and mastery. The previous discussion explained that religion, cultural, and historical factors determine the choice of these strategies. When the community started its mobilization in fighting the pollution, the DPRC leaders utilized grievances to promote community awareness. The story of the Memorial Day organized by members of the DPRC is an example of such a strategy. Identifying families and community resources is a step in the direction toward preparing the community for the coming battle. For example, the DPRC was successful in adopting various strategies to mobilize support, transforming mass and elite to sympathy. The title of the social movement organization, The Dead Pigeon River Council, was a very dramatic one, and it drew the media into the process. The well-prepared group organizers gained access to institutional centers and existing networks. With a simple but strong message, "clean up the river," this group gained legitimacy and widespread regional support.

Descriptive statistics show that concern about the river is an essential component of the daily life of families in the community. Of the families included in the sample, 86% believe that the pollution of the river is a very serious problem, and 14% believe that the problem is serious. Table 1 shows a difference between activist and non-activist families in their perceptions of the problem. The activist group held strong perceptions (95.5%) of the seriousness of the pollution; while a lesser percentage of non-activist families (78.6) held the same

perception. Aside from worrying about the condition of the river, families had other types of concern, (Table 2) mostly fear of negative health consequences (22.9%) related to the river. Other concerns pertained to the economic problems that the community faces, such as unemployment. 16.7% were concerned about the stability of available work. The river's pollution generated a sense of helplessness among residents. Because of the longevity of the problem and their formidable opponent, residents believed that government should have had a much stronger presence in the community. They expected the government to respond, utilizing all its resources to strive for a clean river. The fact that Cocke County is an isolated poor community lacking essential resources and a strong infrastructure made it difficult to continue the struggle with a powerful opponent who did not lack the money, expertise, and support to fight back. In assessing the federal government's actions in dealing with the problem of the Pigeon River (Table 3), most residents(94%) believed that the government's actions were inadequate.

As was mentioned earlier, the administration of the questionnaire took place as President Clinton's new term started. Earlier, people felt that the Republican presidency of the past twelve years had not been strong on environmental protection. Respondents were asked to express their predictions of the new administration that had promised support for the environment. The results reveal some optimism regarding the new administration, especially about Vice President Gore's ability to provide an effective solution to the problem. Activist and non-activist families expressed differences in opinion regarding the new administration. While activist families expressed more confidence in the new administration (68 %), non-activist families doubted an effective change in the river's condition despite the new administration (41%).

Cocke County residents have suffered from the pollution of the Pigeon River for generations, always giving Champion the benefit of the doubt. During the course of history, residents experienced much disappointment,

frustration, and anger as the paper mill repeatedly promised to clean up the river. These broken promises were accompanied by the company's attempts to manipulate the political process using every means at their disposal. Not only did people in Cocke County lose trust in the company but they witnessed actions from various agencies and parties that left them with feelings of helplessness and loss of trust in the system.

Results in Table 4 show residents' levels of trust in the various agencies and parties involved in the Pigeon River controversy. Respondents place great trust in environmental action groups, 69.4%, while only 43.3% place such trust in scientists and technologists. Moderate trust is placed in local government, e.g. county officials, local politicians, by only 33%. Ninety four percent of the respondents express little or no trust in Champion International; 75.5 of the respondents express no trust in the EPA; and 55% express little trust in politicians (e.g.congressmen). Variations between the two family groups can be attributed to their differential practical experience. For example, activist families express higher distrust in the EPA, 77%, and Champion International, 95.5% than do non-activist families, 74% and 93%. Their level of involvement with these two parties (EPA and Champion) explains the variation. Another unpredicted difference between the two groups is in their level of trust in scientists and technologists. While non-activist families indicate 93% trust in the scientists and technologists to provide solutions, only 68% of activist families express such trust.

Once again, activists' attitudes reflect their involvement with different water quality experts and scientists who sometimes testify on the low risk of the pollution. Thus, activist families have lower trust in government agencies, the EPA, and Champion International than do non-activist families. However, there has been consistent agreement among them in their distrust for Champion International and for politicians.

The findings indicate significant differences between activist and non-activist perceptions of the pollution problem. Families identified as activist developed a comprehensive understanding of the problem that recognized the complexity of the problem. One activist defines the problem of the river thus:

> This is the most outrageous problem that was inflicted on the poor community. In my opinion, looking on your side of the thing, looking at it from a sociological perspective, it is in a real problem. You don't have good participation in your government. Anywhere you have a pollution problem, you have a corruption problem; it tends to go hand in hand. One process is connected to the other, you have crime, you have corruption, and you have poverty. Crime, however, comes before poverty. In our country that has so much to offer, you have corruption causing crime causing poverty.

Activist families had a clear perception of the "stressor factor," and they articulated their views rationally. By becoming involved in the process, activist families were able to identify their own resources and determine their own roles in community efforts. Motivation is the key element in the activist process, where members of the activist families have strong feelings toward their physical environment and seek the good life for all the families. One activist described her feelings toward her students as a basis for her involvement in community activism:

> My students live along the Pigeon River, that's kind of their front yard. As for myself, I care about my students, and I just feel really sorry for them, that they have to go away from here to get good jobs, and I wish that there was something here that they could work at, and a clean river could mean job opportunities for them.

Determinants of Family Response

The study model incorporates several variables likely to determine family response, based on the review of the literature and the theoretical framework adopted for this study. The independent variables include the following: 1) demographic variables; 2) family relationships; 3) structural variables; 4) environmental awareness; 5) stress and risk perception; and 6) social support. The dependent

variable is family response, defined as the intentional efforts and activities in which the family engaged to reverse the stressful conditions. Utilizing qualitative and quantitative data, I discuss the nature of the relationships among the variables to assess which most significantly affect the dependent variable. Finally I discuss variations between activist and non-activist families in the nature of the relationships among these variables.

Fifty residents completed the questionnaire: 22 activist families and 28 non-activist families. Demographic variables shown in Table 5 include family level of education, residency in the community, age, and living distance from the river. Variables that show some level of association (see Correlation Matrix) with the dependent variable of family response are: family income ($r= 0.23495$; $p= 0.1342$); level of education ($r= 0.26455$; $p= 0.0662$); and distance from the river ($r= 0.2856$; $p= 0.0467$). These demographic variables explain some variation in the dependent variable. In terms of level of education and family income, these variables have an impact on the ability of the family to respond positively to the stressful event. The simple explanation can be placed on environmental awareness, which correlates positively with education and income. According to the study model, demographic variables, income, and education correlate positively with the structural variable, community involvement (respectively $r= 0.3840$, $p= 0.012$; and $r= 0.3627$, $p= 0.01$). Moreover, residency correlates positively with another structural variable, sense of community ($r= 0.3283$; $p= 0.0227$). Participants with higher levels of income and education are more active in the community, as measured by membership in community groups. Sense of community is described as the attitude of residents toward their community in terms of quality of life. People who are born and raised in the community have positive feelings toward the community and such a feeling was not changed by the pollution of the river.

Although family relations is not strongly related to family response, the level of association between social support and family response is found to be stronger (r= 0.2346; p= 0.101). In this context, family support is positively correlated with family response. In other words, level of relationship in the family is not a good determinant of the way the family responds to environmental disaster; however, family support is a significant determinant of activism.

The structural variable, community involvement, shows the strongest correlation with family response (r= 0.5259; p= 0.0001). Community involvement was measured by the number of groups to which a family belongs. Involvement in community activities provides the family with knowledge, skills, and experiences that are useful in understanding problems facing the community. Gaining the appropriate experience might also be important for arranging, developing, and participating in actions that benefit the community. Other researchers might consider such involvement as the building of social networks, considered an important factor in movement participation.

Stress has a positive relationship with the dependent variable, family response (r= 0.4288; p= 0.0228). Families with high level of stress tend to respond positively to the stressful event. In other words, if a family perceives a situation as stressful, the response might be positive as a way to cope with the stress so as to minimize its impact. A similar variable is risk perception, which is associated with the dependent variable (r= 0.2799; p= 0.0489). Risk perception and stress are related with environmental awareness (respectively r= 0.3529, p=0.0119 and r= 0.3573, p= 0.0619). Environmental awareness is positively correlated with the dependent variable (r= 0.37; p= 0.0067).

Interviews with families were also helpful in understanding the determinants of family response to the pollution of the river. Earlier, it was stated that the majority of families in the community perceive the pollution of the Pigeon River as a stressful event. But families differ

in the way they respond to such a problem. In the following section, I analyze and present interview and observational data that also reveal the differences between activist and non-activist families.

// The initial observation of activist families showed a high level of expression of their feelings toward the problem. Sharing their views with others and engaging in meaningful discussion became the norm within these families. For example, activist families are much more interested in knowing what is going on in the community. Following the news about the class action suit in October 1992 became part one of a daily discussion for them. Boundaries in activist families tend to be open and flexible. Their interaction with other systems in the community seems to reflect an open mentality and ability to accept and understand new ideas. For example, the march to the company on March 27, 1993 represented a new tactic. But activist families had debated the strategy before participating. From fear of confrontation with North Carolina people, many non-activist families declined to participate.

Strength in relationships is characteristic of activist families, strength achieved through the development of shared meanings and values within the family. Open communication, respect for each other's opinions, being intimate, and shared expressions of feelings are some elements of solid relationships within activist families. Bloom (1985) refers to the relationship dimension as it includes family sociability, family idealization and family disengagement. A high level of social support is also characteristic of family dynamics in activist families. Internal support is essential, especially when the activist member of the family leaves home and engages in activities which might affect his/her role in the family.

// A positive example of family support is apparent in Jean's family. The activist is a school teacher who directs an environmental group in her school called KARE, Kids Against Wrecking the Environment. In the last five years, Jean has been involved in community activism that

engages school children in the effort. Although Jean's husband is also a school teacher and shares his wife's interest in cleaning up the river, Jean is the activist in the family. A mother of two children, she sometimes has to be away from her family, and that fact made the family support issue salient. Jean's husband states, "She went to Nashville to lobby legislators for two nights, but we made it. We didn't eat as good but we made it." As far as other sources of support for Jean, her husband explains that an important source of support comes from his parents and Jean's parents as well:

> If something comes up that we need to work on, we're sort of joined together and even my parents, they will come in and they will watch and they help. They were real supportive, they all think something should be done. My father was real supportive and he works at a paper mill; he's worked at Bowater's and he was getting ready to retire.

In terms of sources of discouragement, Jean explains,

> You get some support and then you get some who just think you're wasting your time. Those are the cynics that have lost faith in their ability to do anything. They just have given up and think that things will never change, and why are you beating your head against the wall, and you know, you got to let that roll off you like water off a duck's back and go on. You can discuss whether it can convince them or not.

Family support in activist families involve children who grow up learning by observing the meaning of social activism. As Mr. William discussed his views of his family:

> My children are pretty much the same view that I'm of. I have no doubt that they would do everything they can. I think once my daughter hangs her shingle up and starts making money, Champion will start getting a black eye and other polluters will, and my son, he will have his master's degree in education and start to work and he will educate his people, you know the influence of him as a teacher. My daughter is a doctor, and she's going to have a tremendous influence; you know doctors in our society have a tremendous influence on people.

Children of activist parents are likely to be activists themselves because they share the family perspective and learn the political process of social activism.

Social support from the community was also found to be important in

nurturing activism. In the case of formal support, it should be noted that small, poor communities have little to offer in terms of financial support for activism. But other forms of support are important in sustaining a movement group. Mr. Williams assesses community support by saying, "The county and the city have just been unbelievably good. And you always have one instance of somebody straying, but ninety-nine percent have supported us real well." Mr. Williams refers to the community presence during the organized events such as the Memorial Day. Although some literature indicates that family structure is important in determining activism, this view is not supported in this study. The demographic characteristics of activist families do not vary much from non-activist families. Activist families represent the full spectrum. They were of all ages, young, middle-aged, and retired. Both groups have children yet non-activist families have more children than activists. The interpretation of such variation might return to the 'motherhood effect' which holds that mothers with young children have higher levels of concern regarding environmental threats. But such a concern might not necessarily be reflected in social movement participation. Another explanation might be that the more children, the less time for activism. The only important demographic determinant for family activism is level of education. Activist families tend to have higher levels of education (14.5%) than non-activist families (12.4%).

Other indicators include the political ideology of the family. Table 6 shows that the liberal, democratic orientation is more dominant among activist families (15%) than non-activist families (7.4%). In a predominantly and historically conservative community, that might be the most significant finding. The number of activist families that have moved to the community from other states seems to be higher than non-activist families. About 50% of the activist families moved to the community from elsewhere while only 24% of the non-activist families moved to Cocke County from other places. That might reflect the

importance of the different experiences that activist families bring with them.

In summary, social activism is found to be determined by family perception, social support, level of education, and the choice of coping mechanism. The behavioral and social profile of activist families supports the study hypothesis that family functioning is an important determinant of family activism. Activist families maintain strong family ties and have developed strong communication patterns that facilitate the necessary social support. Stress was dominant among most activist families who seem, nevertheless, to adopt a positive coping mechanism to confront the source of stress. Based on the observation that family activism is a healthy response, some requirements are needed for a family to become activist. These factors can be considered the prerequisites for their positive responses to community problems. Basic levels of knowledge and awareness are important for a family to develop an accurate understanding of the problem at hand. For example, when a family is confronted with a stressful event such as pollution without understanding the meanings of pollution and its impact, it might be difficult for them to reach a valid perception. Family interest in the community, which is represented by community involvement, is also a basic requirement for activism. Accessibility of information is needed to reach an accurate assessment of the events.

Boss realizes the cultural determinants of coping, as she defines fatalism and mastery as the basic coping mechanisms. A family can inherit types of coping mechanisms, generation after generation. Consistent choices of coping mechanisms are relevant to family themes. For example, in a small community, people might say "The Williams are fighters" or "the Smiths are private people."

Once a family adopts a positive coping mechanism, some elements are necessary to sustain coping. Social support is a significant factor in sustaining activism. Disappointment and discouragement sometimes result

from a lack of support. Activist families have high levels of motivation, products of cognitive processes and logical thinking.

The Dynamics in Activist and Non-activist Families

To address this issue, I provide examples of family dynamics from each of the two types of families: activist and non-activist. I discuss the negative and positive aspects of family involvement in community activism. Differences among activist families will also be presented in this section.

The Hurburt family consists of husband Charles and wife Julia. Charles has been unemployed for over eight years. He worked sometimes as a rafter, but his vocation cannot be pursued in a polluted river. Julia works as a secretary in a business. Although the couple shares a wide interest in environmental conservation, they sometime disagree on strategies and methods to resolve problems. The couple maintains strong relationships, built on open discussion and mutual respect. Community activism for the Hurburts represents a way of life, and they share their interest with members of different environmental groups in the area. Their personal motivation stems from experiences in their previous community with the Three-Mile Island nuclear accident. They believe that community activism is the way to achieve change. Their past experiences generated distrust in the government and the way it manages environmental disasters. As Julia stated, "I think that it was the health risk that got the local authorities involved. I don't have a lot of trust in state and federal politicians being concerned about local issues. I guess one of the main reason is that I did live about three miles from Three-Mile Island. The response there from the government was- "if you went outside, maybe you want to wear a hat." Julia learned from her past experience that unless families and communities participate in unraveling all the issues surrounding the environmental disaster, local and federal authorities would try to ignore the hazardous problem. "The attitude,

in terms of dioxin from the paper mills, was, don't inform local communities so we don't have to deal with it. And it wasn't until people pushed, the local community pushed, that the state started getting involved."

When the Hurburts decided to move to Cocke County from the North, they had a plan to come to the country side, build their own home, and grow their own vegetables in a quiet community. As soon as they saw the polluted river, they became interested in the issue. Julia describes her motivation in this way:

"Because the river passed through the community, I had to pass it every day going to work. It affects the neighbors and those people who have been there all their lives. I moved here twelve years ago, and at that time we were told about the river, 'Well, there's not anything anybody could do about it.' Then we saw a group organizing around the issue, we became involved with that group, the DPRC,"

Because of the issues surfacing during the permit period, differences among the DPRC members on strategies emerged. The Hurburts were disappointed at the DPRC's stand on several occasions. As Norris-Hall stated, "Differences from the majority of DPRC members concerning ideologies and perspectives led to severe problems for these two members. While perceiving the group to be more economically concerned, the couple's focus tended to be more environmental in nature, and on a global scale, not merely regionally-oriented" (Norris-Hall, 1988, P. 112). Coming from a different community did not keep the Hurburts from being interested in community problems. They brought with them their own experiences that presented a new view for natives residents of the small community. However, variations in perspectives, opinions, and interests became the real challenge. Local activists had chosen a specific perspective on the problem, the economic well-being of the community, while the newcomers viewed the problem from a wider angle.

Disappointed with the DPRC, the Hurburts decided to leave the group.

Norris-Hall comments on the issue: "not being originally from the area they had nothing to lose by saying whatever they felt appropriate. Other members, due to their deep ties in the Newport area, could not afford such outspokenness, still preferring to work within the established system" (Norris-Hall, 1988 p. 127). A perfect example of differences between the Hurburts and the DPRC occurred in the fall of 1987 when they obtained information from Greenpeace about the dioxin and chemicals in the byproducts of paper mills. The Hurburts expected the DPRC to take a hard stand on the issue by announcing the findings to the public and using them to keep the pressure on Champion. However, because the announcement of such findings in an aggressive manner could have led to economic problems for residents who at that time depended on the river for irrigation of crops,, the DPRC showed some hesitation in releasing the news.

The Hurburts decided to leave the DPRC and formed, with other Hartford residents, a new group called Americans for a Clean Environment. Although the new group has expanded its interests to include more environmental issues such as the clearcutting of forests, group members continue to work on the Pigeon River problem. A considerable number of the group's members moved to the area from other communities. That constitutes some differences within activists families in my sample. Variations among the activists reflect different experiences, perspectives and backgrounds.

These newcomers initially experienced rejection from the people in Cocke County, but, as the years passed, they gained trust and established social networks. After twelve years of residency in Cocke County, the Hurburts still struggle with their feelings of being regarded as outsiders.

> We weren't born into the poverty of Appalachia, we might been born into the poverty of the North. We chose this lifestyle, chopping wood, carrying water, and all of that. There is a difference when you have chosen a lifestyle. One of our neighbors laughs at us, saying you live like we used to live and we want

> to live like you used to live. In this particular case, it's not hard feelings. They find it amusing, we find it amusing in a reverse way.

The couple acknowledges feeling of rejection but does not consider it a real problem. Julia explains:

> When I go down to the post office and I'm called a foreigner, I feel like an outsider, but again that same person will help you out with anything he has. I have been here 13 years. I'm going to stay here, this is my community, and I'm going to fight for what the community needs.

One of the negative consequences of being active is presented by Charles who says that some residents view them as "radical environmentalists". Such a label might be negative, but it never discouraged the couple from working for the community. The Hurburts gained self respect from community residents who are aware of their efforts and not biased against the newcomers. Living away from extended family might have been stressful to the Hurburt family, as Julia indicated, "At times I feel isolated, not having family in the immediate area is a difficult thing. You' re not taken into somebody's family"

Involvement in community activism has created a strong relation-ship between Charles and Julia because of the mutual interests. The couple has established a social network of community activists and members of the ACE. They attend local cultural events, and gain self confidence through their accomplishments. The Hurburts have been productive in their work on the environment. They have participated in a number of conferences and workshops and worked with various environmental groups to promote the issue of the Pigeon River. They also participate in the monthly meetings of ACE, planning and conducting several serious activities. For example, the Hurburts obtained a small grant from the Highlander Research and Education Center and produced a 1990 report on the Pigeon River problem titled "Upstream Battle: The Pigeon River."

The Sullivan family is another activist family involved in community efforts against the pollution of the river. Mr. Sullivan is one of the co-founders of the Dead Pigeon River Council, and has worked continuously

since 1986 on the issue. The Sullivans live in Newport. Although the husband and the wife have different views on the issue, they discuss the problem very often. Holding the same opinion does not seem of great concern to the couple. The wife believes that, for a problem of such magnitude, the government should be the main party responsible for reaching a solution. And for a small and poor community to challenge a powerful corporation, it might be very stressful. During the conflict between Champion and the DPRC on the discharge permit in 1987-1989, the Sullivans received a telephoned death threat. The incident was extremely stressful because of the fear about family safety. As Mrs. Sullivan describes, "I was scared, really scared. I was very shaken, and worried that he (the husband) thought the river was more important than I was. At that point in time, I asked him to quit, and he didn't. I understand his position that he can't quit. At times this has affected our relationship, I don't know for how long, two or three days."

Mr. Sullivan describes one of the negative impacts of activism, but the experience in itself represents a major challenge to family relationships. The husband, who has a strong dedication to the fight, is faced with the impact of his involvement. Mr. Sullivan knew that the purpose of the death threat was to intimidate him by jeopardizing the safety of his family. The couple remembers the incident vividly and recalls that they managed to resolve the problem by discussing the issue and searching for support from friends and relatives. The practical solution they devised together was to contact the FBI, who subsequently provided security measures to protect the family.

High involvement in activism requires time and energy that could have been expended on the family. As Mrs. Sullivan explains, "Sometimes I felt I had all these problems and he was off with the river and not here to help me, and that type of thing." Mr. Sullivan acknowledges his wife's concern: "Sure it has, I'm not here when she really needs me for things and I hear about it when I get home. Sure, she complains about

having too much to do. I hate to put all my energy in on the river but some days I do, and I'm zapped when I get home and I don't feel like staking the tomatoes or doing things like that, or working with the plumber or getting somebody here to fix the range when one of the burners is out."

This problem of being away from home for extended and frequent periods has been described by Louis Gibbs in the Love Canal Story (1978). Performance of roles in the family is an important task, and the failure to fulfill such a task affects the quality of life of the family. Activist families bear the burden of facing problems within the family. When a family believes that social activism is the only solution to community problems, a plan has to be made to incorporate changes in the family dynamics. Adjusting to the absence of the activist member requires changes in role assignments within the family. However, the activist family that succeeds in achieving such a change gains the experience of adjusting to new life situations. Social support becomes essential in this context, for both the activist members and the family members who share the burden of fulfilling the activist's role. A family in that situation could rely on internal support from the family or on support from other systems such as friends, neighbors and community members.

Family activism can become a way of life, impacting family interaction. For example, Mr. Sullivan's work on the river has created many tense and provocative situations that increase his frustration. But Mr. Sullivan always tries not to bring such issues into the home environment, "I don't bring it home because she (the wife) doesn't like to discuss it so I don't discuss it with her. I think, however, that we are a happy couple. She's threatened to leave me, or put my clothes out by the fish pond, but she hasn't done it yet. There's a point, I know, when she would." Activist families maintain a limit on how much pressure the family can manage. The pressure could be in the absence of the

activist member or in the time taken within the family to discuss problems in the community. But managing the stressful event strengthens the family relationship. Such a notion is described by Mrs. Sullivan, "We don't get to do a lot of things together for fun because I have my mother and I have to stay here a lot, which means we don't get to do a lot of things we used to do anymore. We are pretty much a happy family. Of course he's made a lot of friends out of this thing."

Frustration and stress are common psychological outcomes that emerge from participation in community activism. With a problem like the Pigeon River with multiple factors involved, activist leaders easily became identified and experienced the full force of the pressure. Mr. Sullivan explains: "The Dead Pigeon River Council has taken all the heat for the rest of the community. The elected officials haven't taken any heat, because they pushed us out front to take the heat because they don't want to have their head on the chopping block." Mr. Sullivan does not complain about his position because he is committed. However, he feels that sometimes the burden is too much to manage. He has created his own support system within the community: "I manage pressure by talking to others or just keeping it to yourself. There would be a time however, that I would be real fearful and I could call Mr. William, and he would say, "Hey, it's really not that bad, come up here, let's go to lunch. Mrs. Woolf, for instance was a real pillar of support of our group. If I ever got to the point where I was frustrated and angry and scared, I could call Mrs. Woolf at Hartford, and arrange to run up there and take thirty minutes, and we could talk it out."

Support from the community represents another important factor in social activism. Considering that Mr. Sullivan is one of two community leaders experiencing most of the pressure, community support provides the encouragement and assurance they need to continue the difficult task. "The community basically would support me, and they have. This is probably one of the best efforts to unify this community, as far as

solidarity of the effort. We're a pretty cohesive community now."

To illustrate differences between the two activist families, a number of points will be presented. First, differences between the Hurburts and the Sullivans exist in their ideologies and strategies for dealing with the pollution of the river. While the Hurburts believe that the pollution of the river represents a real threat to the community, they also have a much wider interest in global environmental issues. The Sullivans have the same concern but with a strategy of working through the system by challenging the permit and using the court to assure peoples' rights. In both families, concern about the river is clear. Differences in perspective might stem from the past experience the Hurburts have. They came to the community 13 years ago, but they are still perceived as foreigners. That has not been a barrier for working in cleaning up the river. The Sullivans are natives in the community, so they do not face the same problem. The Sullivan family does not represent the mainstream of activist families because they have taken the lead in the issue. Not every activist family has received a threatening call, and the Sullivans only experienced it once.

Similarities in the families include strong family relationships, strong support systems and open channels of communication. The experience of being active has added another dimension to their family lives. They have been exposed to stressful situations and they have adequately managed to cope with stress. Both families are proud of their work and are highly recognized for their efforts. They have a goal, a respected one that creates a positive meaning in their lives. These families have successfully managed to deal with stress and became able to adjust to these situations. Despite differences in ideology, both families participated in the community march to the paper mill in March 1993.

In comparing activist families to non-activist families, it is important to consider the nature of the problem. The historical review

of the community indicates that Cocke County is a small, isolated, poor community in the Appalachian area. The Pigeon River has been polluted for over 90 years. People have witnessed the manipulation of Champion generation after generation. Frustration, stress, disappointment and anger are common feelings among most of residents in the community. Non-activist families hold different views on the issue from activist families. While some people believe that nothing will be changed because the company is such a powerful opponent, others believe that it is not even their responsibility to try to change things-- it is the government's responsibility. Fatalist feelings are strong among non-activist families: "You cannot challenge Champion, they have the money." The third group of non-activist families have some association with the company. They believe that the river needs to be cleaned up, but they do not want to challenge the company for fear of causing loss of jobs or because they think that the company has already changed its attitudes. Lack of a clear perception of the problem might have affected some families' view of the polluted river as a threat to them.

// In a poor community such as Cocke County in which many residents do not have a stable or high paid jobs, most families are concerned about fulfilling their daily needs. Availability of time might become another obstacle to community activism. Some families have adopted a low key profile or a wait-and-see strategy. They acknowledge the problem but prefer not to become involved, fearing the consequences. This fear reflects a sense of insecurity in being an activist family. Because the company has in the past challenged community efforts on different occasions, some families are intimidated by the company. These conclusions are based on a number of interviews with non-activist families.

The Jones family is a non-activist family consisting of husband, wife, and two young children, 5 and 8 years old. Mr. Jones is partially disabled and does not hold a job. Mrs. Jones works as a waitress in a

restaurant in a neighboring county. Of primary concern to the Jones family is a stable income. The wife travels almost 50 miles each day for work. Mr. Jones assumes major responsibility for the children. The pollution of the river has affected the Jones family to some degree. Scarcity of jobs has made it difficult for the wife, who is out for most of the day. Frustration with Champion is obvious in the Jones family, who lives in a rented house on the river. The Jones' perception of the pollution is summarized by the wife's statement, "It's hazardous to your health, and it makes you sick just to smell it. So I think we should put a stop to it. The dioxin causes cancer, and it also makes people sick and it stinks so bad it makes you sick."

Living close to the river, the Jones see it every day and are bothered with its odor. They are afraid to let their children get close to the river. The family follow the events surrounding the river. During meals, they very often discuss the problem. The mother feels the children's frustration as the youngest, a third grader, asks her many times "why do we still live here, there is nobody around." They live there still because the wife does not want to leave her parents. When asked about their effort in fighting the pollution, the husband said, "We would become involved in fighting the pollution if we can get something done." He would join the movement if more people would stand up for this and help fight Champion.

Another family, living 700 feet from the river, finds it "outrageous" for the river to continue to be polluted. The McGee family believes that the problem of the river will be resolved when "Big corporations stop being greedy. All they think about it is money. They have no feelings about all the damages and death they cause." The McGees perceive a grievance: "Our children will grow up around the river. We own land that joins it! It is right in our front yard, and we hate the smell!! We do not believe that the Lord intended for it to be murky and smelly." The couple and their children share the same belief. The youngest son was

upset when his school, the only school in Hartford, had to close and he was transferred to school in Cosby, three miles from his home.

The family's sense of home has been disrupted by the smell coming from the river. But they believe that a solution for the problem could be reached if "the federal government refuses to respond to special interest groups and proceeds to do what is best for mankind." The McGees believe that it takes more than the people's interest to correct the problem. The longevity of the problem causes people to lose interest and optimism. But the McGees hold in positive regard the activists who sacrifice their own time and energy to fight the pollution: "Without interested individuals who care about the future, there will be only a land of waste left to our children." The family does not lack perception or understanding of the problem, but, when asked about participation in community activism, they replied, "Maybe we could make a difference. It might be hard but anything worth anything is worth fighting for. I believe everyone living around it should be involved. I was personally asked to get more involved."

For a family of this type, participation in community activism becomes a matter of structure. The McGees are a typical non-activist family. They have the interest and concern, they follow the problem, and they highly value community activism. Agreement on the river issue is high between wife and husband. During the weekend, the husband sometimes takes the children fishing in a small creek 15 miles from home, and that in itself represents a stressful situation, when the family can not fish in the river a few feet from their home.

Most non-activist families indicate that fighting the pollution requires energy and time and they already feel overwhelmed by their own lives. The common belief among these families is that community efforts will not be enough unless the government take a drastic step to enforce the laws on the violators. Anger and resentment are also common among these families. "We should have arrests of people littering and

polluting our country." But these views reflect only an emotional response to stress. Some of these families express sarcasm in their opinions about how the problem will be resolved. "The Champion industry pollution will be resolved when an earthquake fells it or causes the river to flow backwards."

Such a comment reflects a sense of desperation, bitterness, and lack of optimism. Generally, families are suspicious about the reason for the continuation of the problem for such a long period of time. They feel that the pollution is obvious, the law is clear, and the agency that is responsible for enforcing the law is aware, so why has the problem not been resolved? It might be a conspiracy that holds the entire community hostage. This frustration and anger were explained by one family member, "I feel that we as a people were sold out by the bribery of officials at all the levels of government and the judiciary process. An unfortunate situation that exists in every country even the U. S. Those with money influence power for their own purpose and not those of the masses."

The period between 1980-1993 has been viewed as the most critical time in the history of the Pigeon River controversy. During this period, community groups were formed and the fight for a clean river grew to an unprecedented scale. On different occasions, especially during the dioxin discovery, many community activists demanded scientific studies to assess the conditions of the river. Although community residents have had unpleasant experiences with one of the very few studies that have taken place, the majority still value research. In their perception, valid research will clearly reveal the deteriorated conditions of the river and its impact on the community.

Table 7 includes respondents' views of the type of research study needed for their problem. Participants do not believe that every type of research is helpful. This may reflect their familiarity with certain fields of research. For example, survey results show that community residents are unfamiliar with social and psychological studies and how

helpful that type of study might be to their problem. Types of studies that participants believe are needed and relevant are: health assessment 66%, water quality 62%, risk analysis 54%, economic assessment 50%, and social/psychological studies 24%. Differences between activist and non-activist families appear the ranking of research in terms of importance. While activist families rank needed research as water quality, 64%, health and economic assessment, 54.5%, and risk analysis with 61%, non-activist families believe that health assessment should be at the top of research needed, 75%, followed by risk analysis and water quality assessment with both at 61%. Variations in ranking between the two groups suggest different experiences and expectations. Activist families were outraged by the health assessment administered by the Tennessee Health Department, which showed no significant difference between the rate of cancer in the community of Hartford and the average rate for the state of Tennessee. A number of questions were raised about the methodology adopted by the researchers. That experience has left doubts among activist families of the ability of research to reflect the reality of community conditions.

/ In an attempt to draw a psychosocial profile for the community residents with an emphasis on the two family groups, their political affiliation can be an important dimension to consider. The historical facts indicate that the political stand in the Appalachian area tends to be Republican. However, during the period of community activism, many residents of Cocke County concluded that the Republican administrations of 1980-1992 had not been responsive to the community problem. That created doubt about maintaining loyalty to a political party that ignored people's needs. A clear example of such political controversy occurred when then Vice President Bush was invited by Champion to spend a vacation at the company reservoir upstream of the paper mill. This incident triggered community disappointment with an administration already known for their pro-business position. Consequently, a shift in party

affiliation appeared in the last presidential election in November 1992. The results of the voting in Cocke County show 34.9% of the registered voters voted for Clinton, 52.9% adhered to the Republican party and voted for Bush, while a noticeable percentage, 11.2% of the voters, voted for Perot.

The preceding demographic information was presented to suggest a social profile of community residents, both activist and non-activist. Participants' views, opinions, and perceptions of the problem of the Pigeon River were discussed. Variations between the two family groups were presented with some interpretation of the reason for such variations. These interpretations utilize information gathered during the field work as well as results of the questionnaire.

Social activism seems to be the only effective solution for a community to face environmental threat. Families involved in such activity might face a different type of stress. Although activist families have suffered from stressful experiences such as spending time away from their family and being pressured by Champion supporters, social activism has significantly helped these families reduce other tensions. Activist families have in fact gained from their experience in many ways. Self respect, personal growth, self actualization and communication skills are some of the things that they gained. Other benefits could be seen too, like acquiring community support and admiration. Some families have expressed directly their frustration and disappointment, especially at the way the Champion company has dealt with the community for more than 80 years. Activist families, most of the time, have one member as the activist and other members as being supportive. But activism is a strong reflection of family dynamics, where the other family members share the experience, both its positive and negative consequences.

The Role of Social Work in the Contaminated Community

The last study issue deals with the moral and ideological premises that control the role of the social work profession in a new area of practice. Social work knowledge of environmental disasters is limited. As a result of the mounting increase of incidents of both natural and technological disasters, the profession can no longer afford to ignore the area.

The multiple factors involved in disaster events require the profession to research this new area using existing research as well as conducting new studies to explore the problem from different angles. For example, differences between natural and technological disasters must be considered in the attempt to draw the lines of interventions. In the case of chronic technical disaster, new sets of variables intervene in the processes of determining the way social work can effectively advocate and help victims.

The premises that guide social work roles stem from its historical obligation toward the welfare of the individual, the family and the community. A community that faces the challenge of disaster is in great need of support. Social work is accountable in helping a community in its struggle for social change. Another premise is social work's obligation to protect the community against unethical practices or organizations in the society (Macht and Quam, 1986). For a profession that believes in the right of every individual in the society to maintain his/her personal freedom, it is important to realize that such freedom includes protection from unjust practices.

Technical disasters have a direct impact on people's well-being. They threaten the safety of the individual as well as his/her personal freedom. When a company pollutes water resources, their actions represent not only the potential health risk, but also the community's deprivation of a public resource. Aside from these premises, social work has a responsibility to provide adequate care for people who are

suffering from stressful events. This stand is based on the ethical responsibility of the profession toward clients.

The role of the profession toward communities that suffer from environmental disasters has not been thoroughly delineated. However, the overall guidelines of such a role can be seen at two levels. On the micro level, individuals that suffer the stressful event are primary target clients. Assessment of stress, uncertainty and fear of potential risk requires a professional intervention that aims to alleviate symptoms as well as provide the client with tools to deal with the new situations.

In this study, evidence was presented on the impact of chronic disasters on the family. Understanding these risk factors, represented by social, economic, health, and psychological impacts, is essential for intervention. An activist family that faces changes in roles and family functioning are in need of adjustment to these changes. In situations where involvement in social activism represents problems for family functioning, intervention might be critical for the family to learn new patterns of communications. In the meantime, families that suffer from lack of resources or financial instability might need professional help in order to identify their own resources and work to promote these resources to sustain the family.

On the macro level, the role of social work is of great importance. Considering the impact of the disaster on the community is an important task for the profession in order to draw an effective intervention plan. Educating leaders on various strategies is critical to promote community activism. Working with different environmental groups might require a training program for potential members to learn new skills such as planning, negotiating, mediating, advocating and communicating. Community development is another important area, especially in situations where the community lacks resources as a result of the disaster. The suggested social work role is based on the findings of this research project, but it does not provide a comprehensive strategy for the

profession in this new area.

In summary, this chapter discusses the impact of the pollution of the Pigeon River on the community of Cocke County. Evidence is presented on the impact of pollution on the individual, the family and the community. In an attempt to address the study questions presented in chapter one, I utilized date from field work and survey. Families' perception of the pollution of the river is considered important, since it explains reasons for community activism. Variables that determine family response to the contamination of the river are presented. Social activism is found to be determined by essential factors such as family perception, social support, level of education, environmental awareness, stress, and risk perception. Another variable that shows a unique impact on the dependent variable is community involvement. Families that participate in various community efforts are more likely to respond positively to a pollution problem. Based on this finding, a family who participates in community meetings is willing to sacrifice some of its time and energy to community work. Community involvement can also be viewed as a structural variable in terms of the experience obtained from mobilization activities with different groups. For example, when a group works in fund raising, many experiences could be gained by arranging activities, establishing communication, and making important decisions.

The behavioral and social profile of activist families supports the study hypothesis that family functioning is an important determinant of family activism. Activist families maintain strong family ties and have developed strong communication patterns which facilitate the needed social support. Stress is found to be a dominant factor among most families who seem, nevertheless, to adopt a positive coping mechanism to confront the source of stress. Based on the observation that family activism seems to be a healthy response, at least some particular requirements are needed for a family to become activist.

Non-activist families tend to have the same level of concern as the

activist families. However, the nature of the pollution is a very important factor in determining response to it. Chronic technical disasters have long lasting impacts, and, in a community that is polluted for over 90 years, many people feel helpless. Lack of resources is another factor, and it is clear in this case. In a poor mountain community of Appalachia, isolated culturally and geographically for centuries, people's ability to fight stressful events is hindered for many reasons. Non-activist families have inherited a sense of fatalism, and they doubt their ability to change stressful situations.

Fear of such a powerful opponent as Champion is found among some families. Other non-activist families believe that fighting a Canton neighbor contradicts their personal values. Association with the company in any way becomes an obstacle to activism. Another common factor that affects families' ability to respond positively is its concern about life responsibility. Although most families in the community are concerned about the pollution of the river, the majority of them are trying to sustain their families in a community that lacks job opportunities. Accordingly, a common trend among these families is a wait-and-see strategy.

In general, this research finds that community activism is the most effective response for a community in order to fight the pollution of water resources. Because of the failure of the system to respond adequately to curb water pollution, community activism represents the public pressure needed to force solutions. Pollution of water resources represents a challenge to poor communities. Public pressure becomes the only available weapon for the community to create a public outcry to fight unfair practices of industry. Defending the environment is no longer the role of professionals, it becomes the responsibility of the contemporary family.

CHAPTER VIII

CONCLUSIONS

This study has focused on the impact of the 85 year pollution by the Champion paper Co. of the Pigeon River on the families of Cocke County, Tennessee, and the differences in familial response to the problem. Both extensive participant observation and a structured survey have been used to collect data measuring the impact of the pollution and differences in family response. The Double ABC-X Model, the Social Process Model and resource mobilization approaches have informed this study. Data document the extensive consequences for both the community and the families of the continued pollution of the Pigeon River. Activist and non-activist families are aware of the impact of the pollution on their lives. They differ on some variables including level of education, level of stress, level of environmental awareness and the degree of community involvement. Non-activist families lack some of the resources that are crucial for family activism such as available time. They tend to be more fatalistic and less optimistic about possible changes. Few demographic variables differentiate the two groups.

In the previous chapters, the main focus was on the investigation of various factors influencing family response. To achieve this task, I established a theoretical framework that guided the research in assessing the multiple dynamics involve in the context of the pollution of water resource. In this chapter, I first provide summary of the study. Finally, I offer my reflections on my two years of work in this project. My personal assessment reflects the reality of a community that suffers the effect of a man-made environmental disaster.

Summary

Increases in the use of chemicals in industry in this century has led to a serious problem in the disposal of byproducts. Industries have

discharged byproducts into the land, the air, and water. Statistics show concurrent increases in instances of birth defects, cancer, disabilities and property damages. Researchers have documented evidence of the economic, medical, social and psychological impacts of such problems on the individual, the family and the community. Accordingly, to understand the problem of environmental hazards, it is important to consider the social, economic, and political dynamics of the community. Rosenbaum argues that most ecological ills are the products of several factors in various interacting combinations. Therefore, simply relying on laws and regulations to resolve the problems of hazards waste is an inadequate and insufficient strategy.

The areas that have suffered from contamination of water resources are frequently characterized as poor and underdeveloped communities. The rural Appalachian area has taken its share of the pollution from modern industry. Throughout their histories, the poor mountain communities of Appalachia have witnessed the invasion of outsider investors who came in search of raw materials. Industries established in the communities provided needed job opportunities for local residents. However, these industries are responsible for the degradation of the environment.

Cocke County is located in eastern Tennessee. It is a small poor community that has suffered the pollution of its water resources for long time. The Pigeon River, which originates in the mountains of North Carolina and crosses Cocke County, Tennessee, has been polluted since 1908 by Champion International, a paper mill located in Canton, North Carolina. The paper company uses all of the water of the river in production processes and returns it in a deteriorated condition. Water quality studies of the river have indicated high levels of metals and chemicals in the water after being discharged by Champion. Changes in water characteristics are manifested lack of oxygen, high temperature, dark brown color and a rotten-egg odor. Studies have found dioxin, a carcinogen, in the fish tissues in the river.

Three major strategies have been utilized by the residents of Cocke County in their fight against the pollution. At the early stage of the pollution, representatives from the community complained to the company officials of the pollution. But the company has continuously denied any harm to residents and promised new projects sure to reduce the pollution. At the same time, residents sought the assistance of different federal/state agencies in order to reverse the devastating conditions of the river. Such a strategy has accomplished little. Grievances were common among community residents, inherited generation after generation. The failure of the company to fulfill its numerous promises to continuing challenge to community interests resulted in the adoption of a second strategy of political activism. A new social movement organization (DPRC) emerged during the 1980s to unite the community effort in fighting the pollution. During this stage, the problem of the river was taken over by the EPA, the agency responsible for the enforcement of the Clean Water Act 1972.

The EPA issued a discharge permit to Champion that corresponded to the water quality standards of the State of Tennessee. However, the permit was challenged by the DPRC on the grounds of technical limitation to achieve clean water. Because the problem involved two states, two political jurisdictions were involved in the process. Community experience in dealing with the permit issue reflected a deep sense of frustration, anger and disappointment. People in Cocke County believe that the EPA is not effective in enforcing the law, allowing the company to continue polluting the river. Findings show that most families have lost trust in the EPA because of the insensitivity of its officials to cultural meanings of the small community. Families believe that it does not require a scientist with a Ph.D. degree to assess the pollution of the river because physical evidence alone is sufficient: the unnatural dark brown color, the acrid smell of the river and the absence of animals, fish, or insects around the river. Although environmental

groups in the community have been forced to wage a long battle with such a powerful opponent, social activism has continued to be the only strategy that puts public pressure on the company.

The third strategy adopted by the community is the utilization of legal processes to force the company to accept responsibility for the pollution and to compensate residents for the devaluation of their properties caused by the pollution. So far the legal processes have been insufficient in assuring residents' rights. Aside from the economic deprivation caused by the pollution, community residents expressed their disappointment in the company's attempts to suppress peoples' rights relying on its abundant corporate resources.

To investigate a problem of such a complexity, a rigorous methodology was used to capture the multi-dimensionality of the problem. The family was the unit of analysis in this study. Such a method is based on the assumption that responses to environmental disasters is determined by many factors that evolve through the family. Activism as a family response to the contamination of water resources is considered as a positive coping strategy that reflects the new roles of the contemporary family in defending its well-being. To collect data, a field work methodology was utilized for 9 months. During this period, I travelled to Cocke County 2-3 times a week to conduct interviews, review files and documents, observe activist groups, meet with officials and local politicians, consult with professionals and experts, and administer the survey. After about 500 hours of field work, data analysis includes both qualitative and quantitative data.

The findings indicate the tremendously stressful impact of the pollution on the families who participated in the study. Most families believe that the pollution of the river has affected their lives in both direct and indirect ways. The high rate of unemployment in the community represents difficulties for families in meeting their financial needs. Total dependency on state/federal social programs by families is

reflected in the number of families that receive food stamps and AFDC assistance. Deterioration of health and educational services is apparent because of the low income of families in the community. The review of the county budget shows a drastic lack of revenues and a weak infrastructure in the community. Psychologically, stress is common among families. Loss of trust, frustration, anger, and disappointment are caused by the lack of a solution for the pollution problem. Families express their loss of pride in community because of the stigma attached to the pollution. Families express helplessness and pessimism in finding solutions for such a problem.

Most families believed that the pollution was a serious problem. Coping with the consequent of stress took two major strategies. Responses to the disaster include: acknowledgement of the problem, expression of personal feelings, writing petitions, participation in community meetings, involvement in litigation, officially joining a social movement, and adopting a leading position in the social movement organization. This categorization of family responses helps in understanding of the different levels of involvement and intentional efforts adopted by these families to reverse the stressful situation.

Findings indicate that variations in family responses are determined by a number of significant variables: family risk perception; level of education; environmental awareness; level of stress; social support; pattern of family relationships and family involvement with the community. Other factors also contribute. For example, cultural variables are important in describing family perceptions of the pollution. While some families believe that the company should be given every chance to correct its conduct, others believe that taking the company to court has no benefit. Some families believe that the company has changed its attitude in the past few years and is willing to correct its mistakes.

Other non-activist families adopt a wait-and-see strategy because of

their beliefs that challenging a powerful opponent can achieve little, especially in a community that lack resources. In general, families expressed their anger and resentment of the federal agencies believing that a problem with such magnitude should be handled by the government to avoid the stress generated by challenging a powerful opponent. Families that have no interest in fighting the pollution are found to be associated with the company in different ways. Activist families are aware of the problem and hold a clear perception of its impact on the community. These families have higher levels of education and are politically motivated to fight the pollution. Activist families have suffered from the stress of their roles as activists, being frequently absent from the family and being perceived as radicals. On some occasions activist families have been the target of direct threats. However, these families have been strong on relationships which generate the adequate level of social support. Coming from this experience, activist families have become successful in dealing with stressful events and thus avoided many negative emotional and psychological consequences. These families have gained self-respect, confidence and became proud of their own achievements.

Reflections

After nine months of working with the community of Cocke County as an international student, I have come to question my own thoughts and belief system on the issue of democracy. Being impressed by the democratic system in the U.S. which constitutionally assures every individual's rights, I was puzzled by the existence of a problem that caused the suffering of a small and poor community. Does it indicate the failure of the democratic system to protect the rights of members of the society? Families revealed to me their recently formed disapproval of the system and their feelings of being betrayed by their own country.

Having grown up in a developing third world country, I have the

advantage of comparing the two societies. A community like Cocke County is an example of a third world underdeveloped community. In reviewing the characteristics of third world community, the reader will understand the reason for such analogy. A third world community has a weak infrastructure; high unemployment, lack of adequate health services, a high rate of infant mortality, high dependency on social assistance programs, and high rates of illiteracy and crime. Because Cocke County has suffered the consequences of pollution for over 85 years, it has been denied a chance for economic development. Consequently, Cocke County exhibits the characteristics of a third-world community.

A small community like Cocke County that lacks indigenous resources must benefit from available resources brought to the community. In other words, classifying residents as native or non-native does not help the community. Newcomers have their own experiences, perspectives and views that can help to unite the community in its efforts to fight the pollution. Working out differences should be accomplished through open discussion and the maintenance of communication among various groups inside as well as outside the community.

Solutions for the pollution problem might be unattainable; however, the findings show that the continuation of social activism raises the level of public pressure on the industry which could lead to future resolution. That was obvious when an official in the EPA was asked about the DPRC, he stated, "I think they're doing fine. Without groups like that there may not be anything going on now. If these groups had not existed to bring the pressure on EPA to do something here we may have not done anything." The role of community activism is crucial as one Cocke County officials stated "We have started the fight and we will never stop it." Most families believe that through education, future generations will force the issue to solutions and improve the community. One activist who supervises a school environmental group stated: "We will have to bring up examples from history and show kids that any great

change has happened because somebody had the backbone to stand up and say, 'I'm mad as hell and I'm not going to take it anymore'."

Social work as a profession has a historical obligation toward oppressed people. Such an obligation is based on the basic premises of the profession which proclaims advocacy of people's right to be respected and treated in a just manner. Although the social worker's role in defending the environment has not been delineated yet, it is necessary for the profession to take the lead. The general outline of social work's role could be in conducting empirical research to facilitate an understanding of the different dynamics associated with the problem. Because contamination of water resources is a technical disaster caused by a man and irresponsible practice of industry, a models of intervention should be developed in that context.

Generally, technical disasters impact the individual, the family and the community, and models of social work intervention must acknowledge the multiplicity of the impact on these levels. On the micro level, intervention might enhance individual's and families' abilities to assess and define the problem; help them to be aware of consequences; and provide them with adequate techniques to face the stressful events by defining their own resources. In the context of dealing with the stress generated by the disaster, social work intervention is crucial in providing these clients with support and educating the victims about practical means to identify and pursue sources of support. Disasters represents a challenges for change for individuals and families, and it is known that the process of change produces stress and anxiety. For example, a family that becomes involved in social activism might experience role strains that could affect family functioning unless family roles are redistributed to maintain an adequate level of family functioning.

On the macro level, social work intervention can assist the community in considering an effective means for change. These models might be

helpful in providing the community with training and education to develop new leadership in the community. Professional intervention might seek to train community members in negotiating, mediating, advocating, and lobbying with the different parties involved in the problem. Because a polluted community suffers from economic and social deterioration, professional intervention might lead to the development and the enhancement of resources within the community which could lead to economic growth. Finally, the profession of social work should incorporate adequate training for prospective practitioners to deal with this type of problem and population. Social work can no longer afford to wait for its role to be delineated by others; the profession should take the lead in devising innovative models for intervention.

This research project stresses the role of a family in responding to environmental hazards. Advocacy for the environment is no longer the role of professionals. Although largely unacknowledged by family studies scholars, protection from environmental hazards is a new role that the contemporary family is increasingly likely to have to play. It is not yet an institutionalized part of family functioning; however, news about natural and technical disasters that have taken place in the U.S. in the present time justify the study of family roles in protecting its well-being from these types of disasters.

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APPENDIX

Table1

Seriousness of the pollution of the Pigeon River

Degree	Activist Families	Non-Activist Families	Total Sample
Very Serious	21 (95.5)	22 (78.6)	43 (86)*
Serious	1 (4.5)	6 (21.4)	7 (14)
Not Serious	----	----	----

*(%)

Table 2

Family Concern

Concern	Frequency
Health Problem	11 (22.9)
Stable Work	8 (16.7)
Children Education	8 (16.7)
Life Satisfaction	8 (16.7)
Concern about the future	6 (12.5)
Free Time	3 (6.3)
Financial Problem	3 (6.3)
Time Management	1 (2.1)

Table 3

Perception of Government's Actions

	Effective			Moderate			Not Effective		
Government	Total	Active	Non Active	Total	Active	Non Active	Total	Active	Non Active
Previous Administration's Actions	---	---	---	3 (6)	1 (5)	2 (7)	41 (94)	21 (95)	26 (93)*
New Administration's Actions (Clinton/Gore)	7 (14)	4 (18)	3 (11)	19 (39)	11 (50)	8 (30)	23 (47)	7 (32)	16 (59)

*(%)

Table 4

Family Trust

	No Trust			Moderate Trust			Great Trust		
	Total	Active	Non Active	Total	Active	Non Active	Total	Active	Non Active
Environmental Action Groups	5 10	---	5 18.5	10 20.4	5 23	5 18.5	34 69.4	17 77	17 63*
Federal Government Agencies (EPA)	37 75.5	17 77	20 74	8 16	5 23	3 11	4 8	---	4 15*
Local Government (County Officials)	19 39	9 41	10 37	16 33	10 45	6 22	14 29	3 14	11 41*
State Politicians (Congressmen)	27 55	12 55	15 55.6	15 31	8 36	7 25.9	7 14	2 9	5 18.5*
Champion International	47 94	21 95.5	26 93	1 2	1 4.5	---	2 4	---	2 7*
Scientists & Technologists	9 18	7 32	2 8	19 39	9 41	10 31	21 43	6 27	15 56*

*(%)

Table 5

Demographic Information

Variables	Total Sample		Activist Families		Non-Activist Families	
Age						
Husband	45	(51.2)	18	(51.3)	25	(51.1)
Wife	45	(48.3)	18	(47.8)	27	(48.6)
Family Income	42	$2,726.90	19	$30,526.32	23	$24,565.22
Family with						
children	24	(48)	7	(32)	17	(61)
no children	26	(52)	15	(68)	11	(39)
Family Type						
>40 Yrs Age	11	(22)	4	(19)	7	(25)
40-60 Yrs Age	27	(55)	12	(57)	15	(54)
<60 Yrs Age	11	(22)	5	(21)	6	(21)
Yrs of Education						
Husband	45	(13.3)	19	(14.5)**	26	(12.4)
Wife	46	(13.3)	19	(14.4)**	27	(12.5)
Work						
Full Time	29	(58)	15	(68)	14	(50)
Part Time	4	(8)	2	(14)	1	(4)
Unemployed	7	(14)	---	---	7	(25)
Retired	10	(20)	4	(18)	6	(21)
Home						
Owned	47	(94)	22	(100)	25	(89)
Rent	3	(6)	---	---	3	(11)
Residency						
Born/Raised	31	(65)	10	(50)	21	(75)
Lived <20 Yrs.	13	(27)	9	(45)	4	(14)
Lived 10-20 Yrs.	4	(8)	1	(5)	3	(10)
Living Distant						
From River	49	4.2 Miles	22	6.9 Miles	27	1.9**Miles

* <0.1 **P<0.05 ***P<0.001

Table 6

Residents Political Affiliation

Party Affiliation	Total	Activist	Non-Activist
Democrat	5 (11.1)	3 (15)	2 (7.4)
Republican	24 (35.6)	7 (35)	15 (35)
Independent	16 (35.3)	10 (50)	10 (37)

Table 7

Community Views of Needed Research

Type of Research	Yes			No		
	Total	Activist	Non Activist	Total	Activist	Non Activist
Health Assessment	33 (66)	12 (54.5)	21 (75)	17 (34)	10 (45.5)	7 (25)*
Water Quality	31 (62)	14 (64)	17 (61)	19 (38)	8 (36)	11 (39)
Risk Analysis	27 (54)	10 (45.5)	17 (61)	23 (46)	12 (54.5)	11 (39)
Economic Assessment	25 (50)	12 (54.5)	13 (46)	25 (50)	10 (45.5)	15 (54)
Social/ Psychological Studies	12 (24)	10 (27)	17 (21)	23 (76)	12 (73)	11 (78)

*(%)

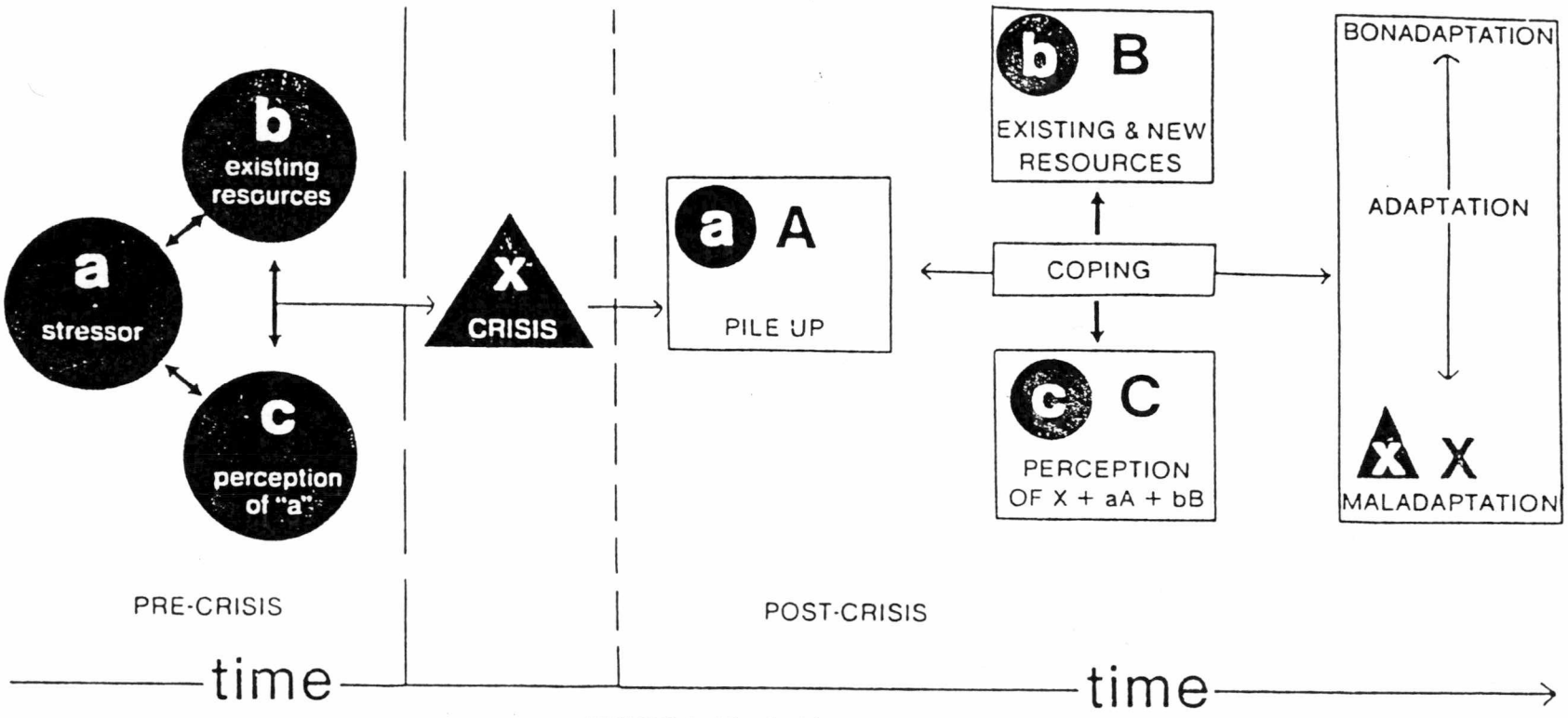
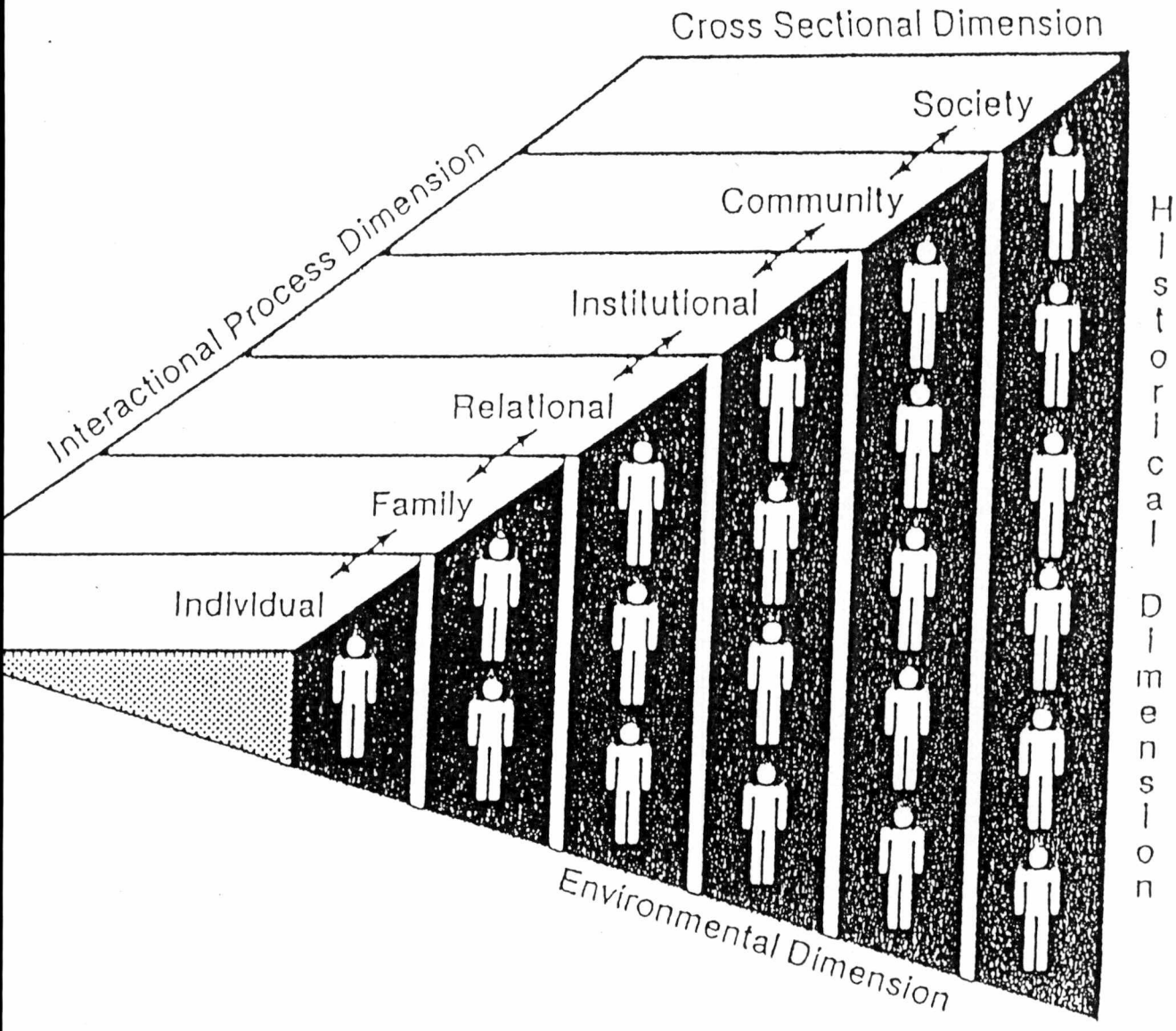


FIGURE 1. The double ABCX model

McCubbin & Patterson (1983)



The Social Process Model

Edelstein (1988)

Figure 2.

Figure 3

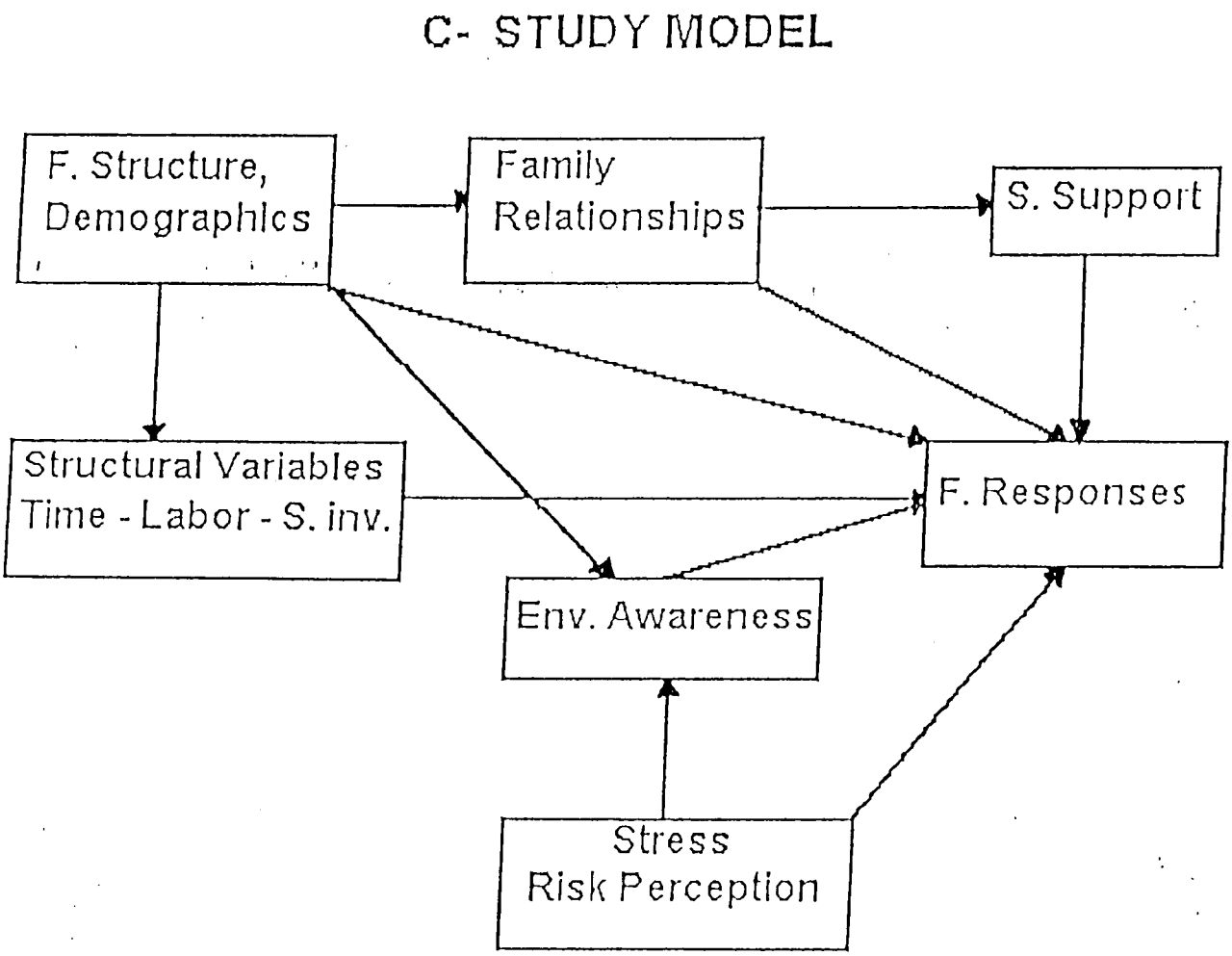

C- STUDY MODEL
F. Structure, Demographics
Family Relationships
S. Support
Structural Variables Time - Labor - S. inv.
F. Responses
Env. Awareness
Stress Risk Perception

Figure 4

(The Dependent Variable)

Family Responses

(Maladaption)	(Adaption)
Negative Responses	Positive Responses
* Denial	* Acknowledgement of the problem
* Apathy	* Expression of concern (Family - Community)
* Countermovement	* Attending public meetings
	* Signing petitions
	* Participation in legal actions
	* Participation in social protest
	* Joining SMO
	* Adopting leadership role in SMO

Figure 5

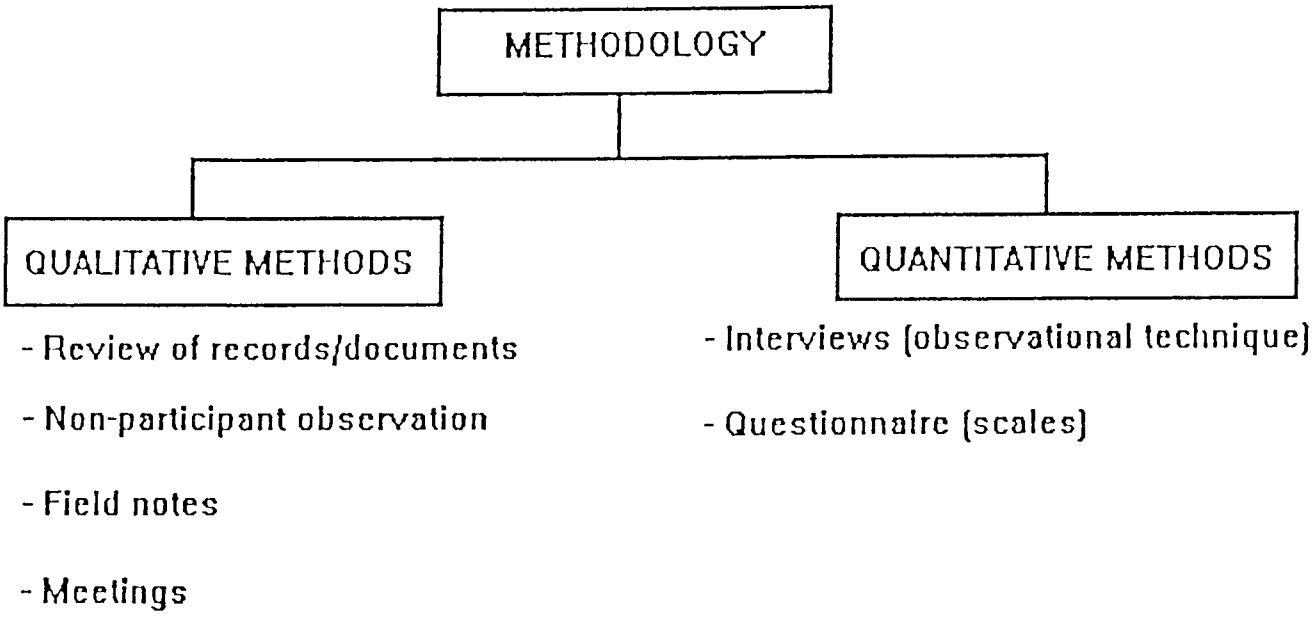

METHODOLOGY
QUALITATIVE METHODS
QUANTITATIVE METHODS
- Review of records/documents
- Non-participant observation
- Field notes
- Meetings
- Interviews (observational technique)
- Questionnaire (scales)

Figure 6

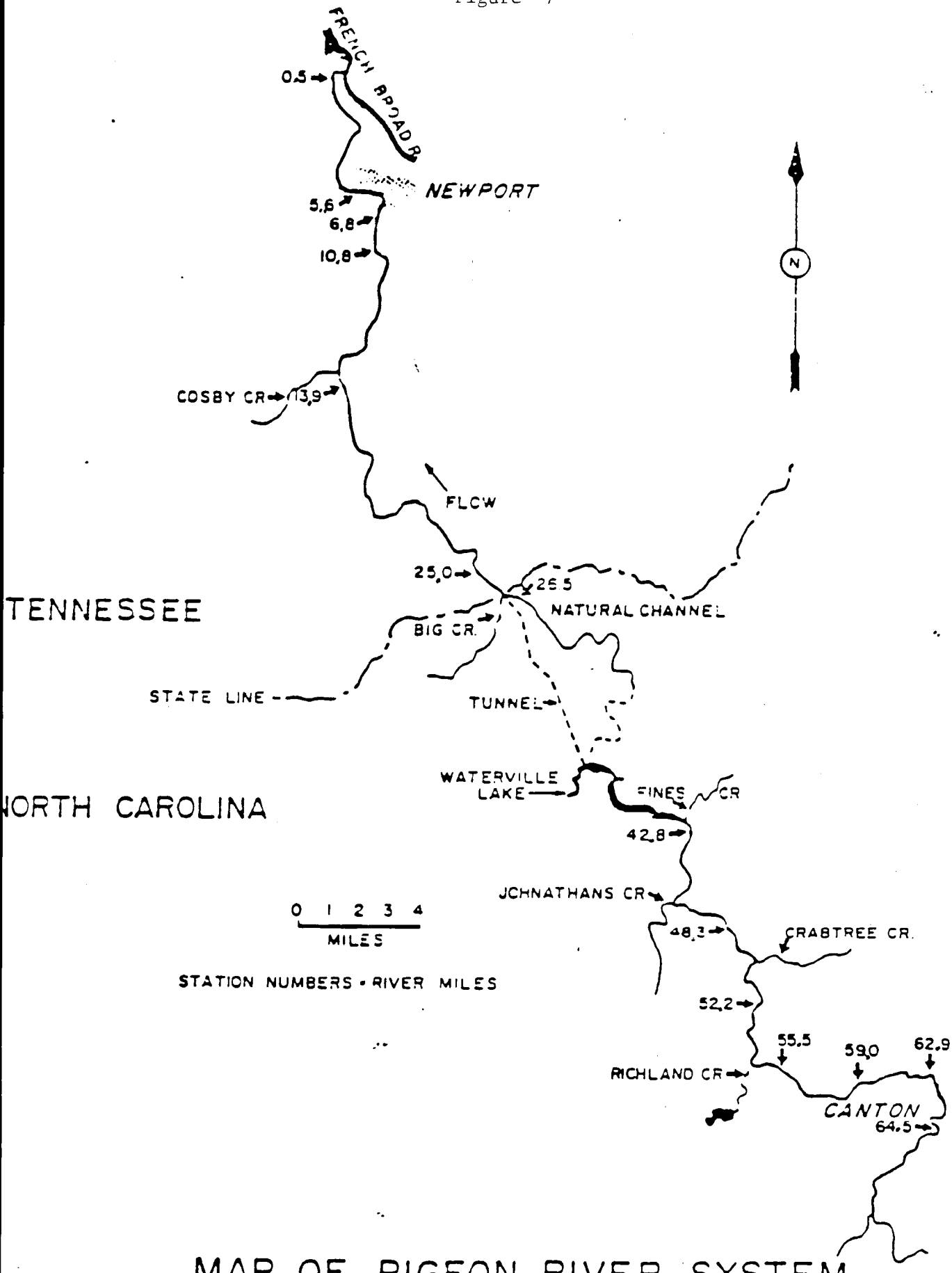
The Coding System

Observational method for the assessment of family stress

Topics for discussion	Parameters			
	Family agreement 1-5	Tone of voice 1-5	Anger 1-5	Frustration 1-5
a) Feelings toward the river as a symbol (FS)		**"I feel that the river is disable the same like me"		
b) Seriousness of the pollution (SP)			"The pollution is crippling our community"	
c) Fear of health consequences (FH)	"You are absolutely right. Children in this community are at risk of cancer"			"The EPA does not care much about our health"
d) Opinion regarding the source of pollution (Champ.) (OI)			"Champion is holding the entire community hostages"	
e) Concern about the future of the river and the family (CF)	"We are thinking about moving out if the river stays the same"			"I'm not optimistic that the river will be cleaned up. Ch. got the money"

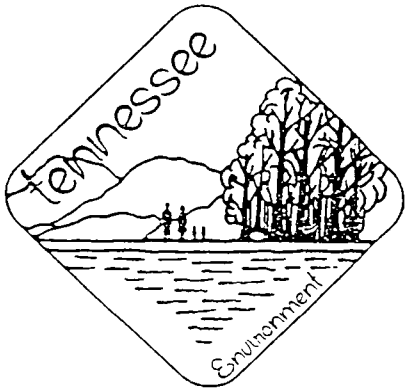
** These comments were taken from transcripts of actual family discussions.

Figure 7



MAP OF PIGEON RIVER SYSTEM SHOWING BIOLOGICAL SAMPLING STATIONS.

TENNESSEE FISHING ADVISORIES



MARCH 1992

TENNESSEE DEPARTMENT OF
ENVIRONMENT AND CONSERVATION

DIVISION OF WATER POLLUTION
CONTROL
150 NINTH AVENUE, NORTH
NASHVILLE, TN 37243-1534

(615) 741-6623

CURRENT FISH TISSUE ADVISORIES (February, 1992, This list subject to revision.)

STREAM	COUNTY	PORTION	POLLUTANT	TYPE ADVISORY
Loosahatchie River	Shelby	Mile 0.0-20.9	Chlordane	Fish should not be consumed.
Wolf River	Shelby	Mile 0.0-18.9	Chlordane	Fish should not be consumed.
Mississippi River	Shelby	MS line to mile 745	Chlordane	Fish should not be consumed. Commercial fishing ban.
McKellar Lake and Nonconnah Creek	Shelby	Mile 0.0 to 1.8, at Horn Lake Road bridge	Chlordane	Fish should not be consumed.
Boone Reservoir	Sullivan, Washington	Entirety	PCBs, chlordane	Precautionary advisory for carp and catfish.*
North Fork Holston River	Sullivan, Hawkins	Mile 0.0-6.2 TN/VA line	Mercury	Fish should not be consumed.
Woods Reservoir	Franklin	Entirety	PCBs	Catfish should not be consumed.
East Fork of Poplar Creek (incl. embayment)	Anderson, Roane	Mile 0.0 - 15.0	Mercury, metals, org. chemicals	Fish should not be consumed. Avoid contact with water.
Fort Loudoun Reservoir	Loudon, Knox, Blount	Entirety (46 miles)	PCBs	Commercial fishing for catfish prohibited. Catfish, largemouth bass over two pounds, and largemouth bass from the Little River embayment should not be consumed.
Tellico Lake	Loudon	Entirety	PCBs	Catfish should not be consumed.
Pigeon River	Cocke	N. Carolina line to Douglas Res.	Dioxin	Fish should not be consumed.
Watts Bar Reservoir	Roane, Meigs, Rhea, Loudon	Tennessee River portion	PCBs	Catfish, striped bass, and hybrid striped bass-whitebass should not be consumed. Precautionary advisory* for whitebass, sauger, carp, smallmouth buffalo and largemouth bass.
	Roane, Anderson	Clinch River arm	PCBs	Striped bass should not be consumed. Precautionary advisory for catfish and sauger*.
Melton Hill Reservoir	Knox, Anderson	Entirety	PCBs	Catfish should not be consumed.
Chattanooga Creek	Hamilton	Mouth to GA line	PCBs, chlordane	Fish should not be consumed. Avoid contact with water.
Nickajack Reservoir	Hamilton, Marion	Entirety	PCBs	Precautionary advisory for catfish*.

* Precautionary Advisory - Children, pregnant women, and nursing mothers should not consume the fish species named. All other persons should limit consumption of the named species to 1.2 pounds per month.

Figure 9

PAGE 2

LABOR FORCE ESTIMATES SUMMARY (continued)
January 1993 (preliminary) BM 91

NON-MSA COUNTIES	LABOR FORCE	EMPLOYMENT	UNEMPLOYMENT	JAN. RATE	DEC. RATE
Bedford County	14,290	13,240	1,050	7.3	6.1
Benton County	7,440	6,800	640	8.6	6.6
Bledsoe County	4,780	4,430	350	7.3	5.3
Bradley County	38,290	35,400	2,890	7.5	6.0
Campbell County	12,710	10,860	1,850	14.6	12.5
Cannon County	4,080	3,700	380	8.9	6.8
Carroll County	14,460	13,500	960	6.6	5.6
Chester County	5,180	4,840	340	6.6	5.5
Claiborne County	12,770	11,920	850	6.7	4.8
Clay County	5,530	5,180	350	6.3	4.0
Cocke County	15,080	12,020	3,060	20.3	14.9
Coffee County	19,680	18,190	1,490	7.6	5.8
Crockett County	7,570	6,810	760	10.0	8.0
Cumberland County	15,690	13,780	1,910	12.2	9.8
Decatur County	4,300	3,790	510	11.9	8.4
DeKalb County	8,190	7,540	650	7.9	7.3
Dyer County	17,680	16,010	1,670	9.4	7.0
Fayette County	10,740	9,440	1,300	12.1	8.4
Fentress County	7,000	6,230	770	11.0	9.3
Franklin County	17,600	16,370	1,230	7.0	5.8
Gibson County	21,990	20,130	1,860	8.5	7.0
Giles County	10,890	10,060	830	7.6	7.0
Greene County	27,410	23,680	3,730	13.6	10.8
Grundy County	4,800	4,020	780	16.3	12.1
Hamblen County	26,820	24,670	2,150	8.0	6.6
Hancock County	3,070	2,810	260	8.5	6.6

Figure 10

ANNUALIZED UNEMPLOYMENT RATES--NOT SEASONALLY ADJUSTED

	USA	TN	KNOX MSA	ANDER SON	BLOUNT	GRAIN GER	JEFFER SON
1980	7.1	7.3	6.9	6.2	7.1	9.5	9.3
1981	7.6	9.1	8.5	7.8	8.3	10.0	9.2
1982	9.7	11.8	10.2	10.2	10.4	13.1	12.1
1983	9.6	11.5	11.8	11.7	11.5	13.7	15.9
1984	7.5	8.0	8.8	7.8	9.0	13.4	11.0
1985	7.2	8.0	7.4	7.6	7.0	11.6	11.1
1986	7.0	8.0	7.8	7.2	8.9	12.4	11.8
1987	6.2	6.0	6.4	6.3	6.6	8.4	7.8
1988	5.5	5.8	5.4	4.7	5.7	7.0	6.7
1989	5.3	5.1	5.4	4.9	6.9	7.1	6.1
1990	5.5	5.2	4.9	4.5	5.2	6.4	6.8
1991	6.7	6.5	5.7	4.9	6.4	8.9	8.6
1992							
JAN	8.0	7.9	7.7	5.8	8.3	9.7	10.6
FEB	8.1	7.6	7.5	5.8	7.9	10.6	11.6
MAR	7.7	7.0	7.0	5.7	7.3	8.7	12.0
APR	7.1	6.3	6.1	5.4	6.0	8.4	10.3
MAY	7.2	6.8	6.0	6.1	5.8	8.3	9.0
JUN	7.8	7.2	6.2	6.7	6.4	7.8	8.8
JUL	7.6	6.5	5.6	5.7	6.5	6.8	7.1
AUG	7.3	6.2	5.6	5.8	6.1	5.7	5.9
SEP	7.2	5.9	5.1	5.2	6.4	5.7	5.6
OCT	6.8	4.9	4.2	4.2	5.2	4.3	4.8
NOV	7.0	5.2	4.8	4.1	5.5	5.2	6.1
DEC	7.0	5.7	5.6	4.6	6.2	5.8	7.4
1993							
JAN.	7.9	7.3	7.4	5.7	8.4	7.0	10.7

Lee Grant

LABOR MARKET INFORMATION UNIT
TENN. DEPT. OF EMPLOYMENT SECURITY
P.O. BOX 871

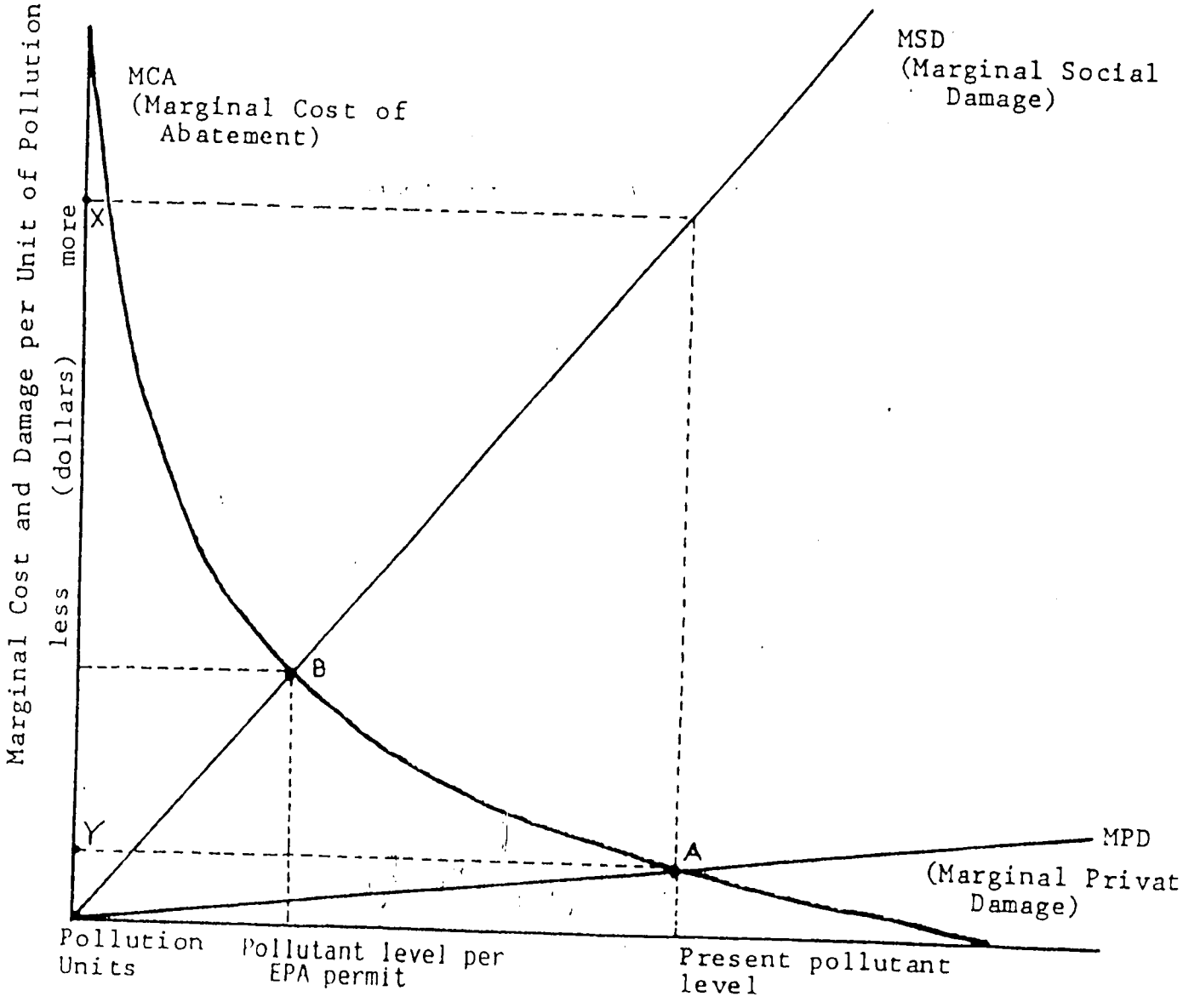
Figure 11

ANNUALIZED UNEMPLOYMENT RATES--NOT SEASONALLY ADJUSTED

	KNOX	SEVIER	UNION	CAMP BELL	CLAI BORNE	COCKE
1980	6.0	11.3	8.5	11.9	9.4	16.0
1981	7.7	14.4	11.2	14.3	12.6	19.4
1982	8.7	16.3	12.8	18.8	15.6	21.5
1983	10.4	17.6	13.5	21.4	15.4	23.8
1984	7.6	14.9	10.0	16.7	10.9	23.3
1985	5.7	14.6	9.1	15.2	10.0	21.7
1986	5.9	15.3	8.5	15.6	9.9	18.2
1987	5.3	11.8	8.7	14.2	8.2	14.3
1988	4.7	10.0	6.3	11.0	7.7	13.8
1989	4.4	9.4	6.0	9.9	6.4	12.3
1990	4.0	9.4	5.6	10.8	6.4	11.0
1991	4.6	10.3	7.4	17.7	7.9	13.7
1992						
JAN	5.1	22.7	7.6	19.8	8.1	19.0
FEB	4.9	21.2	6.9	21.1	7.3	18.6
MAR	4.8	18.9	4.6	16.9	6.2	17.4
APR	5.2	10.1	5.8	14.6	5.5	12.3
MAY	5.4	7.8	4.4	14.1	5.8	11.6
JUN	5.9	6.1	5.1	14.7	6.2	10.9
JUL	5.3	4.6	6.3	14.0	5.6	9.5
AUG	6.4	4.6	5.5	15.0	5.2	9.8
SEP	4.7	4.7	4.6	13.6	5.4	9.9
OCT	3.8	4.3	4.2	12.6	3.9	9.6
NOV	4.0	9.3	3.9	10.7	4.5	11.4
DEC	4.2	13.4	4.8	12.5	4.8	14.9
1993						
JAN.	5.0	20.0	5.7	14.6	6.7	20.3

Figure 12

Supply and Demand with Externalities-
The Case of Champion's Pollution of the Pigeon River



Bach & Barnett 1987

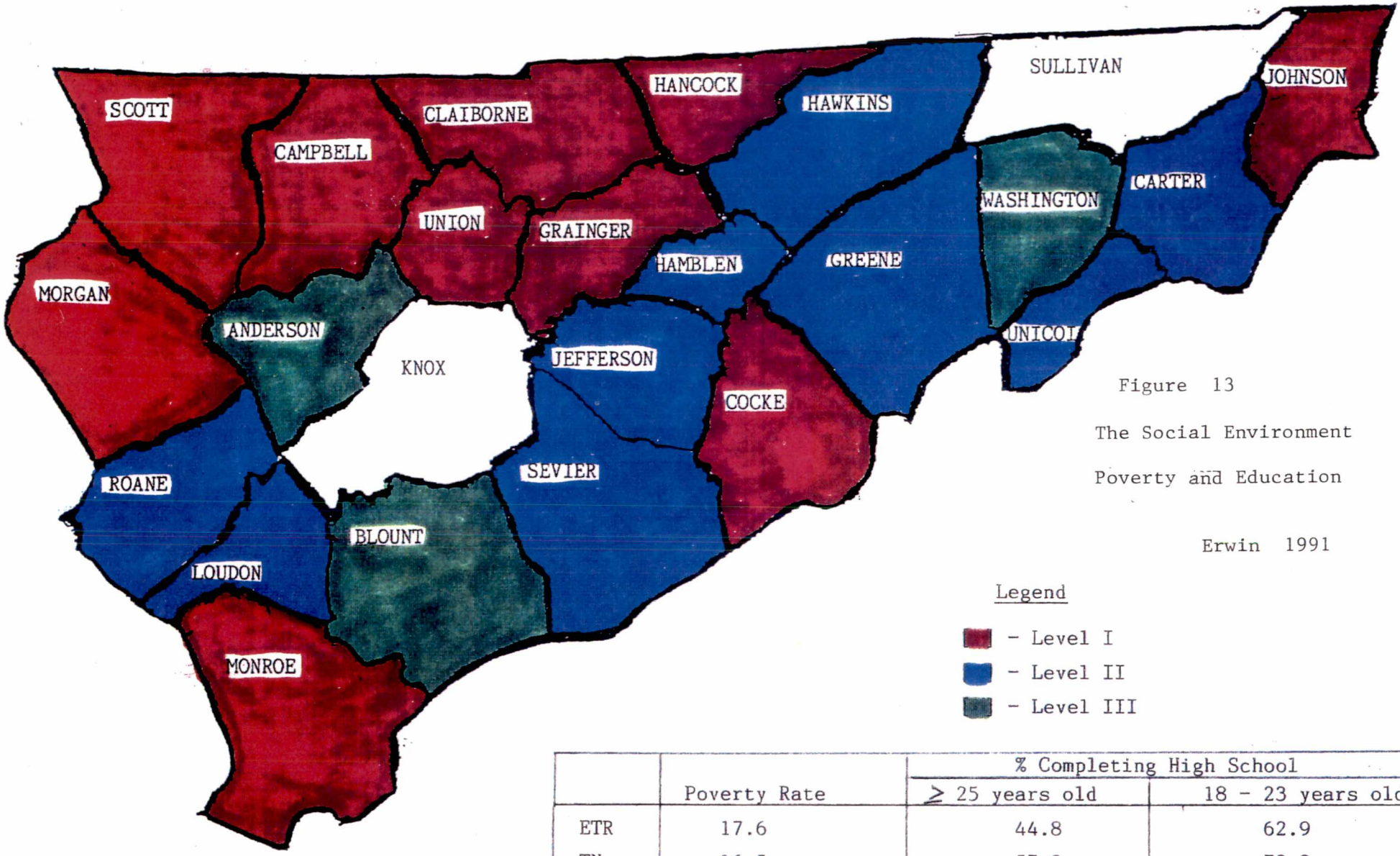


Figure 13

The Social Environment

Poverty and Education

Erwin 1991

Legend

- Level I
- Level II
- Level III

	Poverty Rate	% Completing High School	
		≥ 25 years old	18 - 23 years old
ETR	17.6	44.8	62.9
TN	16.5	57.9	72.3
US	12.4	~60	~ 75

*Poverty - based on estimates of % living below poverty, 1989

Education - based on % graduating High School, 1980

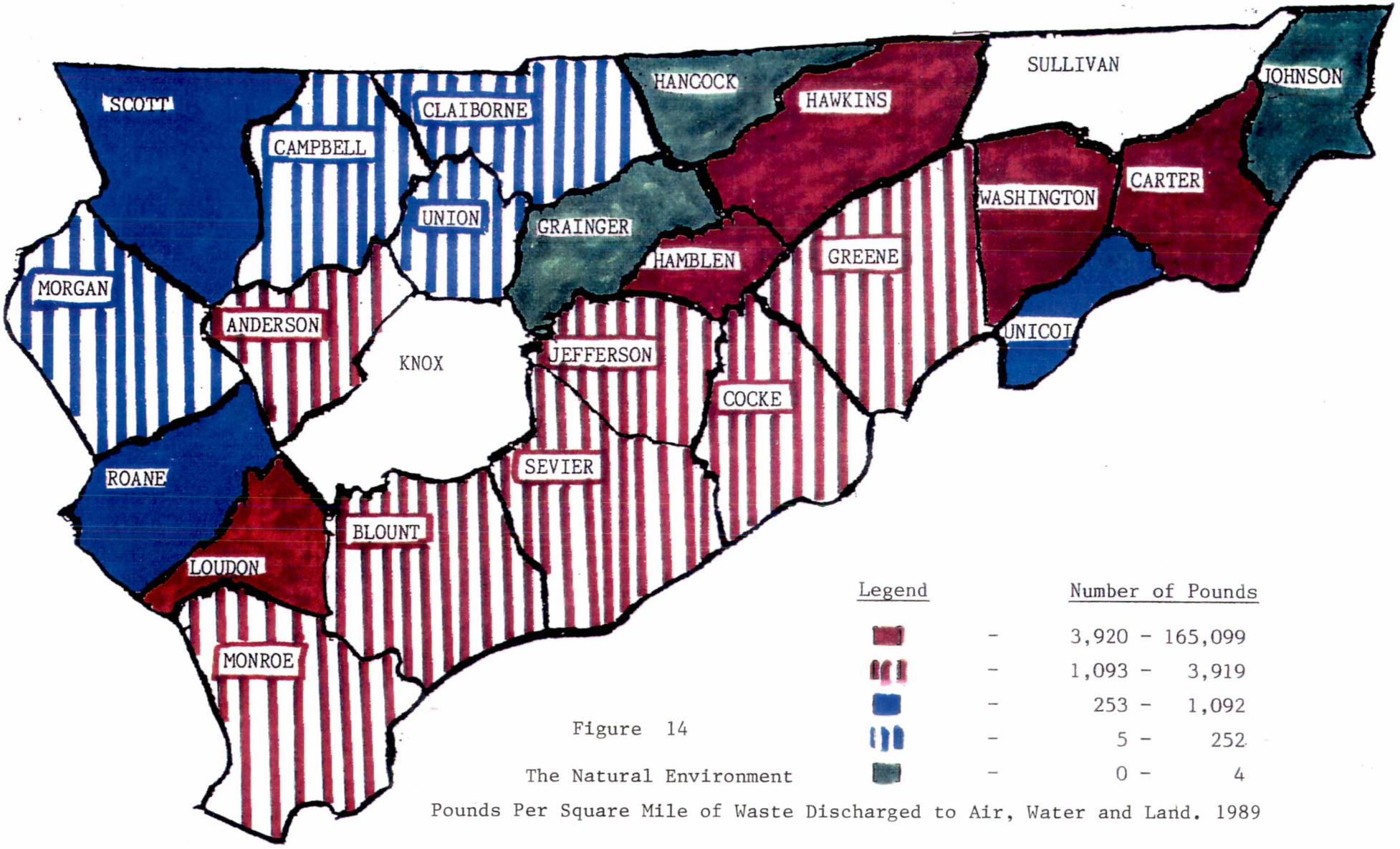


Figure 14

The Natural Environment

Pounds Per Square Mile of Waste Discharged to Air, Water and Land. 1989

Erwin 1991

tal for Tennessee: 6774 lbs./sq. mi.

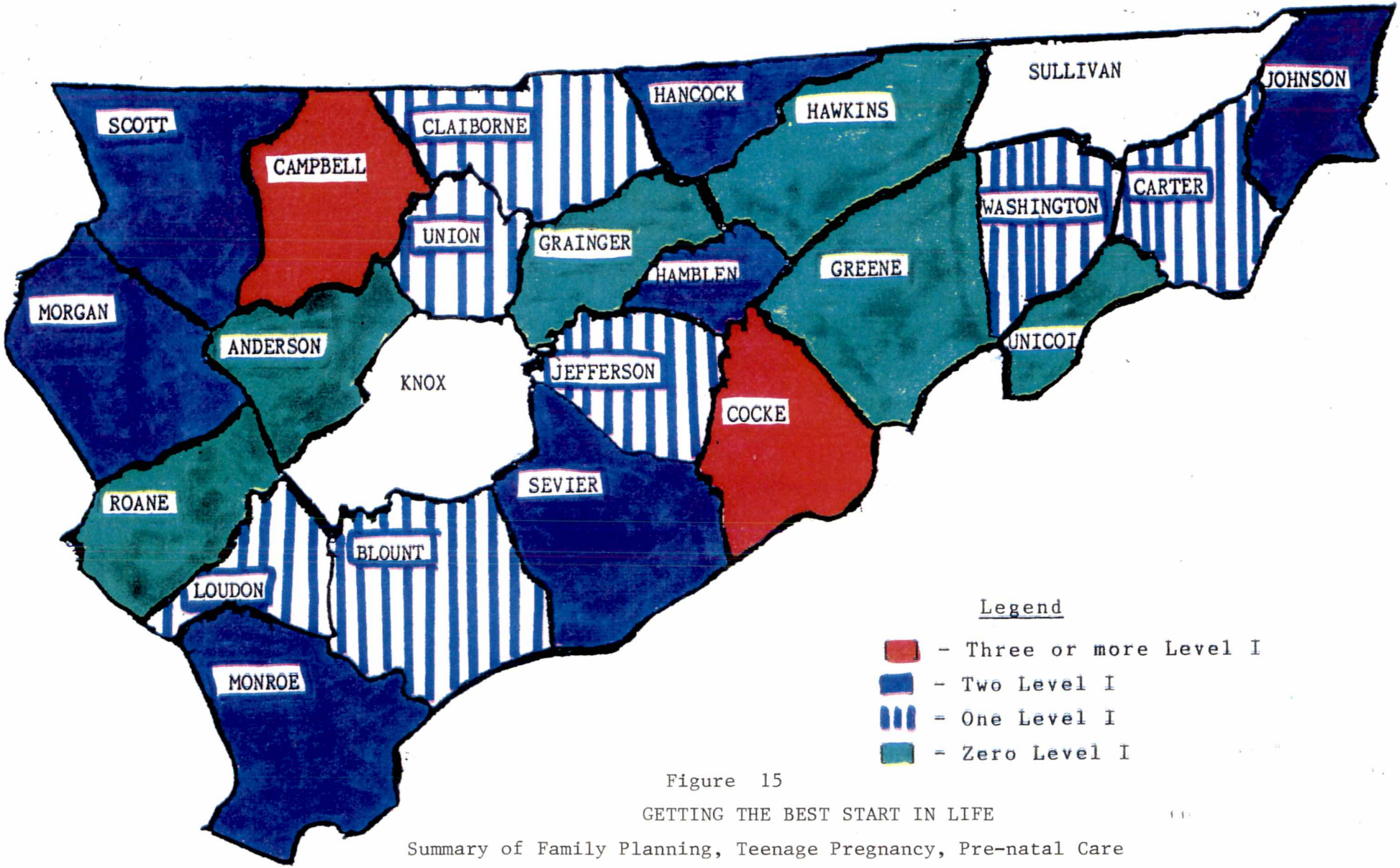


Figure 15

GETTING THE BEST START IN LIFE

Summary of Family Planning, Teenage Pregnancy, Pre-natal Care

Low Birth Weight, and Infant Mortality By number of Level I Indicators

Erwin 1991

Data from 1987-1989

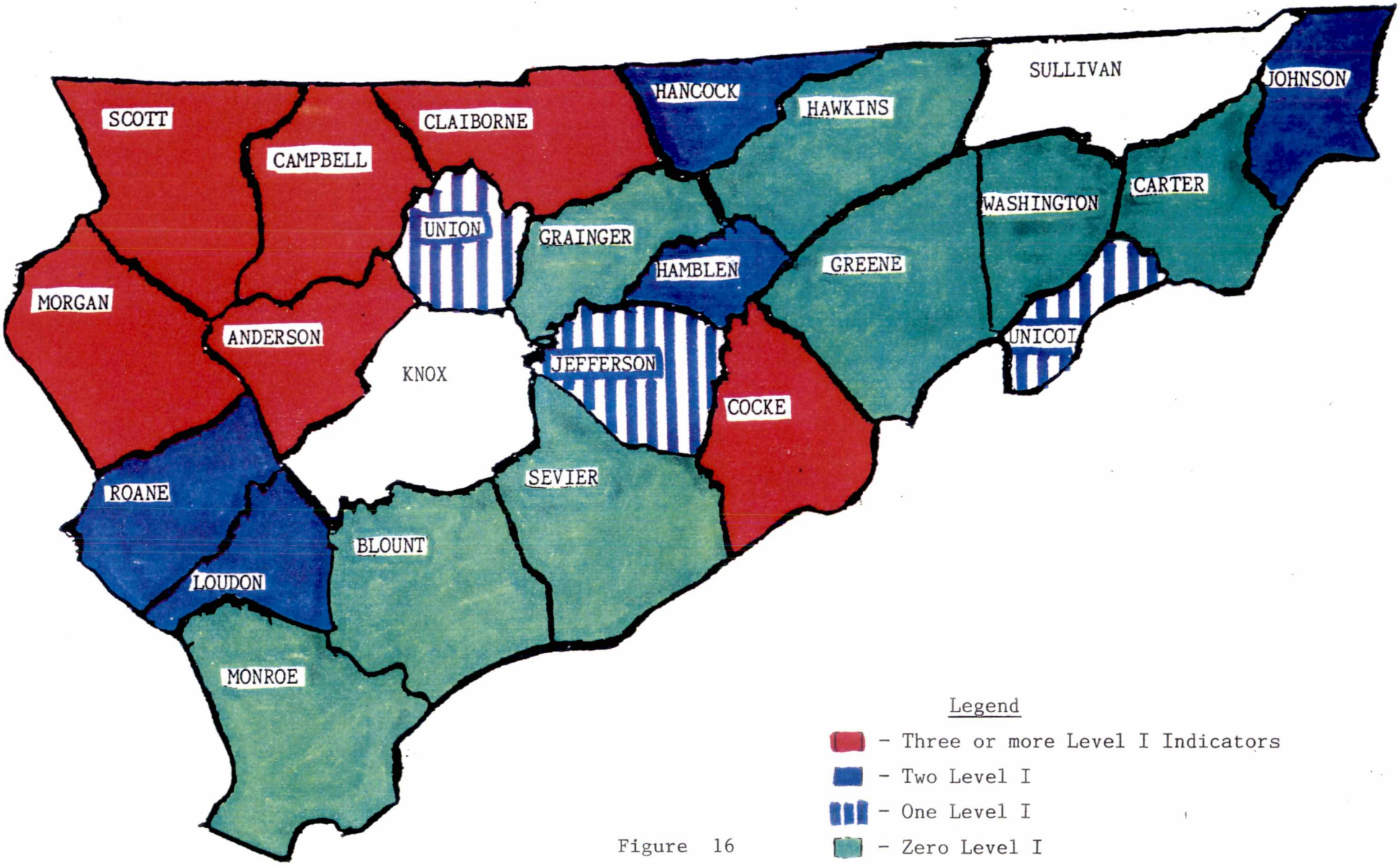


Figure 16

BUILDING ON THE BEST START IN LIFE

Summary of WIC, Breastfeeding Rates, Immunization Levels, Oral Health, and CUFCAT

Erwin 1991

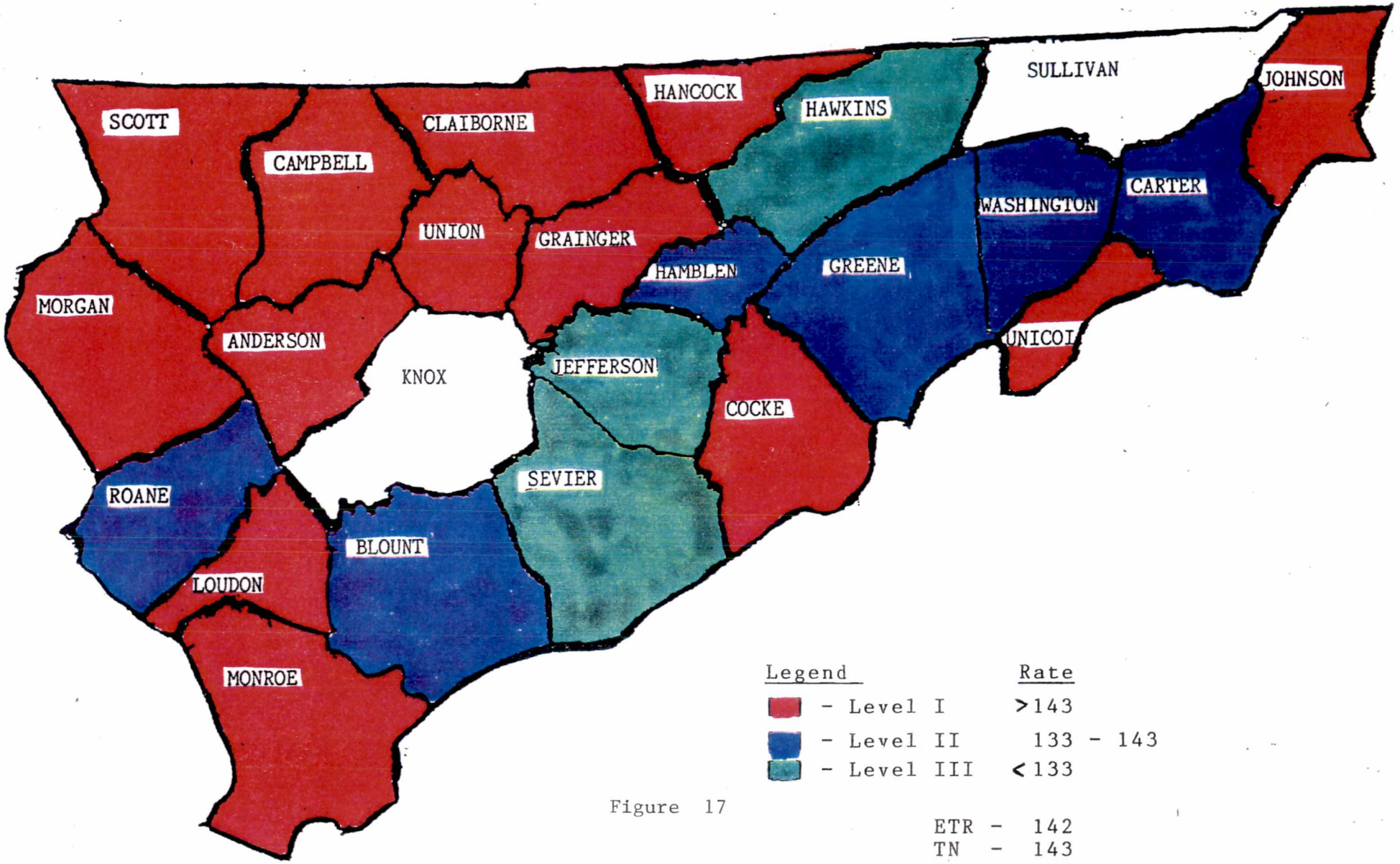


Figure 17

CANCER MORTALITY

1986-1988, age adjusted rates;
deaths per 100,000 population

ETR - 142
TN - 143
US - 133
Y2000 - 130

Erwin 1991

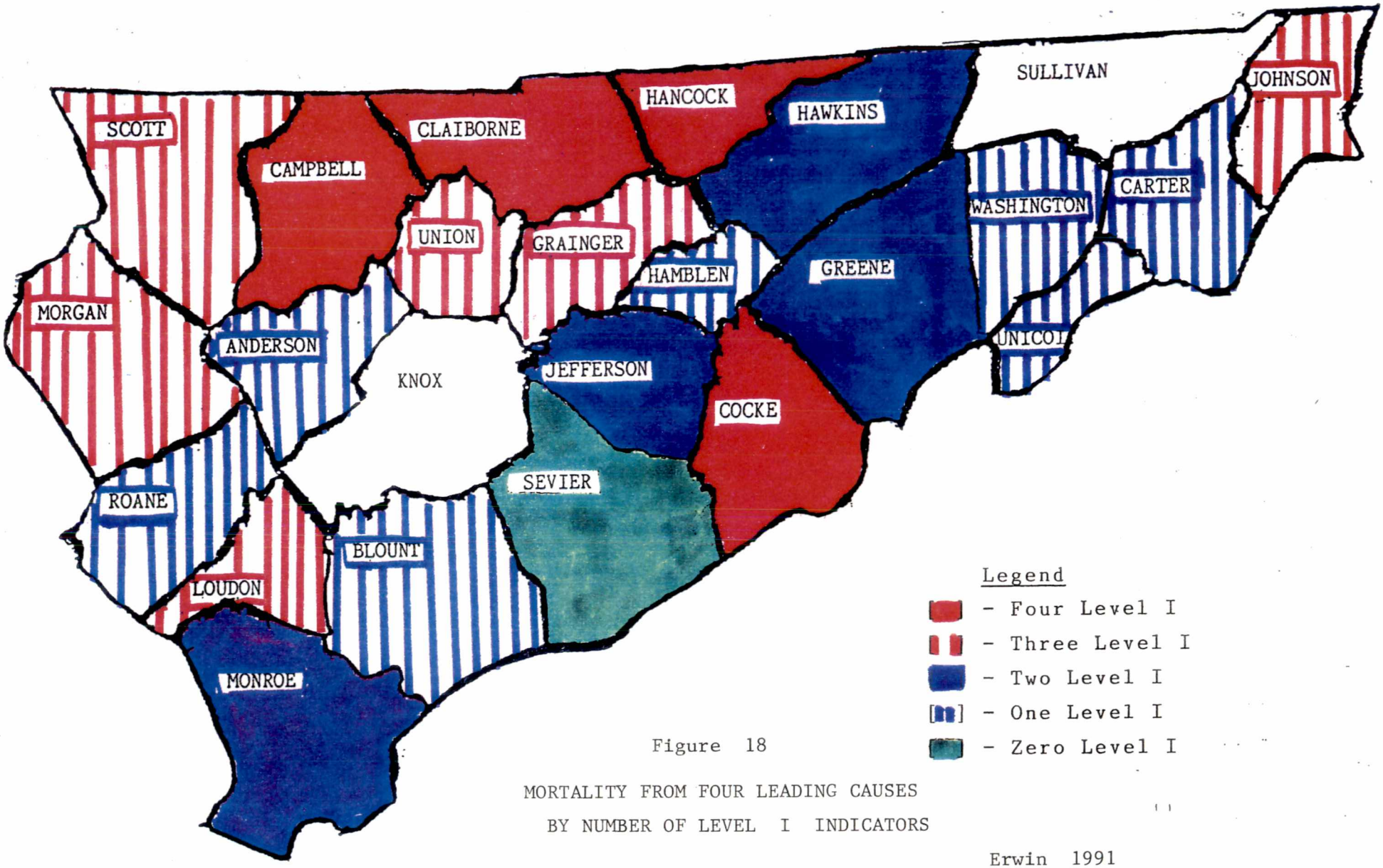


Figure 18

MORTALITY FROM FOUR LEADING CAUSES
BY NUMBER OF LEVEL I INDICATORS

Erwin 1991

STATISTICS

Extended Labels for Study Variables

FRELA	Family Relationships
SENSCON	Sense of Community
ENVAWAR	Environmental Awareness
RISK	Risk Perception
SUPPORT	Social Support
STRESS	Stress
STRESSOB	Stress Observation
CINVOLV	Community Involvement
INCOME	Family Income
EDUCH	Level of Education
AGEH	Husband's Age
AGEW	Wife's Age
DISTAN	Distant From the River
RESPONS	Family Response

The SAS System

15:51 Monday, July 12, 1993

Correlation Analysis

4 'VAR' Variables: FRELAT SENSCOM ENVAMAR RISK SUPPORT
STRESS STRESCO ENVOLV INCOME EDUCH
AGEH AGEW HUSCED MIFED DISTAN
RESPONS

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
FRELAT	48	33.6875	4.0013	1617.0	21.0000	40.0000
SENSCOM	50	31.4000	7.0134	1570.0	12.0000	40.0000
ENVAMAR	50	42.8000	4.7703	2144.0	32.0000	50.0000
RISK	50	26.2600	3.0136	1313.0	18.0000	30.0000
SUPPORT	50	74.9000	10.0250	3746.0	50.0000	100.0
STRESS	20	5.5950	0.5025	107.4	5.0000	7.0000
STRESCO	20	87.7143	11.5424	2456.0	61.0000	100.0
ENVOLV	50	18.0000	9.0100	900.0	0	35.0000
INCOME	42	27261.9	17943.9	1145000	5000.0	70000.0
EDUCH	49	13.0939	2.7303	671.0	8.0000	17.0000
AGEH	43	51.1860	12.9960	2201.0	30.0000	82.0000
AGEW	45	48.3333	12.7367	2175.0	30.0000	78.0000
HUSCED	45	13.2667	3.2919	597.0	2.0000	17.0000
MIFED	46	13.3043	2.6987	612.0	3.0000	17.0000
DISTAN	49	4.1857	6.9831	205.1	0.1000	30.0000
RESPONS	50	62.0000	28.2843	3100.0	0	100.0

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0
/ Number of Observations

	FRELAT	SENSCOM	INVANAR	RISK	SUPPORT	STRESS
FRELAT	1.00000 0.0 43	0.41322 0.0035 43	-0.20326 0.1355 43	-0.04179 0.7779 43	0.03943 0.7902 43	-0.04558 0.8214 27
SENSCOM	0.41322 0.0035 43	1.00000 0.0 50	-0.21393 0.1353 50	0.08172 0.5769 50	0.01525 0.9163 50	-0.06721 0.7340 28
INVANAR	-0.20326 0.1355 43	-0.21393 0.1353 50	1.00000 0.0 50	0.35294 0.0119 50	-0.08133 0.5745 50	0.35736 0.0619 28
RISK	-0.04179 0.7779 43	0.08172 0.5769 50	0.35294 0.0119 50	1.00000 0.0 50	0.31015 0.0234 50	-0.06825 0.7300 28
SUPPORT	0.03943 0.7902 43	0.01525 0.9163 50	-0.08133 0.5745 50	0.31015 0.0234 50	1.00000 0.0 50	0.03265 0.8690 28
STRESS	-0.04558 0.8214 27	-0.06721 0.7340 28	0.35736 0.0619 28	-0.06825 0.7300 28	0.03265 0.8690 28	1.00000 0.0 28
STRESSC	-0.15797 0.4294 27	-0.08521 0.6664 28	0.22138 0.2571 28	-0.06355 0.7480 28	0.01975 0.9283 28	0.15799 0.4403 26
INVOLV	0.10733 0.4873 43	0.10161 0.1325 50	0.23933 0.0933 50	0.05765 0.6910 50	0.16743 0.2453 50	-0.06669 0.7260 28
INCOME	-0.02736 0.8652 41	0.14402 0.3629 42	-0.05157 0.7457 42	-0.02306 0.8860 42	0.18797 0.2332 42	-0.04413 0.8373 24
LOCH	-0.08267 0.6530 43	-0.03513 0.8104 49	-0.06577 0.6533 49	-0.20483 0.1385 49	0.06777 0.6436 49	-0.30482 0.1147 28
AGEH	0.04532 0.7732 42	0.04619 0.7607 43	0.22523 0.1446 43	0.07595 0.6233 43	0.14070 0.3692 43	0.20052 0.1715 24
AGEW	0.05973 0.6967 43	0.09011 0.5561 43	0.20551 0.1758 43	-0.03703 0.8134 43	-0.10669 0.4959 43	0.28238 0.1805 24

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	FRELAT	JENSCOM	ENVAJAR	RISK	SUPPORT	STRESS
USED	0.14794 0.3433 43	-0.25623 0.0393 45	-0.01312 0.9313 45	-0.10970 0.4732 45	0.11956 0.4341 45	-0.34500 0.0243 26
IFED	0.02160 0.8380 45	-0.15059 0.3181 46	0.11016 0.4661 46	-0.21090 0.1594 46	0.01190 0.9375 46	-0.21045 0.3126 25
ISTAN	-0.14573 0.3224 47	-0.29035 0.0430 49	0.20975 0.1480 49	0.07113 0.6272 49	-0.00477 0.9741 49	0.28903 0.1437 27
ISPNS	-0.13700 0.3912 43	-0.01027 0.9271 50	0.37049 0.0067 50	0.27095 0.0469 50	0.23464 0.1010 50	0.08246 0.6766 28

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0
/ Number of Observations

	STRESS	INVOLV	INCOME	EDUCH	AGEH	AGEW
RELAT	-0.15997 0.4234 27	0.10733 0.4873 43	-0.02736 0.8652 41	-0.06967 0.6330 43	0.04582 0.7732 42	0.05973 0.6967 45
ENSCOM	-0.08521 0.6684 28	0.19161 0.1825 50	0.14402 0.3629 42	-0.03513 0.8104 49	0.04619 0.7687 43	0.09011 0.5561 45
NVANAR	0.22153 0.2571 23	0.23953 0.0938 50	-0.05157 0.7457 42	-0.06577 0.6535 49	0.22623 0.1446 43	0.20551 0.1756 45
ISK	-0.06358 0.7480 28	0.05763 0.6910 50	-0.02806 0.8600 42	-0.20460 0.1585 49	0.07595 0.6283 43	-0.00703 0.9634 45
UPPORT	0.01975 0.9205 28	0.16743 0.2450 50	0.13797 0.2832 42	0.06777 0.6436 49	0.14070 0.3632 43	-0.10659 0.4859 45
IRESS	0.15709 0.4403 26	-0.06660 0.7560 28	-0.04413 0.8378 24	-0.20432 0.1147 28	0.28352 0.1715 24	0.28238 0.1805 24
IRESS	1.00000 0.0 28	0.21304 0.2650 28	0.21765 0.3069 24	0.29475 0.1279 28	0.04922 0.8235 24	0.10082 0.6393 24
INVOLV	0.21304 0.2650 28	1.00000 0.0 50	0.36400 0.0120 42	0.36272 0.0104 49	-0.12916 0.4091 43	-0.13587 0.3735 45
NCOME	0.21765 0.3069 24	0.36400 0.0120 42	1.00000 0.0 42	0.53591 0.0003 42	-0.01120 0.9475 37	0.11360 0.4971 38
DUCH	0.29475 0.1279 28	0.36272 0.0104 49	0.53591 0.0003 42	1.00000 0.0 49	-0.31570 0.0392 43	-0.15367 0.3135 45
GEH	0.04922 0.8235 24	-0.12916 0.4091 43	-0.01120 0.9475 37	-0.31570 0.0392 43	1.00000 0.0 43	0.95355 0.0001 40
GEW	0.10082 0.6393 24	-0.13587 0.3735 45	0.11360 0.4971 38	-0.15367 0.3135 45	0.95355 0.0001 40	1.00000 0.0 45

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	STRESS3	INVOLV	INCOME	TOUCH	AGEH	AGEW
[illegible]	0.09559 0.6423 26	0.14246 0.3505 45	0.04302 0.7943 39	0.37361 0.0125 44	-0.04755 0.7708 40	-0.16660 0.3042 40
IFED	0.46684 0.0217 25	0.33857 0.0214 46	0.23735 0.1504 38	0.52194 0.0001 45	-0.02580 0.8745 40	-0.01016 0.9478 44
ISTAN	0.06109 0.7621 27	0.04211 0.7739 49	0.21469 0.1777 41	0.13203 0.2155 43	0.09305 0.5573 42	0.06392 0.6002 44
ISPEN3	0.42334 0.0223 28	0.52596 0.0001 50	0.23495 0.1342 42	0.26455 0.0862 47	0.05211 0.7400 43	0.01307 0.9321 45

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	HUSBED	WIFED	DISTAN	RESPONS
RELAT	0.14794 0.3433 43	0.02160 0.8880 45	-0.14573 0.3234 47	-0.13780 0.2012 48
EDUCA1	-0.25628 0.0393 45	-0.15050 0.3131 46	-0.29035 0.0430 49	-0.01327 0.9271 50
NVAWAR	-0.01312 0.9313 45	0.11016 0.4661 46	0.20975 0.1480 49	0.37040 0.0067 50
ISK	-0.10270 0.4732 45	-0.21690 0.1594 46	0.07113 0.6272 49	0.27995 0.0409 50
UPPORT	0.11956 0.4341 45	0.01190 0.9375 46	-0.00477 0.9741 49	0.23464 0.1010 50
TRESS	-0.34500 0.0843 25	-0.21045 0.3125 25	0.20903 0.1457 27	0.08246 0.6766 28
TRESS	0.09559 0.6423 25	0.45634 0.0217 25	0.06100 0.7521 27	0.42384 0.0223 28
INVOLV	0.14245 0.3503 45	0.33057 0.0214 46	0.04211 0.7739 49	0.52596 0.0001 50
NCOME	0.04302 0.7943 39	0.23785 0.1504 38	0.21469 0.1777 41	0.20495 0.1942 42
OUCH	0.37061 0.0125 44	0.02194 0.8881 45	0.10200 0.2155 48	0.26455 0.0662 49	
OCH	-0.04755 0.7703 40	-0.02300 0.8745 40	0.09805 0.5573 42	0.05211 0.7400 43
OCH	-0.15060 0.3042 40	-0.01316 0.9473 44	0.06392 0.6502 44	0.01307 0.9321 45

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0
/ Number of Observations

	HUSBED	WIFED	DISTAN	RESPONS
HUSBED	1.00000 0.0 45	0.33143 0.0127 42	0.27011 0.0762 44	0.10419 0.2012 45
WIFED	0.33143 0.0127 42	1.00000 0.0 45	0.36510 0.0142 45	0.24959 0.0944 45
DISTAN	0.27011 0.0762 44	0.36510 0.0142 45	1.00000 0.0 49	0.23560 0.0467 49
RESPONS	0.10419 0.2012 45	0.24959 0.0944 45	0.23560 0.0467 49	1.00000 0.0 50

1. Occupation

Husband _____ Wife _____

2. Place of employment

Husband _____ Wife _____

3. How many miles do you travel to work each day? (to + from)

4. How long have you lived in Cocke County?

( ) born and raised in Cocke county.
( ) more than 20 years.
( ) 10-20 years.
( ) less than 10 years.

5. How close do you live to the Pigeon River?

_____ _____ miles

6. I rent my house ( ) I own my house ( )

7. Do you think the Pigeon River is polluted?

( ) Yes ( ) No ( ) Don't know

If Yes

8. How serious is the pollution of the Pigeon River?

( ) Very serious ( ) Serious ( ) Not serious

Please read each statement and circle the number that most closely reflects your agreement with the statement.

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
9.	We are a strong family.	5	4	3	2	1
10.	The family has always been very important for us.	5	4	3	2	1
11.	We often praise and compliment each other.	5	4	3	2	1
12.	We feel responsible for protecting our family.	5	4	3	2	1
13.	We do many things together.	5	4	3	2	1
14.	We encourage each other to develop in his or her individual way.	5	4	3	2	1
15.	Our family is well thought of in the community.	5	4	3	2	1
16.	Usually each of us goes his/her own separate way.	5	4	3	2	1

The following questions address family response to the Pigeon River problem. Please respond to these questions by checking one of the answers below.

17. How often do you (as a family) discuss the problem of the Pigeon River?

Very often ( ) Often ( ) Occasionally ( ) Sometime ( ) Rarely ( )

18. Do family members agree on issues related to the river problem?

Very often ( ) Often ( ) Occasionally ( ) Sometime ( ) Rarely ( )

19. How do you reach a family decision most often?

( ) Through discussion
( ) We don't care much about reaching a decision
( ) Every person keeps his/her own opinion

The following questions deal with your feelings toward your community. Please read every question and circle the answer that reflects your response.

20. To what extent do you feel "at home" in this community?

Not at all at home 0 1 2 3 4 5 Very at home

21. To what extent to you feel that you are an important part of this community?

Not important 0 1 2 3 4 5 Very important

22. How much do you agree with the values and beliefs of your neighbors?

Don't at all agree 0 1 2 3 4 5 Very much agree

23. How interested are you in knowing what goes on in this community?

Not at all interested 0 1 2 3 4 5 Very interested

24. Suppose that for some reason you had to move away from here. How sorry would you be to leave?

Not at all sorry 0 1 2 3 4 5 Very sorry

For each of the following statements, please circle the number that reflects your agreement or disagreement.

	Strongly Agree				Strongly Disagree
25. This is a good place to raise children.	5	4	3	2	1
26. This community has just about everything that is needed for a happy life.	5	4	3	2	1
27. People who live around here are quite helpful.	5	4	3	2	1

		Strongly Agree				Strongly Disagree
28.	People around here have a hard time accepting the pollution of the river.	5	4	3	2	1
29.	If members of this community get together, they can solve the problem of the river.	5	4	3	2	1
30.	This community is politically weak because people won't fight for their own interest.	5	4	3	2	1
31.	Communities like this one have little chance of protecting their interests when they conflict with more powerful business interests.	5	4	3	2	1
32.	The federal government must introduce harsh measures to halt pollution.	5	4	3	2	1
33.	I would be willing to make a personal effort for the sake of slowing down the pollution.	5	4	3	2	1
34.	Classes focusing on the conservation of natural resources and pollution prevention should be taught in the public schools.	5	4	3	2	1
35.	Although there is continual contamination of our lakes, streams, and air, nature's purifying processes soon return them to normal.	5	4	3	2	1
36.	Because the government has such good inspection and control agencies, it is very unlikely that pollution will become excessive.	5	4	3	2	1
37.	Industry is trying its best to develop effective anti-pollution technology.	5	4	3	2	1

	Strongly Agree				Strongly Disagree
38. The currently active anti-pollution organizations are really more interested in disrupting society, than they are in fighting pollution.	5	4	3	2	1
39. If an industry cannot control its pollution, it should be shut down.	5	4	3	2	1
40. Pollution control measures have placed unfair burdens on industry.	5	4	3	2	1
41. Managers of polluting industries should be punished by fines and imprisonment.	5	4	3	2	1

Read the following statements, and write down a short statement that best reflect your opinion.

42. The problem of the Pigeon River will be resolved when

_____

_____

_____

43. I think I should fight the pollution of the Pigeon River because

_____

_____

_____

44. As a family, our main concern about the river is

_____

_____

_____

Read each statement and circle the number that most closely reflects your agreement with the statement.

45. Champion International is serious about cleaning up the river.

Agree 1 2 3 4 5 6 7 Disagree

46. The pollution of the Pigeon River is only a local problem.

Agree 1 2 3 4 5 6 7 Disagree

47. Do you think that the federal government's actions in dealing with the problem of the Pigeon River have been adequate?

Adequate 1 2 3 4 5 6 7 Inadequate

48. I think that the new administration of Clinton and Gore will be more effective in resolving the pollution of the Pigeon River.

Agree 1 2 3 4 5 6 7 Disagree

Indicate the level of trust you have in each of the following groups to solve the pollution problem of the Pigeon River?

	No Trust				Great Trust
49. Environmental action groups, (eg. DPRC, ACE, Greenpeace.)	1	2	3	4	5
50. Federal government agencies (eg. EPA.)	1	2	3	4	5
51. Local government (eg. county officials, local politicians.)	1	2	3	4	5
52. Politicians (eg. congressmen.)	1	2	3	4	5
53. Champion International.	1	2	3	4	5
54. Scientists and technologists.	1	2	3	4	5

Please read each statement and check the response that most closely reflects your agreement with the statement.

55. I believe that the pollution of the Pigeon River represents a health problem to my family.

Strongly Agree -- Agree -- Fair -- Disagree -- Strongly Disagree --

56. I'm worried about the children in this community, that some of them may develop health problems in the future.

Strongly Agree -- Agree -- Fair -- Disagree -- Strongly Disagree --

57. Even though there is not enough evidence to prove that dioxin in the river is at a risky level, I'm still concerned about my family.

Strongly Agree -- Agree -- Fair -- Disagree -- Strongly Disagree --

58. After the completion of the modernization program by Champion, I will feel safe that pollution is not a problem anymore.

Strongly agree -- Agree -- Fair -- Disagree -- Strongly Disagree --

59. If the EPA or the Health Department announces that there is no risk from dioxin, I will be willing to eat fish from the Pigeon River.

Strongly Agree -- Agree -- Fair -- Disagree -- Strongly Disagree --

60. I believe Champion officials who say that the problem of the river is only a color problem.

Strongly Agree -- Agree -- Fair -- Disagree -- Strongly Disagree --

61. I feel that people will lose jobs if the pollution problems is addressed.

Strongly Agree -- Agree -- Fair -- Disagree -- Strongly Disagree --

62. Gossip, rumors and hearsay have created a fear of dioxin in the river.

Strongly Agree -- Agree -- Fair -- Disagree -- Strongly Disagree --

63. I obtain information about the problem of the Pigeon River from: (Check the two that most depend on)

( ) Newspaper, magazines
( ) Television/radio
( ) Discussion with people at work
( ) Others (Specify) _____
( ) Books, scientific journals
( ) Lectures, meetings
( ) Discussion with family/friends

64. What is your opinion about the media coverage of the problem of the Pigeon River?

_____

_____

_____

_____

65. Do you believe that more research should be done on the Pigeon River?

Yes ( ) No ( )

If yes, go to question # 66. If no, go to question # 67.

66. please indicate what type of research you believe should be done.

( ) Health assessment
( ) Economic assessment
( ) Other (specify) _____
( ) Water quality
( ) Social/Psychological studies
( ) Risk analysis

67. How important do you think it is to do more health assessment research in the Pigeon River community?

Not at all important 1 2 3 4 5 Extremely important

Please, go to the next page.....

Please read the following statements and circle the number that best reflects how you feel.

68. If you became active in the problem of the Pigeon River, how important for you would it be to receive support from the following groups?

	Very important				Not very important
a) Family	5	4	3	2	1
b) Neighbors	5	4	3	2	1
c) Friends	5	4	3	2	1
d) Community	5	4	3	2	1
e) Local government	5	4	3	2	1

69. To become active on behalf of the Pigeon River, how important would be your ability to obtain the following?

	Very important				Not very important
a) Funding	5	4	3	2	1
b) Information	5	4	3	2	1
c) Political processes	5	4	3	2	1
d) Emotional support	5	4	3	2	1
e) Public encouragement	5	4	3	2	1
f) The media	5	4	3	2	1

The following statements concern your opinion about involvement of families on behalf of the Pigeon River. Please circle the number that best describes your agreement with each statement.

	Strongly Agree				Strongly Disagree
70. Support from the community is very important because it promotes community activism.	5	4	3	2	1
71. I will support any member of my family if he/she chooses to fight the pollution of the river.	5	4	3	2	1
72. I respect people who sacrifice their time/effort in fighting the pollution of the river.	5	4	3	2	1

The following question assesses your feelings, thoughts and opinions regarding specific issues. Please read carefully and indicate your personal feelings by circling the most appropriate number.

The problem of the Pigeon River makes me feel:

73.	Not at all angry	0	1	2	3	4	5	Very angry
74.	Not at all helpless	0	1	2	3	4	5	Very helpless
75.	Not at all afraid	0	1	2	3	4	5	Very afraid
76.	Not at all resentful	0	1	2	3	4	5	Very resentful
77.	Not at all depressed	0	1	2	3	4	5	Very depressed
78.	Not at all pessimistic/ discouraged	0	1	2	3	4	5	Very pessimistic/ discouraged
79.	Not at all concerned about my health	0	1	2	3	4	5	Very concerned about my health
80.	Not at all sad	0	1	2	3	4	5	Very sad
81.	Not at all like a failure	0	1	2	3	4	5	Very much like a failure
82.	Not at all like fighting a losing battle	0	1	2	3	4	5	Very much like fighting a losing battle

Please read the following statements and indicate your agreement or disagreement. The number (5) indicates high agreement, and the number (1) indicates high disagreement.

83. This community has suffered for long time from the pollution of the river.

5 4 3 2 1

84. I'm not satisfied with the community effort in fighting the pollution of the Pigeon River.

5 4 3 2 1

85. I feel like we are facing a powerful opponent who will do any thing to keep the river in this condition.

5 4 3 2 1

86. I'm concerned about the future of this community.

5 4 3 2 1

87. I feel that this community has tried everything possible to resolve this problem, but nothing works.

5 4 3 2 1

88. I feel that some of the people in our community are not helping our cause.

5 4 3 2 1

89. I feel upset when people outside our community do not understand our problem.

5 4 3 2 1

The following statements describe how people deal with stressful situations. As you read these statements think of how you as a family have dealt with the pollution of the Pigeon River, and then indicate if the statement applies to you by answering "Yes" or "No".

90. When the problem is very complicated, we feel that there is nothing we can do. ( ) Yes ( ) No

91. We start dealing with any problem by collecting more facts/information about it. ( ) Yes ( ) No

92. In our family, we prefer to discuss all the alternatives before we make up our minds. ( ) Yes ( ) No

93. We try to forget the whole thing. ( ) Yes ( ) No

94. We talk to someone to find out more about the situation and how we might deal with it. ( ) Yes ( ) No

95. It is important for us to decide who should do what in resolving a particular problem. ( ) Yes ( ) No

96. There is no need to spend time on a problem that seems unresolvable. ( ) Yes ( ) No

97. We have to make sure that a problem has a direct effect on our lives before we start worrying about it. ( ) Yes ( ) No

98. We try to come up with a couple of possible solutions to the problem. ( ) Yes ( ) No

99. We prefer to keep a low profile on a problem that affects the community. ( ) Yes ( ) No

100. We often seek out neighbors or friends who are facing the same situation to talk about what we should do. ( ) Yes ( ) No

101. Being involved in problems that affect the community could cause us troubles. ( ) Yes ( ) No

102. If a person or group of people are responsible, we talk to them about our feelings. ( ) Yes ( ) No

103. Being involved in a community problems is a sacred effort. ( ) Yes ( ) No

104. We normally feel that time makes the difference; the only thing to do is just wait. ( ) Yes ( ) No

105. We try to keep our feelings to ourselves. ( ) Yes ( ) No

106. In the last five years I have made these efforts to fight the pollution of the Pigeon River. (Check all that apply)

( ) talked with my family about the problem.
( ) supported others who are working in the problem.
( ) talked with people in the community to express my concern.
( ) attended meetings to discuss the problem.
( ) signed petitions to object the pollution of the river.
( ) participated in legal process to reverse the pollution of the river.
( ) wrote an article or letters to newspaper.
( ) organized other people's efforts to understand the problem.
( ) joined an environmental group to promote the awareness of the community toward the pollution of the river.
( ) acquired a leader position in environmental group to fight the pollution.
( ) other effort _____

107. Do you think that other methods should be tried to resolve the pollution of the Pigeon River?

Yes _____ No _____

If yes .. What methods do you suggest?

_____

_____

_____

108. Did you vote in the last presidential election?

Yes _____ No _____

If Yes go to question # 109. If No go to question # 111.

109. For whom did you vote?

Clinton ( ) Bush ( ) Perot ( ) Other ( )

110. Was your choice influenced by the presidential candidate's stand on the environment?

( ) Yes ( ) No

111. Generally speaking, do you usually think of yourself as:

a. Liberal Democrat ( )
b. Democrat ( )
c. Independent ( )
d. Republican ( )
e. Conservative Republican ( )

112. To how many voluntary groups do you belong? (give actual number)

_____

113. Please indicate your membership in the following groups. (check all that apply)

( ) Social group
( ) Environmental group
( ) Political group
( ) Service group
( ) Other group _____
( ) Religious group
( ) Sports group
( ) Charitable organization
( ) Labor Union

114. Besides the pollution of the Pigeon River, the most important concern to our family is: (Check one)

( ) Stable work
( ) Financial problem
( ) Relationships with community
( ) Time management
( ) Free time
( ) Health problems
( ) Children education
( ) Responsibilities toward the elderly
( ) Concern about the future in general
( ) Life satisfaction in general

115. Please indicate types of hobbies, activities, and social involvements your family prefers doing together.

_____
_____
_____

116. What is your family's income per year, after taxes?

a. ( ) Less than $5,000
b. ( ) $5,000 to 9,999
c. ( ) 10,000 to 14,999
d. ( ) 15,000 to 19,999
e. ( ) 20,000 to 24,999
f. ( ) 25,000 to 29,999
g. ( ) 30,000 to 34,999
h. ( ) 35,000 to 49,999
i. ( ) 50,000 to 69,999
j. ( ) Over 70,000

Please read the following statements and write a few sentences that reflect your opinion about each statement.

117. I would become actively involved in fighting the pollution of the Pigeon River if

_____

_____

_____

118. If I'm asked to become involved in fighting the pollution of the river, I expect that

_____

_____

_____

119. I don't think that I should become involved in the Pigeon River problem because

_____

_____

_____

120. Who lives in this household?

Husband --- Wife --- # of Children ---- Grandparents --- Others -----

121. What are the ages of

Husband --- years Wife --- years Children --- yrs --- yrs --- yrs --- yrs

122. Number of years of formal education

	Husband		Wife	Children 1	Children 2
a)	( )	0 - 8 years	( )	( )	( )
b)	( )	9 - 11 years	( )	( )	( )
c)	( )	12 yrs (High school)	( )	( )	( )
d)	( )	13 - 15 years	( )	( )	( )
e)	( )	16 yrs (college degree)	( )	( )	( )
f)	( )	17 + years (graduate study)	( )	( )	( )

That was the last question. Thank you very much for your help. If you would like to receive a letter describing the findings of the study, please detach the bottom of this sheet, place your name and address where indicated, and return the slip with the completed questionnaire.

Name _____

Address _____

_____

VITA

Hussein H. Soliman was born in Suez, Egypt on April 26, 1950. He attended elementary and high schools in Helwan Cairo. In October 1968, he attended College of Social Work in University of Helwan, and received the degree of Bachelor of Social Work in May 1972. Hussein worked as a school social worker in Suez, Egypt from 1972 to 1981. He worked for the Ministry of Education in Yemen from 1981 to 1985.

In August 1985 Hussein came to the United States to pursue higher education. He entered University of Southern Mississippi and received a Master of Social work in August 1987. While he was a student in Southern Mississippi, he had special interest in social work research. He received the Honor Award for his research dealing with the provision of social services to people with AIDS. Hussein attended both University of New Orleans and Jackson State University as a post Master student.

In 1989, Hussein entered the University of Tennessee to pursue the Doctoral degree in Social Work. As a graduate student, he worked with Dr. Charles Glisson on a research grant from the National Institute of Mental Health from August, 1990 till August 1993. The research grant evaluated mental health services provided to children in the state custody. Hussein joined the faculty of the school of Social work at Southern Illinois University, and he will teach research, mental health services and human behavior and social environment to both graduate and undergraduate students. As you might notice, the month of August has been a remarkable month in Hussein's professional career.