DEMOGRAPHIC AND ENVIRONMENTAL FACTORS AFFECTING FERTILITY DECISIONS IN SWAZILAND

Dissertation for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY
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1977

This is to certify that the

thesis entitled

DEMOGRAPHIC AND ENVIRONMENTAL FACTORS AFFECTING FERTILITY DECISIONS IN SWAZILAND

presented by

Helena E. Wallender

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Family Ecology

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Date June 30, 1977

ABSTRACT

DEMOGRAPHIC AND ENVIRONMENTAL FACTORS AFFECTING FERTILITY DECISIONS IN SWAZILAND

By

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Since rapid population growth became a concern, valuable time has been lost in too much emphasis in trying to understand global population trends, while research on the family level has been neglected. This study attempted to explore factors affecting fertility decisions in Swaziland, involving both men and women. The specific purpose of the study was to analyze the relationships between demographic variables, such as sex, age, number of children, and environments to aspects of fertility decisions. The study focused on such aspects as fertility goals and standards, attitudes about fertility control, levels of information about reproduction, hygiene, child care, nutrition, farm practices, use of community resources and income.

A home management framework was employed in the study. The reported desired family size was regarded as fertility goals and the ideal number of children as fertility standards. Measuring attitudes about fertility control, being of importance in directing fertility choices, was of special interest. For the measurement of attitudes a Guttman-type scale was developed having a reproducibility

coefficient of 0.85. In order to measure levels of information, scores were computed from answers on short fixed alternative questions. Use of community resources was measured by a ratio of "utilized" over "available" community resources. An already available scale was used in measuring farm practices. Three areas of diversified environmental characteristics were selected for the implementation of the study. The areas were Velezizweni, Luyengo and Bhunya. Veleziweni is a rural area with a predominant subsistence economy and many features of traditional Swazi living. Luyengo can be defined as a semi-rural area of mixed economic and social systems, and Bhunya as an urbanized area, created in connection with the establishment of a pulp mill. The total population within determined boundaries in Velezizweni and Luyengo was investigated, while a random sample was drawn from the total population of Bhunya. Seventy-three men and ninety-six women were interviewed. Information about the use of community resources, farm practices and income was only collected from men, while information about hygiene, child care and nutrition was only collected from women. Sixty-one percent of the sample was matched couples. Couples' composite resourcefulness score and mean attitudes about fertility control were tested against number of children and environment. The data were collected in July 1976 by students from the College of Agriculture at the University of Botswana and Swaziland.

Least squares analysis was used in order to test relationships. Significant results at a .01 alpha level were obtained for the effect of the environment on a number of variables. Of greatest

magnitude were, in order, population attitude scores, income, farm practice score and hygiene score. Sex was found to have a significant effect on attitudes about fertility control and levels of reproductive information. Women were more positive about the control of fertility and had a higher level of reproductive information than men. Age and number of children were found to have a non-significant effect on all dependent variables in the study.

The major conclusions drawn from findings in the study were that traditional fertility values tend to be prevalent in less advanced stages of social and economic environment. Men have more traditional fertility values than women and are less motivated to control fertility. The level of reproductive information tends to decrease in the transformation to a modern society. Age was not a determining factor on attitudes about fertility control, fertility goals, standards nor levels of information. Since the actual number of children did not influence fertility goals, standards and attitudes about fertility control, it was concluded that fertility behavior in the three investigated communities was not goal-oriented.

A major implication for home economics program development in contributing to fertility decline is the necessity of involvement in reshaping the family environment. Programs should direct themselves both to men and women. Training of decision-making skills should be implemented in a number of home economics subject areas. Families should be assisted with bringing fertility decisions to a level of awareness, resulting in rational and conscious decisions about family size. General policy implications are continuous

emphasis on rural development, establishment of rural industries and decentralization of political decision making.

An in-depth study over a period of time, selecting a few families from each area, was recommended for gaining a full ecological perspective on fertility decisions.

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By

Helena Eva Wallender

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Family Ecology

1977

ACKNOWLEDGMENTS

It was a feeling of inadequacy as a home economics extension worker in Africa faced with the overwhelming problems of social and economic development that brought me to graduate studies at Michigan State University. A special note of thanks goes to my supervisor Miriam Kelley, former head of Family Living Education in Michigan, who assisted me with admission procedures, particularly confusing for a foreign student.

During nearly three years of course work in East Lansing, I was given many opportunities to learn about development problems and activities from extremely qualified teachers and fellow students with unique experiences. My perspectives were, indeed, widened through continuous discussions, sharing of ideas and hopes for a more equalitarian world.

The person closest to me, my late husband David Wallender, had the deepest impact on my professional development. His independent, creative thinking and sincere devotion for development work in Africa have given me much inspiration and challenge.

I am deeply grateful for the warm support of faculty members and students in the Agricultural Economics Department and in the College of Human Ecology and other friends at the time of Dave's death. It helped me through a very difficult time and has contributed much to the completion of my study program.

I was very fortunate to have Dr. Beatrice Paolucci appointed as my advisor and dissertation director. For her unfailing support, encouragement and inspiring guidance, I am deeply indebted. She went far beyond her responsibilities as a major professor. My appreciation is also extended to the members of my guidance committee, Dr. Margaret Bubolz, Dr. Linda Nelson, Dr. James Zuiches and Nancy Axinn, who provided expert advice and constructive criticism.

Field research in Africa became possible in connection with an assignment with the Food and Agriculture Organization of the United Nations to the College of Agriculture, University of Botswana and Swaziland. The support by FAO and UBS in carrying out this study has been much appreciated. My supervisor Caroline Fredrickson, my colleague Britta Ogle, many other colleagues and friends gave encouragement and made adjustments in order for me to pursue the research work. I am grateful to the colleagues in the African Language Department, who helped with the translation of the questionnaire.

I owe special gratitude to Professor Alastair McArthur, Lincoln College, New Zealand, who was on the faculty of UBS 1975-1977. He generously took his time for discussions and gave advice about the design of the study and the analysis of the data. Valuable assistance with the computer analysis was provided by Steven Norton and Hans van Kesteren at the Data Process Unit at the Livestock Project at the Ministry of Agriculture, Mbabane. Many officers in the Ministry of Agriculture, Health and Education, the

Central Statistical Office and the Census Office gave important assistance.

The hard work of the students as enumerators and coders was deeply appreciated. Without their contribution the study would not have been possible to implement. My sincere thanks are also extended to all the Swazi families who generously provided the information.

It is my wish that the findings of this study will contribute to a sound development of home economics programs in Swaziland.

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CHAPTER I

INTRODUCTION

Statement of the Problem

One of the most serious threats to human existence in the world today is the imbalance between resources and population. One can argue that this imbalance is created by an unequal distribution of resources between poor and rich countries, between social classes in poor countries, and even due to an unequal distribution of resources between men and women. Estimates of food resources and other raw materials, services, as well as population, are made on a worldwide scale every year. They have lately shown very gloomy perspectives (1973).

Far less is known about the situation on the micro-level, i.e., resources available and utilized by individual families. This is particularly true for families in transitional stages in a developing money economy. In order to achieve family goals, as well as national development goals in congruence with standards set, organization of resources is of utmost importance.

While fertility behavior in the developed world tends to be increasingly determined by rational family decisions and social and economic differentials are decreasing in importance, fertility behavior in the developing world is still puzzling. Interventions into the traditionally balanced birth and death rates mainly through

improved public health services, as well as disintegration of traditional family and economic systems, have resulted in rapid population growth. An understanding of motivational forces to control fertility, of which families' fertility standards and goals are an integral part, can no longer be neglected. Any family-oriented program with the ultimate goal of improving the quality of life of individual families, being agriculture or home economics extension, nutrition, social welfare or community development programs, needs to concern itself with the understanding of these processes.

With an annual population increase of 2.7 percent, which means a doubling of the population in less than 26 years (World Population Data Sheet, 1977), the government of Swaziland is realizing the importance of slowing population growth (Second National Development Plan, 1973-77). An official policy is not yet established but is expected to be developed soon. It is hoped that this study will throw some light on processes within families leading to a fertility decision, and suggests strategies for program development within the area of home economics, with an immediate impact on the development of the Home Economics Diploma Course at the University of Botswana and Swaziland.

This study was undertaken to test relationships of demographic variables and environments to aspects of fertility decisions such as goals, standards, attitudes about control of fertility, levels of information, use of community resources and income.

The overall research questions posed were:

1. What is the relationship of demographic variables such as sex, age, and number of children to goals and standards of family size, attitudes about control of fertility, levels of information, use of community resources and income?

2. What is the relationship of environments to goals and standards of family size, attitudes about control of fertility, levels of information, use of community resources and income?

Conceptual Framework

The conceptual framework employed in this study was a home-management framework. Management has been defined as a means of achieving goals through the use of resources (Nickell, Rice, and Tucker, 1976: 31-53). Gross, Crandall and Kroll (1973) traced the short history of home-management through the following chronological stages: resource-centered, human-centered, process-centered, and values-centered. A recent emphasis has been a systems approach (Deacon and Firebaugh, 1975), of which the behavioral interactional (Nickell, Rice, and Tucker, 1976) and the family ecological (Steidl, 1969; Hook and Paolucci, 1970; Paolucci, Hall, and Axinn, 1977) are two examples. The ecological emphasis, stressing the interrelationship between the household unit and its environments, was the most relevant for this study.

The purpose of management at all levels, national, familial, or individual, is the conscious improvement of the quality of life. National development in itself is the application of the concepts of

management, i.e., human controlled development in the effort of raising levels of living in a nation. Being a part of this process, families and individuals will need to participate, to an increasing degree, in management processes learning to manage family situations. One of the major arenas of family management is that of making decisions about the size of family in relation to resources available for maintaining adequate levels of living and the achievement of an optimum quality of life.

In order to reach goals about family size, resources must be used. Resources have been classified in different ways--"human and material, economical and noneconomical, and tangible and intangible" (Deacon and Firebaugh, 1975: 158). Using any classification, resources can be regarded as assets consisting of "any worthwhile possession, personal quality or trait of value, or characteristic of the environment that has use" (Nickell, Rice, and Tucker, 1976: 34). Consequently, attitudes toward control of fertility as well as knowledge of hygiene, child care, nutrition, reproductive biology, modern farm practices, level of education and income are human resources to be used in decisions about family size.

The management process consists of several subsystems requiring decision making: a mental activity leading to the choice among perceived alternatives best conforming with goals, standards, and available resources. The managerial process can be broken down into these four main functions (Nickell, Rice, and Tucker, 1976): planning to achieve goals, organizing for performance, implementing

the plan, and evaluating the results in light of goals sought. The management process is complex and continuous, and the functions interrelated. The outcome of the implementation is fed back to a new planning phase and long-term goals might be changed, or new goals might be stated.

The criteria for the evaluation of goals are standards. Every society has standards which can be traced back to cultural value based patterns. Standards are dynamic because they stimulate individuals or groups to action, self-imposed or socially inflicted. There is a standard set, consciously or unconsciously, for each kind of activity determined by what is expected to provide maximum satisfaction.

"Ideal" number of children is an indicator of a family size standard, while the "desired" family size could be looked upon as a family size goal.

The home management process is shaped by the environmental setting in which the family functions. Deacon and Firebaugh (1975) defined the environment as "a set of elements, conditions, and properties outside a system that can produce change in the system" (p. 14). The components of the environment are physical, biological and social (Steidl, 1964). Using a systems approach, Gross, Crandall and Knoll (1973) concluded about the function of the environment:

> In general, the transaction between the family and its environments, whether input or output from the viewpoint of the family, might be classified as (a) providing resources or serving as a constraint if appropriate

> resources are not available and (b) either motivating or demanding action. Exchanges might take the form of effort (either physical, mental, or emotional and either natural or technical), material objects (animate or inanimate), men, money, or information (p. 15).

In response to their perception of social and economic changes in the environment, men and women alter their goals, standards, and attitudes. In this study the ecological emphasis seemed appropriate to examine the relationship of environments to aspects of family size decisions.

Assumptions

1. Areas selected represent different stages in the transformation from a subsistence to a money economy.
2. Families have a conception of "ideal" and "desired" family size.
3. Families set goals in order to solve problems, respond to demand requirements and expectations.

Definitions

Environment: Describes different stages of economic development from a subsistence to a money economy and accompanying degrees of traditional Swazi and Westernized life styles.

Family size standard: The number of children reported as "ideal."

Family size goal: The number of children reported as "desired."

Population attitudes: Endorsed or non-endorsed statements of beliefs about family size.

Community resources: Services available to households in the community.

Family resources: Include the formal level of education, levels of information about hygiene, child care, nutrition, reproductive biology, modern farming methods of males and/or females, and cash income.

Family: A group of people who make a common arrangement to provide themselves with food and shelter. A family may occupy more than one house.

Couple: A man and a woman committed to each other in a legal or nonlegal union and living together.

CHAPTER II

RELATED RESEARCH AND LITERATURE

The research and related literature will be reviewed under three major headings--conceptual framework for fertility studies, population studies in developing countries, and population studies in Swaziland.

Conceptual Framework for Fertility Studies

Malthus (1803) was a pioneer in studying human populations. He was the first to point out that the human population cannot grow indefinitely in geometric progression. The core of his controversial theory was that poverty and lack of food will check population growth. He has been criticized for not being able to foresee the technological development to come, particularly in relation to food production, transportation, and birth control methods, and for encouraging laissez-faire socioeconomic policy. Malthus' arguments did, nevertheless, give rise to the still-continuing polemic about the population dilemma.

Since Malthus, fertility behavior has basically been studied through four main analytical frameworks: the theory of the demographic transition, the sociological framework, the economic framework which recently has been related to the fourth and least explored--the family management framework.

The theory of the demographic transition (Notestein, 1945) is basically a description of the sequence of events which are assumed to take place on a macro level when a society moves from high to low death and birth rates. The theory builds upon the experience from Europe where the transition started at the time of the Industrial Revolution and lasted 100-150 years. It does not actually explain any critical aspects of the problem of the onset of fertility decline. Generally, the interpretation of the cause of events has been that decline of death rates, caused by a rise in living standard as well as advances in such areas as medicine and sanitation, creates an awareness on the part of individual couples that fewer children will need to be born to attain desired family size. Thus, birth rates will fall and at the same time a smaller family size norm will develop.

Lately this interpretation has been challenged by Coal (1973) who, after closely studying several European provinces, proposes that fall in birth rate can take place in advance of social and economic development and in advance of falling death rates. He found that the main factor for differences in fertility levels were similarity of cultural and linguistic setting. However, no particular level of development that triggered a reduction of fertility could be identified.

It is generally assumed that developing countries will go through the same demographic transition as in the European case. So far, death rates have fallen drastically from 30-40/1,000 to 15-20/1,000 during a period of 20 years, without a major fall in

birth rates. A slight global drop in birth rates was, however, recorded in 1977 (Population Reports, Series J, No. 13, Jan. 1977: J237-J239).

The sociological framework can best be characterized by the employment of certain variables such as geographic area, urban-rural residence, socioeconomic status, religion, and ethnic group in explaining differentials in fertility. Among the white population in the USA, fertility differentials have continuously declined in importance. This is particularly true for the three first-mentioned variables, while the differentials by ethnic group and possibly also those by religion have widened in recent years (Kiser, Wilson, and Campbell: 1968). In developing countries, on the other hand, the urban-rural differential as well as socioeconomic status continue to have a strong influence on fertility levels.

Clay and Zuiches (1977) found the identification with the family of orientation as well as reference groups to be important intervening variables in shaping family size norms. It appears that norms and value patterns surrounding family size and childbearing will increase in importance for future fertility decisions both for individuals concerned, and consequently for the aggregate growth or decline of the population.

Davis and Blake (1956) worked out a framework for comparative analysis of fertility. It is built around the obvious steps in the process of reproduction, generally recognized in human culture: (1) intercourse, (2) conception, and (3) gestation and parturition. They labeled the factors which are connected with

cultural conditions influencing fertility, intermediate variables. The framework is useful in cross-cultural comparisons of fertility since all these factors are present in every society and have a positive or negative effect on fertility.

Including Davis' and Blake's intermediate variables, as well as norms about the same, Friedman (1967) developed a comprehensive sociological framework, covering several variables discussed above. This model can be illustrated as follows:

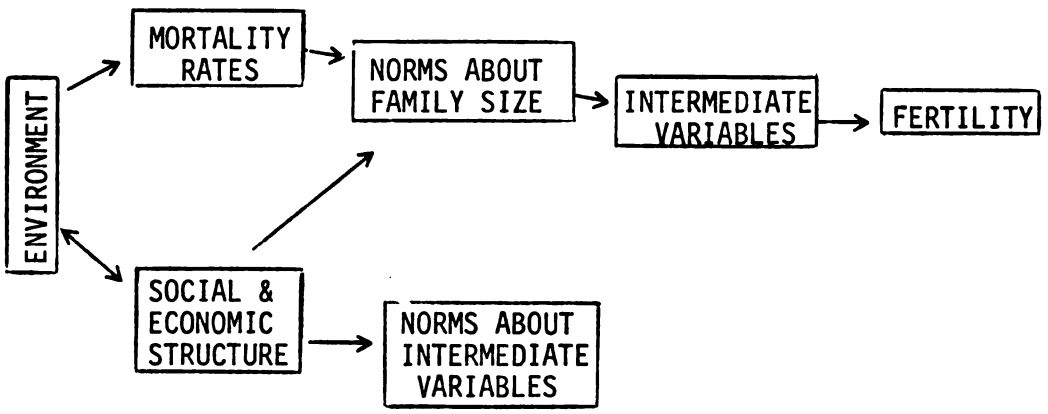

Figure 1.--Model for Viewing Fertility Behavior.

While sociologists have included economic aspects in their analytical frameworks of studying human fertility behavior, economists have concentrated on effects of income. Their emphasis has mainly been on the macro level, studying relationships between such variables as per capita income and percentage of the population involved in agriculture on the one hand, and fertility levels on the other. Century-long observations of industrial countries and more recently of developing countries suggest that economic progress

and decline in fertility go hand-in-hand. Much research has pointed to the fact that there is a "threshold" or "take-off" point in economic development below which birth rates will remain high.

Leibenstein (1957) used the concept "critical minimum effort," meaning that economic backwardness can be characterized by a set of related factors that possess a certain degree of stability. They can, in fact, be considered equilibrium valves in the short run. One of these is the population variable, the value of which will remain the same if the stimulus of all factors is too small, that is, if it is below the critical minimum required for persistent economic growth.

A fruitful approach, in explaining the incentive or rationale behind the desire to have larger or smaller families, has rather recently been adopted from microeconomic theory. Assuming that parents' fertility decisions are rational, Leibenstein (1957) developed a benefit-cost analysis of fertility behavior. In other words, as long as parents have more children, they are deriving utility from an additional child as a consumption good, as a source of personal pleasure, as a productive agent, or as a source of security.

Also building on microeconomic theory, Becker (1960) developed his theory of household choice as the underlying mechanism of fertility behavior. His thesis is that choices come about as the result of the interaction between preferences on the one hand, and income and price constraints, on the other. He found in his analysis that different aspects of children are valued in developed compared to developing countries. In the former countries, parents

value consumption aspects, while in the latter, production aspects of children as economic goods are predominant. Becker's findings further indicated that increase in women's market wages, as well as increased cost of her time in household production, will cause a decline in fertility.

De Tray (1972) elaborated on the utility theory and worked out a model of expected utility analysis for substitution between quantity and quality of children. Similarly, he found that female time and female level of education were of great importance for increasing child quality with implication for substitutability of the two inputs.

Population Studies in Developing Countries

Except for censuses, administrated in most developing countries on a regular basis, KAP surveys have been population studies most commonly undertaken. These are surveys to determine the extent of family planning knowledge, attitudes, and practice in a community, region or country. In 1970, in not less than 67 countries, of which 15 were African, such studies had been completed or were underway (The Population Council, 1972).

A KAP survey has four major purposes: descriptive in regard to knowledge and beliefs about fertility, evaluative providing baseline data for family planning programs, directive for program development, and validative for reporting about acceptance generated by a family planning program. Questions usually cover vital data, attitudes toward family size and family limitation,

knowledge about reproductive physiology and contraceptive methods, as well as practice (The Population Council, 1970).

With the attempt of standardizing questions, this impressive body of cross-cultural data has made comparisons on a global scale possible. Mauldin (1965) compared findings from 44 studies, and he found strong motivation for limiting family size; in every society, two-thirds or more of the persons having four or more children indicated that they did not want to have more children. In another worldwide comparison, Berelson (1966) found similarities in response by similar stages of economic development and was able to show that various social differentials corresponded with attitudes to fertility and family planning.

The KAP approach has been developed within the framework of the theory of the demographic transition. Caldwell (1976) believes that the failure to update the theory has led to much misunderstanding and frustration, as well as inadequate research. He does not see inadequate methodology as the basic problem but "poor application, especially in application of methods in cultures other than those for which they were developed" (p. 336). He points at four specific pitfalls of current fertility research in developing countries: (1) the neglect and misunderstanding of the magnitude and direction of wealth (money, goods, services, guarantees) flows and potential flows; (2) the fact that the "family" of the fertility survey is often an artifact of the survey, disregarding the decision power of the extended family; (3) using only the wife as a

spokesperson; (4) too much emphasis on modernization in the attempt of studying change related to fertility transition.

Population-Related Studies in Swaziland

Population censuses have been carried out decennially in Swaziland since the beginning of the century. The 1966, as well as the six previous censuses, was undertaken by the British administration. An earlier census, in 1898, was administrated by the South African Republic in connection with tax collection. The last census, August 1976, was the first to be implemented by the Swazi government. While age, marital status, literacy, occupation, and ethnic groups have been covered in all censuses since the beginning of the century, only the censes of 1946 and 1966 included fertility as a special topic.

The final report from the 1976 census was not available when this was written. Preliminary figures, however, suggest a total population of 520,297 people (Central Statistical Office, 1977).

The methodology used in the 1976 as well as the 1966 census was household enumeration by the canvasser method. Data were collected de juro, since estimates of absentees are important, being a common phenomenon in Swaziland, which supplies the Republic of South Africa with a substantial number of immigrant workers. In 1966, 5 percent of the total population of Swaziland was reported to be absent. Other findings from this census (Jones, 1968: 203) were that the mean household population was 6.9, with the largest

household size 7.4 in the central region. It was further estimated that the average African woman in Swaziland, if she lived to be 50, would bear approximately seven live-born children. Of these seven children, two can be expected to die before reaching the age of 15, thus leaving five who will survive to adulthood.

The crude birth rate was estimated at 47-48 per thousand, the crude death rate at 20-21 per thousand, infant mortality at 172 per thousand live births, and life expectancy at birth to 44 years (Jones, 1968: 211, 213, 215).

In 1975 the first demographic survey (Gani, 1975) was undertaken in Swaziland, with the main objective to ascertain whether birth and death rates were changing significantly from the findings of the 1966 census. The survey was also undertaken with the purpose of providing a check on the system of vital registration which was also simultaneously contemplated to be introduced on a compulsory, nationwide basis. The findings have, at this writing, not officially been released.

Although agricultural statistics were registered in the 1966 census, a special "Agricultural Sample Census" (Central Statistical Office, 1973), concentrating on agriculture in the subsistence sector, was carried out in 1971-72. In addition to commonly reported population characteristics, characteristics such as "active in agriculture," "paid employment in agriculture," and "main occupation of population active in agriculture" were registered in a special section of farm population.

A large nationwide survey was undertaken in collaboration with the Swaziland administration and the University of Natal in 1960 in order to determine development potential and policy in Swaziland (Holleman, 1964). A multi-disciplinary research approach was used in covering social, anthropological, demographic, economic, and agricultural aspects. The survey resulted in a wealth of tabulated information and a statistical instrument of "sufficient stability to allow comparative analyses to be made from time to time in order to assess the trends and measure development, and of sufficient flexibility to permit the assessment of local differences, present and future" (p. 22).

Two studies were undertaken in connection with the establishment of the Home Economics Diploma Course at the University of Botswana and Swaziland; one was a survey (Ministry of Agriculture, 1970) in which approximately 150 women were contacted for the purpose of providing baseline data for home economic program activities, and the other was an investigation resulting in recommendations for curriculum for the same course (FAO, 1971).

A focus on population attitudes and fertility history is a part of Allen's in-depth study of "Dimensions of Swazi Households in Rural and Urban Areas" (1973), as well as Koza's descriptive "Proposed Guidelines and Models for a Home Economics Family Planning Program in Swaziland" (1974). Allen found the medians of family size norms to be three to four children in the urban area and five to six children in the rural area. She also found that 82.6 percent of women in the rural area she studied believed that children die

more frequently in the current situation than they did in the past. The figure for the urban area was 65.9 percent.

Another finding from the same study was that the great majority of women were very vocal in their dislike for polygyny, which was said to be a source of much quarrel, tension and favoritism. Moreover, an overwhelming majority of women in both the rural and urban area felt that it was really God's will that determined the number of children women had. They also felt that women were having more children now than in the past. However, 82 percent in the rural area and 65.9 percent in the urban area wanted smaller families, and expressed a strong desire to limit their number of children in order to provide food, clothing and schooling. Allen (1973), nevertheless, concludes that:

> However interested many women are, they have often been thwarted in their attempts to obtain and/or use birth control methods. Resistance and antagonism of husbands, difficulties in obtaining information, expense of the method, fear for their health--all combine to make the numbers of women using birth control methods small (p. 363).

CHAPTER III

PROCEDURES

The overall design of the study can be defined as survey research with both descriptive and explanatory components. Structured interviews with men and women were used as a method of gathering data. Sixty-one percent of the people interviewed were husband and wife. The questions were, with a few exceptions, of fixed-alternative type. Attitudes towards control of fertility and farming practices were measured by Guttman type scales.

Research Design

The study was undertaken to test relationships between demographic variables and environments as they relate to fertility decisions; family size goals, standards, attitudes about fertility control, and levels of information about reproduction, hygiene, child care, nutrition and farm practices.

Research Hypotheses

The following research hypotheses were stated:

H_0 1: There is no effect of sex on . . .

a. desired number of children
b. ideal number of children
c. attitudes about fertility control
d. knowledge of reproduction

H_0 2: There is no effect of age on . . .

a. desired number of children
b. ideal number of children
c. attitudes about fertility control
d. knowledge of reproduction

H_0 3: There is no effect of age of females on . . .

a. knowledge of hygiene
b. knowledge of child care
c. knowledge of nutrition

H_0 4: There is no effect of age of males on . . .

a. farming practices

H_0 5: There is no effect of age of males on family . . .

a. use of community resources
b. income

H_0 6: There is no effect of actual number of children on . . .

a. desired number of children
b. ideal number of children
c. attitudes about fertility control
d. knowedge about reproduction

H_0 7: There is no effect of actual number of children of couples on . . .

a. resourcefulness
b. attitudes about fertility control

H_0 8: There is no effect of environment on . . .

a. desired number of children
b. ideal number of children
c. attitudes about fertility control
d. knowledge about reproduction

H_0 9: There is no effect of environment on female . . .

a. knowledge of hygiene
b. knowledge of child care
c. knowledge of nutrition

H_0 10: There is no effect of environment on male . . .

a. farming practices

H_0 11: There is no effect of environment on family . . .

a. use of community resources
b. income

H_0 12: There is no effect of environment on couples' . . .

a. resourcefulness
b. attitude about fertility control

TABLE 1.--Summary of Tested Relationships.

Dependent Variables	Independent Variables			
	Sex	Age	Actual No. of Children	Environment
Desired number of children	*	*	*	*
Ideal number of children	*	*	*	*
Population attitude score	*	*	*	*
Reproduction score	*	*	*	*
Hygiene score		*		*
Child care score		*		*
Nutrition score		*		*
Farm practice score		*		*
Resource utilization score		*		*
Income		*		*
Resourcefulness score			*	*

*Indicates tested relationships.

Development of Instruments

Two instruments, an A and a B questionnaire for interviewing males and females (see Appendix A), were used in collecting data, both covering, with a few exceptions, identical sections of questions about family size, marriage, reproduction information, and the population attitude scale. In addition, the A questionnaire, used for interviewing women, included sections about hygiene, child care, and nutrition information. In the B questionnaire, used for interviewing men, sections regarding general household information, utilization of community resources, cash family income, and the farm practice scale were similarly added. This dissertation is based only on a part of the data collected.

Development of the Population Attitude Scale

Guttman's method of scalogram analysis (Guttman, 1950) was chosen for measurement of attitudes toward fertility control. The Guttman scale has been proven to be a useful research tool for measurement of cumulative change, particularly when examining small shifts in changes in attitudes.

Items on the Guttman scale have the properties of being ordinal and cumulative. Both the items and the respondents are discriminated and placed in their order of magnitude. A certain score obtained on a scale will indicate exactly which scale item the respondent has endorsed and which has not been endorsed--with a certain percent error for the sample as a whole. The degree of errors or deviation from the perfect scale pattern is commonly

expressed in reproducibility coefficient, computed from the following formula:

$$R = 1 - \frac{\text{no. of errors}}{\text{no. of responses}}$$

The development of the Population Attitude Scale took part in the following steps:

1. Unstructured interviews, December 1975
2. Derivation of attitude statement, December 1975
3. Selection of attitude statement, December 1975
4. Pilot study, January 1976
5. Scale analysis, February 1976
6. Reliability testing, March-June 1976

About 60 unstructured interviews with women in different age groups were first carried out and recorded in different environments, similar to the selected research areas. (For guidance questions, see Appendix B). The interviews were conducted in siSwati by female students from the College of Agriculture, UBS. From the recorded material, a pool of attitude statements was derived. In order to select a manageable number of statements for scalogram analysis the same students were instructed to judge individually the percentage--0, 20, 40, 60, 80, or 100--of the interviewed women who would agree to the statements. Statements obtaining an average percentage ranging from 0-20 and 80-100 were omitted for having a low discriminatory value. After this procedure, 21 statements remained.

In order to facilitate a scalogram analysis, 80 different women, again in areas of similar characteristics to the selected research areas, were interviewed and agreement/disagreement to the items were recorded. Respondents were assigned a score of one for each "correct" and a score of zero for each "incorrect" agreement/disagreement. Statements which had received a high degree of "don't know" were first cancelled. After scalogram analysis, 14 statements were finally selected, having a reproducibility coefficient of 0.845, which was considered to be acceptable. Thus the maximum score of 14 indicates an extremely positive attitude, while a score of 0 indicates an extremely negative attitude towards the control of fertility.

The statements with answers adding up to a maximum score were grouped under headings for agreement and disagreement (see page 25). In the reliability test, as well as in the final instruments, the items were listed in a random order.

A reliability test of test/retest type was carried out on 30 respondents with about a two-month interval. The correlation coefficient between the answers was 0.81.

Farm Practice Scale

In the B questionnaire another Guttman scale measuring farm practices was included (see Appendix A, page 112). This scale was developed during the maize storage research carried out by the University in Velezizweni. The scale has a reproducibility coefficient of 0.91. It was used in all three research areas. Even in

POPULATION ATTITUDE SCALE

		Agree	Disagree
1.	In order to decide how many children one wants, husband and wife must cooperate.	X	
2.	It is better to decide on the number of children one wants, because by doing so one is able to manage them properly.	X	
3.	Most mothers want fewer children because then each can get the best in life.	X	
4.	Most mothers want fewer children because men fail to support them nowadays.	X	
5.	It would be desirable to be able to decide how many children one gets.	X	
6.	Nowadays there are means to decide how many children one wants.	X	
7.	In the next generation no woman should have more than five children.	X	
8.	Parents should have as many children as they like as long as they can support them.		X
9.	One cannot decide how many children one would like to have.		X
10.	There is no limit to the number of children a person should have.		X
11.	A woman should get many children in case some die.		X
12.	More children should be born in Swazi land.		X
13.	There is no way of preventing pregnancies.		X
14.	Most women want to have a lot of children.		X

Bhunya, the selected urban area, men participated somewhere along the line in the farm management process on the home farm. Questions about farm practice were therefore not irrelevant. Further, most of their home farms can be assumed to be located in an area with similar characters to Velezizweni, the selected rural area.

Measurement of Variables

The variables, except for population attitudes and farm practices, were measured by short fixed-alternative questions of multiple choice or yes/no type with follow-up probing questions of the type "If yes/no, why?" Short open-ended questions were also used (see Appendix A). Several questions from the Home Economics Survey in Swaziland (Ministry of Agriculture, 1970) were adopted and included in the study.

Separate sheets, listing available environmental resources, were developed for each research area (see Appendix A, pages 108-111). Based on the information recorded, ratios were developed to measure use of community resources.

Composite scores were computed to measure levels of information and resourcefulness. Below are given maximum scores as well as mean scores and standard deviations for all of the measures employed in the study. Figures are based on data from the largest sample of this study.

Desired number of children.--Desired number of children is the number answered on the question: "If you would have exactly the number of children you want, what would that number be?"

Ideal number of children.--Ideal number of children is the number answered on the question: "What do you think would be the ideal number of children for Swazi families, if they could control the number as they wish?"

Attitudes towards fertility control.--Attitudes about control of fertility were measured by an attitude scale of Guttman type. The maximum score was 14, the mean, 8.89, and the standard deviation, 2.91. Couples' attitude about fertility control was the mean of the men's and women's attitude scores.

Determining information scores.--Level of information of reproduction, hygiene, child care, and nutrition was measured by computing the composite scores on selected questions in the respective sections of the questionnaires. Questions were of multiple choice and yes/no types, indicating level of information and practices. "Correct" answers are indicated by an asterisk (*) in Appendix A for respective questions.

In determining reproductive biology score, questions number 1, 2, 3, 4, 5, 6 and 7 from the section "Reproduction" (see Appendix A, page 122) were used. One point was given for each correct answer. The maximum score was 7, the mean was 2.74, and the standard deviation, 1.02.

In the same way, questions 1, 2, 3, 5, 6, 7, and 8 from the section "Hygiene" were used to measure the level of hygiene information (page 120). Maximum score was 8, the mean, 4.16, and the standard deviation, 1.76.

In measuring the level of information of child care, questions 1, 3, 4, 5, 6A, 6B, 7, and 8 in the section "Child Care" were used (page 124). The maximum score was 8, the mean, 5.31, and the standard deviation, 1.25.

Nutrition information was measured by questions 1, 2, 3, 4, 5, 6, 7, and 8 in the section "Nutrition" (page 125). The maximum scre was 8, the mean, 3.37, and the standard deviation, 1.42.

Utilization of community resources.--The degree of utilization of community resources was the ratio between utilized resources by the family, versus available resources, as reported by husbands. The mean was 48.1538 and the standard deviation, 2.12.

Farm practice score.--Farm practice score was measured by a Guttman type scale (see Appendix A, page 112). The maximum score was 10, the mean, 3.78, and the standard deviation, 2.95.

Income.--Income was the cash family income during the previous year as reported by husbands. Figures were coded in 10 classes.

Mean number of children of couples.--Mean number of children of couples was the mean number of children of the man's and woman's children.

Resourcefulness.--Couples' resourcefulness was the sum of the scores on the farm practice scale, hygiene, child care,

nutrition, and reproductive information. The total maximum score was 41, the mean, 23.70, and the standard deviation, 4.76.

A calendar of events recently updated for use in the census was used as an estimation when age was not known.

At an early stage questions were distributed to specialists in areas covered in the questionnaires, asking for their reaction and comments. For example, questions dealing with nutrition knowledge and practice were given to both national and expatriate nutritionists in the Ministry of Agriculture and at the University. Questions on child care, hygiene, health and family planning were in the same manner discussed with experts in the public health units of the Ministry of Health. Census staff were contacted about the census type questions. The complete first drafts of the questionnaires were further discussed with a number of Home Economic Extension Agents, particularly with those working in the research area.

After revision of the first draft questionnaires, second drafts were tested in 25 interviews with both women and men. The major finding during these interviews was that the sequence of the sections needed to be changed in such a way that questions demanding more thought and consideration by the respondents needed to be at the beginning of the interview, while easier questions were left to the end.

After preliminary tabulation, revision, and editing the final questionnaires of the English version took shape. They were translated into siSwati by the African Language Department at the

University, and later on back-translated by staff who had not previously been involved. On several points, problems of linguistic equivalence were thus brought up and discussed. This procedure was again followed through by the enumerators, some of whom had not earlier participated in the preparatory phase of the study.

Data Collection

About one year before the actual data collection took place, authorities on a national, district, and also local level were informed about the planning of the study, and their approval was obtained. Governmental expertise, already involved in the development of the instrument, was kept up-to-date with the implementation. The district commissioner of Manzini district, in which all three research areas, Velezizweni, Luyengo and Bhunya, are located, was contacted again and enumerators introduced to him just before the start of the actual data collecting period. Agricultural and home economics personnel were similarly contacted. The census office was informed about the exact dates for carrying out interviews in different areas to help prevent any confusion the study might create considering the implementation of the 1976 census about a month later.

In Swaziland it is of special importance to have the approval of the local chief before indulging in an endeavor such as data collection. Without his sanction his subjects will not participate. On the other hand, if the right procedure has been

followed and the chief has given his approval, almost any information can be asked for.

In Velezizweni, where University staff were already well-known, and a brother of the chief was engaged as a part-time enumerator and interpreter, and the fact that the author had visited the area several times during the previous year, some short-cuts could be taken. No meeting needed to be held at the chief's kraal; introduction by his brother of the enumerators to individual families was considered to be enough. It was important, however, that the first interviews had been held at the chief's kraal. His senior wife was interviewed and some additional household members. Unfortunately the chief, himself, was away during the time for data collection in Velezizweni.

In Luyengo, in the same manner, an elder, appointed by the chief and employed as an agricultural laborer, accompanied the enumerators. This was particularly important in Luyengo, since resentment towards the University still lingered. Already, at the meeting with the chief a year earlier, the old man was appointed for this special task. During regular meetings with elders in the Luyengo chieftainship, the chief also informed others about the planned study.

The situation in Bhunya, not a traditional chieftainship, was different. After approval by the company and the town clerk, a notice was placed in the weekly local newspaper of Bhunya, explaining the purpose of the study and asking for the people's

cooperation. The enumerators were apprehensive at the beginning about interviewing people in this community, but only one refusal was recorded.

In all three areas a male and female enumerator approached the families together and, if possible, individually interviewed husband and wife. The male enumerator interviewed the man, while the female enumerator interviewed the woman. If only one of them was at home he/she was interviewed if this was convenient, and an appointment was made with the other partner for a later occasion. However, the most common procedure was that appointments were made with everyone a day in advance. It was surprisingly easy to carry out interviews without either spouse or other household members standing around.

The Enumerators

The enumerators were four female students enrolled in the Home Economics Diploma Course, and three male students, one enrolled in the General Agriculture Diploma Course and two in the Animal Health Course at the University, Luyengo campus. All had completed their first year of training. The male students were specially employed by the home economics department, while the data gathering experience was considered as part of the required "extension practicals" for the female students. In Velezizweni, after the data gathering period, they also carried out food and nutrition demonstrations. This was planned to take place in all the three research areas, but due to unexpected circumstances it could not be

implemented in Luyengo and Bhunya in connection with the actual data gathering period.

Training of Enumerators

A week was allocated for the training of the enumerators before the field work in order for them to be well informed about the overall objectives of the study, to be familiar with the lengthy and, in their opinion, difficult questionnaires, and to practice skills in interviewing. The female students had previously been involved in the development of the questionnaires and were familiar with the study. They had also completed a course in basic research methods with the focus on family studies. The introduction as well as transitional and explanatory statements before each new section of the questionnaires were also worked out together with the students during this period.

Field Work

During the field work an excellent team spirit developed among the students. Their attitudes towards their work, the families they interviewed, and other people contacted were the best possible. In brief, they were eager, cooperative, and sensitive.

A general observation was that a lot of learning took place during this period. Contributing to this ideal situation were also the two drivers who were in charge of the four-wheel drive vehicle used throughout this period. Usually, after a reporting and planning session in the morning, the team stayed out in the field the whole day having brought packed lunches. In Luyengo and Bhunya,

interviewing also took place in the evenings, the only possible time to meet some of the wage earners. The headquarters for the team was the Luyengo campus.

Method of Analysis

The purpose of the investigation was to find the effect of such factors as sex, age, number of children, and environment on the dependent variables covered in the study. The statistical analysis used provides:

a. Unbiased estimates of the effects of each level of each factor.

b. Significance tests such that the

   i. null hypothesis that effects of the various levels of a factor are zero can be either accepted or rejected at some satisfactory level of probability.

   ii. null hypothesis that the difference between any two levels of a factor can be accepted or rejected.

In this study the method of least squares was used to make unbiased estimates of the factor effects. This procedure is required because of the occurrence of unequal subclass numbers which result in confounded estimates of the effects if simple cross-classification is used to analyze the data. Least squares analysis also provides mean squares which through the analysis of variance give estimates of the variance components associated with each source of variation which makes it possible to apply the F-test of significance and Duncan's least significant range test.

Model

The theoretical model underlying the data, for the case of two sources of variance affecting one dependent variable, is given below as an example of the statistical method of analysis.

$$(1)\ Y_{ijk} = \mu + P_i + A_j + (PA)_{ij} + \varepsilon_{ijk}$$

where Y_{ijk} is the value of the dependent variable of the k^{th} respondent in the i^{th} level of independent variable 1 and belonging to the j^{th} level of independent variable 2; μ is the population mean; P_i is the effect of the i^{th} level of independent variable 1; A_j is the effect of the j^{th} level of the independent variable 2; and $(PA)_{ij}$ is the effect of the interaction between the independent variables.

ε_{ijk} is a random error term associated with the response of the k^{th} respondent in the i^{th} level of independent variable 1 and belonging to the j^{th} level of the independent variable 2. ε_{ijk} is assumed to be normally distributed with a mean of zero and a standard deviation of σ. The variance is assumed to be homogenous.

The model also assumes that the effects are additive and that

$$\sum P_i = \sum A_j + \sum_i (PA)_{ij} \quad \text{for all } j = \sum_j (PA)_{ij} \quad \text{for all } i = 0$$

In this investigation the subclass numbers are unequal, that is, n_{ij} in each cell are not equal.

While the estimate of the effects (A_1, A_2, . . . , P_1 . . .) is straightforward with equal subclass numbers, this procedure gives biased estimates if applied to cross-classified models with unequal

subclass sizes. Statistical methods using the principle of least squares have been evolved by Kempthorne (1952), Cunningham and Henderson (1968), and Harvey (1960). A version of Harvey's method was available in Fortran code at the Ministry of Agriculture, Mbabane. Hence, it was possible to use Harvey's routine to make estimates of the factor effects and to apply significance tests. A limitation of the program was that cell means were not provided, only deviations from the grand mean. This shortcoming made it impossible to interpret interaction effects.

In this study a .01 alpha level was chosen. Repeated analyses, which is less than ideal, necessitated this level. Results of these analysis of variance tests are reported in Appendix D.

Duncan Multiple-Range Test

In order to test which of the means differed significantly, Duncan's multiple-range test was applied (Harter, 1960).* Essentially all possible hypotheses of the type $\mu_1 - \mu_2 = 0$ at a specified significance level are tested. In this study the .05 level was chosen.

To be significantly different the range of any subset of sample means must exceed a certain value. This value is called the least significant range (R_p) for the (p) means, assuming that

*While Duncan's test is strictly applicable to situations where the number of replications within each class are equal, in most classes in the study the numbers were spread fairly evenly between classes so that Duncan's test seemed appropriate.

(k) random samples are all of equal size (n). R_p is computed through the following formula:

$$R_p = r_m\sqrt{s^2/n}$$

where s^2 is the sample variance obtained from the error mean square in the analysis of variance table, and r_m is least significant studentized range depending on desired level of significance and the number of degrees of freedom of the error mean square. The r_m is obtained from Duncan's tables and n is the total number of observations divided by the number of classes.

After arranging the sample means in increasing order of magnitude, comparisons can be made between the least significant ranges (R_m) and the differences in the ordered means. An absolute value greater than R_m indicates significant differences. In Tables 16-27 this is indicated by letters assigned to means such that those sharing a common letter are not significantly different from one another.

CHAPTER IV

DESCRIPTION OF RESEARCH AREAS AND SAMPLE

This chapter will cover selected background information of Swaziland and a description of research areas, sample, and characteristics of the sample.

Swaziland: Background Information

Swaziland is one of the smallest countries in Africa and is situated in southeastern Africa between the Republic of South Africa and Mozambique, without any direct access to the sea. The country is divided into four clearly distinguishable climatic and geographic zones, extending longitudinally from north to south. Of highest elevation is the "Highveld" region, where two of the research areas in this study (Velezizewni and Bhunya) are located. Characteristics of the zone are steep, rocky hills, which in some areas are rich in mineral resources. Subsistence farming predominates, with maize as the most important crop, while afforestation projects have been developed on a commercial scale. The "Middleveld," where the third research area (Luyengo) is located, extends to the east of the "Highveld." This area has rolling topography, with tall grassland and good cultivatable soils. It has always been the most heavily populated region of Swaziland, and is where the influence of Western civilization has been the strongest, resulting in a higher degree

of industrialization and urbanization than in other parts of the country.

In contrast to many African nations, Swaziland is fortunate to be ethnically homogenous. The Dlamini clan, who form the nucleus of the Swazi Nation, is a Bantu speaking group mainly Nguni in language and customs (Schapera, 1966: 45-47). They settled in the country at the end of the eighteenth century. The last thirty years of the nineteenth century were marked by permanent European settlements and their economic conquest of the country. Boers sought new farming land and better grazing for their sheep, while Britons mainly engaged in mining and the establishment of business. This was a tragic period of Swazi history with an intensive economic and cultural power struggle between Europeans and Swazis, which resulted in the loss of Swazi political independence. The country was for a short period administered from the Transvaal Republic, but the British government gained control of the territory in 1902 after a victory in the Anglo-Boer War. In 1968 Swaziland gained total national independence and became a constitutional monarchy.

Swaziland is comparatively rich in natural resources, and has experienced a more rapid rate of economic development than most African countries. Nevertheless, economic development is a localized phenomenon in Swaziland and it is relevant to refer, as Fair, Murdoch and Jones (1969) do, to "Islands of Development." Traditional subsistence economy is still existing side-by-side with modern money economy. Swaziland's economy is heavily dependent on

the economy of the Republic of South Africa. Migration of labor from Swaziland is still a common phenomenon and the two nations form together with Botswana and Lesotho a customs union.

The Swaziland government faced the usual challenges of developing countries in transforming their country to a modern nation. A rapid expansion of the formal educational system has taken place in Swaziland since independence. In 1972, 50 percent of young people aged 5-19 were attending school (Second National Development Plan, 1973-1977: 151). Education is not free in Swaziland but subsidized by the government and to a great extent by religious and private organizations.

On the average the Swazis are healthier than many other people in developing countries, partly because many tropical diseases are not endemic and partly because of the fast expansion of curative and preventive services. Infant mortality is, however, still high.

The main approach of family planning services has been to integrate family planning into public health services; into the regular maternal health program. All governmental health centers offer family planning services daily, while at the rural clinics services are more irregular depending on the training of personnel and time available. The Pill and the IUD are the most common devices, and at rural clinics given free of charge. Before women are given contraceptives they must present a signed form of approval by their husbands or, in case of an unmarried woman, by the father. It is not

usually a policy to extend family planning services to young unmarried women who have not yet had a child.

Agricultural and home economics extension programs are carried out by the Ministry of Agriculture. Agricultural extension started in the 1940s and has been of moderate success. To make programs more effective, extension efforts have been concentrated on pilot areas and on key programs. Approximately five percent of rural women participate regularly in home economics extension programs. The home economics extension agents, "domestic science demonstrators," work through women's associations, known as the Zenzele groups, originally developed for this purpose in the early 1950s. The major components of the home economics extension program are food and nutrition education, family life education, child development, home gardening, budgeting and handicraft ("Programmes Related to Family Living in Swaziland: A Handbook," Luyengo, April 1967: 53).

Research Areas

Three areas of diversified environmental characteristics were selected for the implementation of the study. The three selected areas were Velezizweni, Luyengo and Bhunya. They span from one extreme to the other of development stages existing in Swaziland at the time of the study. Velezizweni represents areas of a high degree of traditional social and subsistence economic characteristics, while Bhunya represents the other extreme of a high degree of

Westernized life style and money economy. Luyengo is assumed to fall in between the two extremes.

Velezizweni

Velezizweni is located in the Highveld region in Manzini District, approximately 10 km southeast of the town of Mankayane (see map, Appendix C). The area is accessible all the year round by gravel road from both Mankayane and Luyengo. Twenty-three households in a small valley, bounded by hills and the Mankayane-Luyengo road, were, since 1974, already involved in research carried out by the Faculty of Agriculture, UBS (Rose, 1975). A good rapport had been established with the farm families, which provided an ideal situation for the planned study, which would cover very personal areas of family life. The households are scattered, following the usual pattern in rural areas in Swaziland.

Velezizweni is located in a setting typical for that of the Highveld region. The views over the hills and gorges are breathtaking. The climate during the winter months is sunny and dry with cold nights, while there are heavy rains during the summer months. Even during the winter, however, there is seldom a shortage of water for household consumption. Natural creeks and springs usually provide enough water for livestock and irrigation projects.

The soil in Velezizweni is rocky and acid. The predominating crop is white maize, but various legumes, sorghum and cotton are also grown. As is the case regarding most traditional Swazi Nation land, the farmland in Velezizweni is fragmented. Most

farmers cultivate "lands" close to the homestead, but also in other places further away.

The majority of families in Velezizweni claim that they do not normally purchase maize. Gifts of maize, however, seem important between related families. A credit system in maize also seems to exist in such a way that households not producing sufficient maize to meet their needs over a particular season borrow from another farm. They are expected to pay back the following season.

During the 1973/1974 season, 8 of the 23 families in the valley sold maize to local traders immedately after the crop was shelled (Rose, 1975).

Vegetables from the irrigated, communally run garden situated five km away, as well as handicrafts such as grass mats, baskets, crocheted items and beadwork are marketed in Mankayane or Manzini. These products are usually transported by the regular passenger bus service.

Cattle breeding is an integral part of the economic system of Velezizweni. Each family owns on the average about 18 head of cattle. Besides giving the owner prestige, cattle are easily converted into cash when a need arises. Many families also keep goats and pigs, chiefly for household consumption. Poultry is kept in almost every kraal.*

Velezizweni is governed by a Chief of the Dlamini clan, who is appointed by the King following the traditional pattern. His

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*Kraal means compound and is often used synonymously with homestead.

kraal stands out from the rest of the kraals in the area, comprising many individual huts. It is the natural meeting place for meetings of different kinds. His subjects are expected to pay tax to him and participate in work parties on his land or in his household. Several of the families living in Velezizweni are related to the Chief. He has four wives and many children.

Most families in Velezizweni are, however, monogamous. Except for the Chief's household, only three other husband/wife couples were polygamous. On the other hand, six of the women interviewed, not living with their husbands, claimed that they were either senior or junior wives.

The size of families in Velezizweni varies from very small, consisting of single women and their children, to very large with many members additional to the immediate family. In many cases the husband is not present and works as a wage earner in towns in Swaziland or abroad, coming home only to visit. In a few cases the opposite situation exists, where the wife is working elsewhere, often as a teacher or nurse, while the husband is staying in the rural home.

A common family situation in Velezizweni is also that the mother of the head of the household, usually widowed, lives together with younger brothers and sisters of the head of the household, and grandchildren, while the head of the household is living with his immediate family in another place.

At the time of the study, farming activities were low in Velezizweni. The farming season was over and little else but dry

grass could be seen around the farms. Some farmers and their wives were involved in preparations for agriculture and home economics shows, respectively--shows taking place during this time of year. It is also the time for repairing and building new houses. Women spend much time cutting thatching grass on the veld and men are repairing the roofs. Beer parties take place on a rotating basis all the year round, and are well attended.

There are two primary schools in Velezizweni--Velezizweni Primary School and South African General Mission (SAGM) Primary School, both supervised and run by the Swazi government. The SAGM also arranges Sunday School teaching in three places in Velezizweni every Sunday. The nearest junior high school is located at Naqbaneni, about 20 km towards Luyengo, while a senior high school is located in Mankayane town, 10 km away. Literary classes are also conducted in the Mankayane area.

There are four churches in Velezizweni--Zionist, Methodist, Apostolic, and Roman Catholic. The nearest medical facility is the hospital in Mankayane. There are, however, two "African Doctors" in the area itself, one of whom is a woman.

The Agricultural Extension Field Officer lives in the area. Several farmers have frequent contacts with him, resulting in the adoption of improved farming practices. The Domestic Science Demonstrator assigned to Velezizweni lives in Mankayane, and carries out extension activities in the area, but on a less regular basis.

A small grocery store is located in the area, but carries a very limited assortment of goods.

Luyengo

The majority of the families interviewed in Luyengo live next to the southwest border of the campus of the Agricultural College at the University of Botswana and Swaziland. The college is situated 37 km southeast of Mbabane and 28 km west of Manzini. Before the establishment of the college in 1966, these families were living on the campus grounds. When the King donated the land to the establishment of the college they were moved to the present settlement. For many families this was the second forced move in a generation, and the decision caused much rebellion and resentment.

The main source of income for these families previously was from breeding cattle. Since the 12 acres of land allotted to each when moved could not support the number of cattle they owned, it was stipulated that they had to limit the number of cattle to five. It was suggested these cattle should be dairy cows, and milk could thus be sold to the college community, providing families with a new source of cash income. However, soon the college obtained their own dairy herd, producing sufficient milk to supply the college community.

As a compensation for these sacrifices, housing of improved standard was provided, water supply in terms of an irrigation channel was made available, and a cash lump sum was paid to each family. Expert advice and equipment from the college were further made available and utilized in developing the new settlement. Nevertheless, the relationship between the people and college continued to be tense, and extension efforts from the college ceased. However,

over time the situation has normalized, and at the time of this study people were found to be generally content with their situation. Several men and women are now employed by the college or private families in the college community.

No hostility was experienced by the enumerators and people were cooperative in providing the information which was asked for. This was doubtless due partly to the presence of the elder appointed by the Chief to accompany the enumerators.

The settlement consists of two main groupings of houses: one to the south of a creek which, at the western end of the settlement joins the Usutu River, and the other is situated alongside the Luyengo-Mankayane road between the point where the main Bhunya-Manzini road and the Usutu River join. No interviews in the final study were carried out in the former area since the instruments were tested among some of those families.

The Luyengo area is located in the Malkerns Valley in the Middleveld region at an altitude of 750 meters, with a climate that could be described as ideal. An outstanding feature of this area is the vast pineapple plantations expanding over the land. The valley is surrounded by semi-mountains, which in the north are covered by a man-made pine forest. The area is doubtless one of the most attractive in Swaziland.

The area is part of one of the "corridors of development" in Swaziland, stretching from Manzini to Bhunya. The most obvious factor that has contributed to the high degree of development is the irrgation system which was built and developed from the Usutu

River during the early 1950s. At that time fruit farming, consisting mainly of pineapple and citrus, was started by white settlers--many of Brisih origin--on freehold land. A fruit cannery was also established in the Malkerns village, five km northeast of Luyengo. Production mainly consists of pineapple and citrus which are processed for export. Approximately 3,000 workers are employed in the factory and on the plantations.

An Agricultural Research Station is also located in the area--it is associated with the College, employing about 120 people in Luyengo. During agricultural seasons there is a shortage of labor in the area. Labor is then transported to the Valley from areas further away. The majority of agricultural and factory workers are women.

The nearness of the University, commercial activities, and tarred road with fast and frequent bus services to Manzini and Mbabane place Luyengo somewhere in the middle of an urban-rural continuum. The area has many features in common with Velezizweni, with the major part of the population still involved in farming activities, but more on a part-time basis, with one or more family members earning wages in the neighborhood.

Most families cultivate maize, and vegetables such as cabbage, tomatoes and onions. The maize is usually consumed in the household, while vegetables are also sold. Transporting vegetables to markets is, however, difficult, and often products are spoiled in the field. Other sources of cash income are sales of handicraft products and home-brewed beer.

The houses provided by the government are of similar design --commonly, two bedrooms, living-room and kitchen. Walls are made of cement blocks and roofs of corrugated iron. Some of the houses have been extended, while, in addition, other types of houses such as the traditional rural hut and typical square-shaped urban house have been built. Water is fetched from the irrigation ditches or the river. There is no electricity in the settlement.

Similar to Velezizweni, many families are split in Luyengo. A large number of homes are occupied by single women, widowed or with husbands living in other places. Monogamous family structure predominates. Only four of the couples contacted lived in polygamous unions.

There is one primary school, one junior high school, and one secondary school in Luyengo--the latter only for boys. In spite of the fact that the area is better provided with educational facilities than most other semi-rural areas, there is keen competition for places in the schools.

There is one Zionist and one Anglican church in the near neighborhood of Luyengo.

Towards the northern part of the settlement there is a large store run by Indians, carrying groceries, fabrics, clothes, shoes, and household equipment. A butchery and petrol station are also run in conjunction with the store, as well as an outdoor vegetable market. Warm local food and drinks are also sold at the vegetable market. Opposite, on the road, a "Beer Hall" has recently been

established, and further along the main Bhunya-Manzini road there are two smaller grocery stores.

The main bus stop is located where the Mankayne road joins the Bhunya-Manzini road. People are seen there waiting for or exchanging buses throughout the day. Buses also stop in front of the Indian store and along the road towards the river.

A Government Health Clinic is situated a short distance from the settlement. The charge is 30c per consultation. A maternal and child health program is carried out, as well as family planning services.

An Agricultural Extension Field Officer and a Domestic Science Demonstrator live in the settlement, but since they both have a wide area to cover, extension activities have not been intensive in the settlement. Only recently, a "Women's Club" was started in connection with the United Nations "Women's International Year."

Bhunya

The community of Bhunya is located in the middle of the Usutu Forest--one of the largest man-made pine forests in the world. The distance from Luyengo is 21 km in a northwest direction. The climatic conditions of this Highveld region provided ideal conditions for a gigantic afforestation project. In 1949 the planting of pine trees started on the 100,000 acres which the forest now covers. The rolling hills, previously not very productive, now produce trees ideal for pulping in a 10-20 year cycle. In 1959, a

pulp mill was established at Bhunya, with a capacity of producing 100,000 tons of unbleached kraft pulp per year for export.

The creation of the community of Bhunya is directly linked to this industry. Housing for the employees had to be provided. Bhunya was planned for unskilled and semi-skilled workers, while another community living at Mhlambanyati, a village 15 km away, was established for employees in higher income brackets. The Usutu Pulp Company, Ltd., employed in 1976 approximately 2,500 people, of whom 529 are living in Bhunya. With dependents, the population of Bhunya comprises approximately 1,500 people. Bhunya is an all-black community, while the proportion of black to white inhabitants in Mhlambanyati is one to nine. About five percent of the employees are women in Bhunya.

The streets in Bhunya are all connected to a big, open, circular grassed area in the center of the village. A large general store, butchery and post office are located in the northern part of the open place. In this area are the bus station, the market, where vegetables and hot prepared food are on sale, a restaurant, the social worker's office, and the town clerk's office. Further to the north and downhill are the stadium, sports fields, tennis courts, the community hall and the club. There are seven churches in Bhunya --all located in the western part of the village. A large primary school and a junior secondary school are the main educational facilities.

Houses are of one-family or semi-detached type, with internal or external ablution facilities. The smallest unit

consists of two bedrooms and kitchen, while other units have a living room, also. In a recently built extension of Bhunya--New Bhunya--located in the eastern part of the community, all houses are of one-family type, with three bedrooms, living-room, kitchen and internal ablution facilities. Houses with four rooms and a central kitchen, designed for four single people, have also recently been built in the center of the village. Altogether there are 388 family and 140 single units. The rentals for units vary from E2-E8,* which is a subsidized rate.

Vegetables are often grown outside the houses--mainly cabbage, onions and carrots. A nursery, privately owned, sells plants to families. There is also a Poultry Association run as a cooperative, to which the company has allocated land.

Most inhabitants in Bhunya consider their stay as temporary, although the labor situation is close to being static. Almost everyone has a home somewhere else to which they will return when employment is terminated. Workers visit their homes over weekends and holidays, or the family will come to Bhunya to visit. Sometimes the wife and children return to the permanent home after an initial stay in Bhunya, and sometimes a worker brings a part of his family--for example, one wife and her children, or maybe only one child for the purpose of keeping him company and attending school--while the rest of the family stays in another place. Nevertheless, the majority of inhabitants in Bhunya seem to live in what, with caution, could be called a nuclear family system.

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*In August 1976 one Emalangeni equaled 0.87 US dollars.

There is always money in cash around in Bhunya. The majority of employees living there are classified as laborer, unskilled and semi-skilled, and are paid hourly with an income per month ranging from E53-E80. Artisans, chargehands, supervisors, laboratory technicians, and chemical process operators are usually paid weekly, earning on an average E150-E450 per month, while chargehands, supervisors and administrative staff are paid monthly, with salaries ranging from E1,000-E3,000 per year.

It is obvious that the relationship between productivity and the health status of the worker is recognized by the company. Free medical service is available at the company clinic for workers not earning over approximately E80 per month, which includes their dependents. At higher income levels, workers are eligible to join a health insurance scheme at a cost of E4 per month, with a coverage of 80 percent of health expenses--also for treatment in other places than Bhunya. The health care system is nevertheless highly subsidized by the company.

There is no family planning program, as such, implemented by the Clinic, although family planning services are available. The Pill is the main means of contraception. The Clinic charges the wholesale price plus a five percent margin which comes to 60c per cycle. The justification for not distributing the Pill free of charge is that women not being able to afford the charge can be referred to the Government Clinic just outside Bhunya. From a rough estimate taken from purchase orders at the company clinic covering the previous year, about 25 percent of women in Bhunya are on the

Pill. No approval from husbands, unlike at governmental clinics, is asked for. A pre- and post-natal program is carried out by staff at the clinic. Most pregnant women living permanently in Bhunya are believed to be reached through this program.

A well-qualified social worker is employed by the company, mainly to work with families living in villages in the forest. She, however, also leads a women's group in Bhunya, having on their program nutrition, food preservation, health, child care, handicrafts, and a saving scheme. Every afternoon she also welcomes a playgroup of children 13-16 years of age to her office/demonstration center. Women in Bhunya are also involved in the Red Cross Society and in the Zondle School Feeding Scheme.

Sport and music are important leisure-time activities in Bhunya. Tournaments of soccer between teams of workers from different departments at the mill, or between Bhunya teams and teams coming from outside, are common weekend activities. Competitions between groups of singers are also organized. The club is run entirely by the community. Films are shown there regularly, and other activities such as darts, and table-tennis, take place there. Much social activity is associated with the churches. Generally, church attendance is high in Bhunya.

Sample

In order to obtain an adequate sample size for the analysis, the criterion was set that at least 50 interviews from at least 30 different households should be carried out in each of the three

research areas. For the same reason, in at least 15 households in each area both husband and wife should be interviewed. In Velezizweni and Luyengo the total population within determined boundaries and some additional households were interviewed, while a random sample was drawn from the total population in Bhunya.

In Velezizweni the 23 households in the valley and 7 additional on the opposite side of the road were contacted. In Luyengo the total population of 27 households alongside the Luyengo-Mankayane road and 9 additional families north of the Bhunya-Manzini road, close to the junction with the Luyengo-Mankayane road were added. The latter area is named Mhlabubovu and has very similar characteristics to the settlement area.

From the total population of Bhunya, excluding single people without children (according to the records in the town clerk's office), 40 households were selected at random with the help of records from the town clerk's office, and a random table. Of these, one family was on leave, two refused to be interviewed, and in six no one was at home in spite of repeated calls, leaving the number of contacted households at 31. The total number of people interviewed was 54.

All in all, 169 men and women were interviewed: 52 in Velezizweni, 63 in Luyengo and 54 in Bhunya. Table 2 presents a summary of contacted males, females and couples in the three areas.

TABLE 2.--Respondents: Females, Males, and Couples by Area.

Area	Females		Males		Subtotal		Matched Couples	% of Subtotal
	#	%	#	%	#	%		
Velezizweni	31	18	21	12	52	30	15	28
Luyengo	39	23	24	14	63	37	15	28
Bhunya	26	17	28	16	54	31	22	42
Total	96	57	73	43	169	100	52	100

Characteristics of the Sample

Characteristics of the sample are presented in the tables below.

Ages of respondents were distributed by areas as shown in Table 3.

TABLE 3.--Age Distribution by Area.

Area	Age Group						Subtotal
	20-30		31-45		46+		
	#	%	#	%	#	%	
Velezizweni	5	10	25	48	22	42	52
Luyengo	8	13	23	36	32	51	63
Bhunya	25	46	26	48	3	6	54
Total	38	22	74	44	57	34	169

There was a bias towards older ages in the Velezizweni and Luyengo subsamples, while there was a bias towards younger ages in the Bhunya subsample.

In analyses using only female and male respondents, ages were classified into two groups; the age distributions are shown in Tables 4 and 5. Generally, men in the sample were older than women.

TABLE 4.--Age Distribution of Females by Area.

Area	Age Group				Subtotal	
	20-35		36+			
	#	%	#	%	#	%
Velezizweni	12	39	19	61	31	32
Luyengo	14	36	25	64	39	41
Bhunya	20	77	6	23	26	27
Total	46	48	50	52	96	100

TABLE 5.--Age Distribution of Males by Area.

Area	Age Group				Subtotal	
	20-35		36+			
	#	%	#	%	#	%
Velezizweni	2	10	19	90	21	29
Luyengo	5	21	19	79	24	33
Bhunya	13	46	15	54	28	38
Total	20	27	53	73	73	100

The educational levels of respondents are shown in Table 6. The educational attainments were considerably higher in Bhunya than Velezizweni. More women than men had terminated with primary and lower secondary school, while men outnumbered women in higher secondary school attendance.

The respondents' affiliation with religious denominations is shown in Table 7 (page 60).

Table 8 (page 61) shows the number of women who reported they were legally married or not married. Although 21 women reported that they were not married, most women in the study lived in a marriage-like union.

The status of the legally married women is shown in Table 9 (page 61). From those figures, it is evident that a monogamous family structure prevails in the sample. Thirty-six percent of women in Velezizweni and 12 percent of women in Luyengo do, however, live in a polygamous situation.

Women reported presence and absence of husband as shown in Table 10 (page 62). Husband refers both to legal and nonlegal partners. That 100 percent of the husbands in Bhunya were present is, of course, related to the fact that the family would not live in Bhunya if the husband was not present and employed by the company.

The marital status of men, distributed by areas, is shown in Table 11 (page 62).

TABLE 6.--Highest Level of Education Antained by Sex and Area.

Area	None			Literacy			Primary			Lower Secondary			Higher Secondary			Sub-total
	F	M	Sub	F	M	Sub	F	M	Sub	F	M	Sub	F	M	Sub	
Velezizweni																
Number	15	7	22	4	5	9	12	18	20	1	--	1	--	--	--	52
% of Subtotal	29	13	42	8	10	18	23	15	38	2	--	2	--	--	--	
Luyengo																
Number	10	11	21	3	7	10	21	5	26	4	1	5	--	1	1	63
% of Subtotal	16	12	33	5	11	16	33	8	41	6	2	8	--	2	2	
Bhunya																
Number	2	3	5	1	1	2	13	10	23	9	8	17	1	6	7	54
% of Subtotal	3	6	9	2	2	4	24	19	43	16	15	31	21	11	13	
Total																
Number	27	21	48	8	13	21	46	23	69	14	9	23	1	7	8	169
%	16	12	28	5	7	12	27	14	41	8.5	5.5	14	0.6	4	5	

F = Female; M = male; Sub = Subtotal.

TABLE 7.--Religion by Area.

Area	Religious Groups*												Sub-total
	A		B		C		D		E		F		
	#	%	#	%	#	%	#	%	#	%	#	%	
Velezizweni	21	42	6	12	--	--	20	38	--	--	4	8	52
Luyengo	19	30	13	21	2	3	17	27	12	19	--	--	63
Bhunya	19	35	6	11	13	24	11	20	3	6	2	4	54
Total	60	35	25	15	15	9	48	28	15	9	6	4	169

A = Apostolic, South African General Mission, Swazi National, Nazarene, Swedish Lutheran.
B = Anglican, Roman Catholic.
C = Methodist, Baptist.
D = Zionist.
E = Jehovah's Witness, others.
F = None.

*The denominations were grouped according to similarities in religious doctrine.

TABLE 8.--Marital Status of Women by Area.

Area	Married		Not Married		Sub-total
	#	%	#	%	
Velezizweni	22	70	9	30	31
Luyengo	33	85	6	15	39
Bhunya	20	77	6	23	26
Total	75	78	21	22	96

TABLE 9.--Marital Status of Married Women by Area.

Area	Senior Wife		Junior Wife		Only Wife		Other		Sub-total
	#	%	#	%	#	%	#	%	
Velezizweni	3	14	5	23	13	59	1	4	22
Luyengo	3	9	1	3	29	88	--	--	33
Bhunya	--	--	--	--	20	100	--	--	20
Total	6	8	6	8	62	83	1	1	75

TABLE 10.--Husband Present/Not Present by Area.

Area	Present		Not Present		Sub-total
	#	%	#	%	
Velezizweni	25	81	6	19	31
Luyengo	30	77	9	23	39
Bhunya	26	100	--	--	26
Total	81	84	15	16	96

TABLE 11.--Marital Status of Men by Area.

Area	Married		Not Married		Sub-total
	#	%	#	%	
Velezizweni	17	81	4	19	21
Luyengo	18	75	6	25	24
Bhunya	27	96	1	4	28
Total	62	85	11	15	73

Men reported number of wives by the three areas as shown in Table 12. Wife refers both to legal and nonlegal partners.

TABLE 12.--Number of Wives by Area.

Area	Number of Wives								Sub-total
	1		2		3		4		
	#	%	#	%	#	%	#	%	
Velezizweni	13	76	3	18	1	6	--	--	17
Luyengo	12	66	4	22	1	6	1	6	18
Bhunya	25	93	2	7	--	--	--	--	27
Total	50	81	9	14	2	3	1	2	62

Comparing the figures of reported status of married women in Table 9 and the figures of marital status of men in Table 12, some disparities are noticeable in the Bhunya subsample. It might be explained by the fact that women have referred to "only wife in Bhunya."

Presented in Table 13 is the actual number of children reported by men and women in the three areas.

TABLE 13.--Number of Children by Area.

Area	Number of Children						Sub-total
	0-2		3-5		6+		
	#	%	#	%	#	%	
Velezizweni	3	6	13	25	36	69	52
Luyengo	9	14	27	43	27	43	63
Bhunya	16	30	31	57	7	13	54
Total	28	17	71	42	70	41	169

A greater number of children is predominant in Velezizweni where, however, keeping the age bias of the sample in mind, a greater number of families can be assumed to be completed.

The mean number of people in households in the three areas is shown in Table 14.

TABLE 14.--Mean Number of People in Households by Area.

Area	Mean Number in Households
Velezizweni	7.93
Luyengo	8.16
Bhunya	6.13
Grand mean	7.41

In spite of a greater number of children reported from Velezizweni, the household size was greater in Luyengo.

CHAPTER V

FINDINGS

In this chapter, the results of the testing of the hypotheses using Harvey's least squares analysis and Duncan's multiple range test are reported. A summary of F-ratios for tested relationships is presented in Tables 15 and 16, followed by sections for each set of hypotheses referring to respective source of variance: sex, age, desired number of children, and environment. In each of these sections, a summary table of mean deviations is included. The chapter ends with a general summary.

In Tables 15 and 16 the F-ratios are summarized for tested relationships and interaction between sources of variance included in the particular analysis.

Sex As a Source of Variance

The total sample was used to test the hypotheses:

H_0 1: There is no effect of sex on (a) desired number of children, (b) ideal number of children, (c) attitude about fertility control, and (d) knowledge of reproduction.

The null hypotheses 1:c and 1:d were rejected. The magnitude of the F-statistic (see Tables 15 and 16) suggested that there was an effect of sex on attitudes about fertility control and the knowledge about reproduction. Women scored a higher population attitude score than men. The figures were 9.57 and 8.21,

TABLE 15.--Summary of F-Ratios from Least Squares Analyses with Sex, Age, and Environment as Sources of Variance.

Dependent Variable	N	Source of Variance			
		Sex	Age	Environment	Interaction
Desired number of children	169	2.1815	0.2482	4.4687*	1.0259
Ideal number of children	169	0.9190	0.1916	3.1766	0.6669
Population attitude score	169	10.6317*	0.8205	6.8704*	0.4584
Reproduction score	169	10.3269*	0.0650	2.6855	4.4380*
Hygiene score	96		3.3655	5.0178*	2.8817
Child care score	96		0.1683	0.1031	1.9317
Nutrition score	96		0.1445	2.7515	0.1907
Farm practice score	73		0.1414	5.5805*	0.0419
Utilization score	73		2.5268	3.7544	0.8804
Income	73		2.7287	13.7968*	0.3164

*Indicates significance at .01 level.

TABLE 16.--Summary of F-Ratios from Least Squares Analyses with Sex, Desired Number of Children, and Environment as Sources of Variance.

Dependent Variable	N	Source of Variance			
		Sex	No. of Children	Environment	Interaction
Desired number of children	169	3.3004	1.1171	4.0362	1.1328
Ideal number of children	169	1.3932	0.0006	3.1064	0.6393
Population attitude score	169	15.4827*	1.5230	13.4309*	0.9087
Reproduction biology score	169	11.3147*	1.9155	1.6739	0.4871
Couple resourcefulness score	52		0.3173	1.6264	0.2564
Couple population attitude score	52		0.3243	6.2760*	0.2088

*Indicates significance at .01 level.

respectively. Also, the reproduction score was higher for women than men. The means obtained were 2.98 and 2.50, respectively.

TABLE 17.--Summary of Mean Deviations Based on Sex, for Desired Number of Children, Ideal Number of Children, Population Attitude Score, and Reproduction Score.

Dependent Variable	Grand Mean	Sex	
		Females	Males
Desired number of children	6.32	-0.47	0.47
Ideal number of children	6.80	-0.68	0.68
Population attitude score* (max. 14)	8.89	0.68^{a}	-0.68^{b}
Reproduction score* (max. 7)	2.74	0.24^{a}	-0.24^{b}

*Refers to significance on .01 level.

^{a,b}The levels bearing "a" are significantly different from levels bearing "b."

Age As a Source of Variance

Hypotheses 2, 3, 4 and 5 tested the effect of age on all of the dependent variables in the study. Findings will be reported in relation to the hypotheses and based on the different sample sizes used in the analyses.

The total sample was used to test the hypotheses:

H_0 2: There is no effect of age on (a) desired number of children, (b) ideal number of children, (c) attitude about fertility control, and (d) knowledge of reproduction.

The null hypotheses were not rejected. The effect of age, based on three classes, was non-significant.

TABLE 18.--Summary of Mean Deviations Based on Age, for Desired Number of Children, Ideal Number of Children, Population Attitude Score, and Reproduction Information Score.

Dependent Variable	Grand Mean	Age Groups		
		20-35	31-45	46+
Desired number of children	6.32	0.38	0.15	0.24
Ideal number of children	6.80	-0.16	-0.41	0.57
Population attitude score (max. 14)	8.89	0.13	0.23	-0.36
Reproduction score (max. 7)	2.74	-0.02	0.03	0.00

A subsample of women in the study was used to test the hypotheses:

H_0 3: There is no effect of age of females on (a) knowledge of hygiene, (b) knowledge of child care, and (c) knowledge of nutrition.

The null hypotheses were not rejected. Age, based on two classes, did not have a significant effect on female level of information.

TABLE 19.--Summary of Mean Deviations Based on Age of Females on Hygiene Score, Child Care Score, and Nutrition Score.

Dependent Variable	Grand Mean	Age	
		20-35	36+
Hygiene score (max. 8)	4.16	0.30	-0.30
Child care score (max. 8)	5.31	0.05	-0.05
Nutrition score (max. 8)	3.37	-0.05	0.05

A subsample of males in the study was used to test the hypothesis:

H_0 4: There is no effect of age on males' farm practices.

The null hypothesis was not rejected. The age, based on two classes, did not have any effect on farm practices.

TABLE 20.--Summary of Mean Deviations Based on Age of Males on Farm Practice Score.

Dependent Variable	Grand Mean	Age	
		20-35	36+
Farm practice score (max. 10)	3.78	-0.15	0.15

For the effect of age on family use of community resources and family income, as reported by males, the following hypotheses were stated:

H_0 5: There is no effect of age on (a) family use of community resources and (b) income.

The null hypothesis was not rejected.

TABLE 21.--Summary of Mean Deviations Based on Age of Males on Family Utilization Score and Income.

Dependent Variable	Grand Mean	Age	
		20-35	36+
Utilization score	48.15	2.88	-2.88
Income	4.26	0.49	-0.49

Number of Children As a Source of Variance

Hypotheses 6 and 7 tested the effect of the actual number of children on fertility goals, standards, and attitudes about fertility control and resourcefulness.

The total sample was used to test the hypotheses.

H_0 6: There is no effect of actual number of children on (a) desired number of children, (b) ideal number of children, (c) attitudes about fertility control, and (d) knowledge of reproduction.

The null hypotheses were not rejected. The actual number of children, based on three classes, did not have any effect on the desired number of children, ideal number of children, attitudes about fertility control and knowledge of reproduction.

TABLE 22.--Summary of Mean Deviations Based on Actual Number of Children for Desired Number of Children, Ideal Number of Children, Population Attitude Score and Reproduction Score.

Dependent Variable	Grand Mean	Number of Children		
		0-2	3-5	> 6
Desired number of children	6.32	-0.64	-0.05	0.69
Ideal number of children	6.80	-0.03	0.02	0.00
Population attitude score	8.89	-0.48	-0.05	0.53
Reproduction score	2.74	0.10	-0.18	0.08

A subsample of matched couples was used to test the hypotheses:

H_0 7: There is no effect of actual number of children of couples on (a) resourcefulness and (b) attitudes about fertility control.

The null hypothesis was not rejected. There was no effect of actual number of children on couples' resourcefulness or attitudes about fertility control.

TABLE 23.--Summary of Mean Deviations Based on Actual Number of Children of Couples for Resourcefulness Score and Population Attitude Score.

Dependent Variable	Grand Mean	Number of Children	
		< 5	> 5
Resourcefulness score (max. 14)	23.70	-4.15	4.15
Population attitude score (max. 14)	7.71	-2.78	2.78

Environment As a Source of Variance

Hypotheses 8, 9, 10, 11 and 12 tested the effect of environment on all the dependent variables in the study.

The total sample was used to test the hypotheses:

H_0 8: There is no effect of environment on (a) desired number of children, (b) ideal number of children, (c) attitudes about fertility control, and (d) knowledge of reproduction.

Hypotheses 8:b and 8:d were not rejected.

The effect of environment on the desired number of children and attitudes about fertility control was, however, significant. In the rural area (environment) the mean number of desired children was 7.25, in the semi-rural area, 6.83, and in the urban area, 4.85. The means for the rural and urban area were significantly different from the semi-rural area. The population attitude score was highest for the urban area, followed by the rural and semi-rural areas. The means were 10.04, 8.55, and 8.08, respectively (Table 24).

TABLE 24.--Summary of Mean Deviations Based on Environment for Desired Number of Children, Ideal Number of Children, Population Attitude Score, and Reproduction Score.

Dependent Variable	Grand Mean	Environment		
		Rural (Velezizweni)	Semi-Rural (Luyengo)	Urban (Bhunya)
Desired number of children*	6.32	0.96[a]	0.51[a]	-1.47[b]
Ideal number of children	6.80	2.45[a]	-0.51[ab]	-1.93[b]
Population attitude score* (max. 14)	8.89	-0.34[a]	-0.81[a]	1.15[b]
Reproductive information score (max. 7)	2.74	0.23	-0.07	-0.16

*Refers to significance at .01 level.

a, b, ab Refer to Duncan's test. The levels sharing the same letter are not significantly different.

The female subsample was used to test the hypotheses:

H_0 9: There is no effect of environment on (a) knowledge of hygiene, (b) knowledge of child care, and (c) knowledge of nutrition.

Hypotheses 9:b and 9:c were not rejected.

However, the effect of environment on knowledge of hygiene was significant. The highest mean score, 4.64, was reported from the rural area, followed by the semi-rural area, 4.46, while the urban area had the lowest, 3.37. The mean score for the rural and semi-rural areas differed significantly from the urban area.

TABLE 25.--Summary of Mean Deviations Based on Environment for Hygiene Score, Child Care Score, and Nutrition Score.

Dependent Variable	Grand Mean	Environment		
		Rural (Velezizweni)	Semi-Rural (Luyengo)	Urban (Bhunya)
Hygiene score* (max. 8)	4.16	0.48[a]	0.30[a]	-0.79[b]
Child care score (max. 8)	5.30	-0.07	0.06	0.01
Nutrition score (max. 8)	3.37	-0.48	0.10	0.38

*Refers to significance at .01 level.

[a,b]Refer to Duncan's test. The levels sharing the same letter are not significantly different.

The male subsample was used to test the hypothesis:

H_0 10: There is no effect of environment on farm practices.

The null hypothesis was rejected.

Farm practices differed significantly between the three environments. The highest mean score, 5.35, was obtained in the rural area, followed by the semi-rural area, 3.57, and the urban area, 2.41. The semi-rural and urban area differed significantly from the rural area. (See Table 26.)

The male respondents were asked about the use of community resources by the family, and about the yearly family income to test the hypotheses:

H_0 11: There is no effect of environment on (a) use of community resources and (b) income.

The null hypothesis 11:a was not rejected.

TABLE 26.--Summary of Mean Deviations Based on Environment for Farm Practice Score.

Dependent Variable	Grand Mean	Environment		
		Rural (Velezizweni)	Semi-Rural (Luyengo)	Urban (Bhunya)
Farm practice score* (max. 10)	3.78	1.57[a]	-0.20[b]	-1.36[b]

*Refers to significance at .01 level.

[a,b]Refer to Duncan's test. The levels sharing the same letter are not significantly different.

Income, however, differed significantly between the three social and economic environments. The highest mean level of income was reported from the urban area, 6.16, followed by the semi-rural area, 3.45, and the rural area, 3.16. The mean levels from the rural and semi-rural area differed significantly from the mean level from the urban area.

In Emalengeni the mean yearly income reported fell in between 200-440 in the rural area and 10-49 in the semi-rural and rural area. A bias of under-reporting the income seems likely. (See Table 27.)

The sample of matched couples was used to test the hypotheses:

H_0 12: There is no effect of environment on couples' (a) resourcefulness and (b) attitudes about fertility control.

The null hypothesis 12:a was not rejected.

TABLE 27.--Summary of Mean Deviations Based on Environment for Utilization Score and Income.

Dependent Variable	Grand Mean	Environment		
		Rural (Velezizweni)	Semi-Rural (Luyengo)	Urban (Bhunya)
Utilization score	48.15	5.66	-0.42	-5.23
Income*	4.26	-1.09[a]	-0.80[a]	1.90[b]

*Refers to significance at .01 level.

[a,b]Refer to Duncan's test. The levels sharing the same letter are not significantly different.

The effect of environment on couples' attitudes about control fertility was, on the other hand, significant. The mean scores for the rural and semi-rural areas differed significantly from the urban area. The means were 6.40, 6.81, and 9.91, respectively.

TABLE 28.--Summary of Mean Deviations Based on Environment on Couples' Resourcefulness Score and Population Attitude Score.

Dependent Variable	Grand Mean	Environment		
		Rural (Velezizweni)	Semi-Rural (Luyengo)	Urban (Bhunya)
Resourcefulness score (max. 41)	23.70	0.93	1.40	1.21
Population attitude score* (max. 14)	7.71	-1.30[a]	-0.89[a]	2.20[b]

*Refers to significance at .01 level.

[a,b]Refer to Duncan's test. The levels sharing the same letter are not significantly different.

Summary

The effect of the environment was significant in a number of relationships tested in the study. The greater F-ratios were obtained for population attitude score and income, followed by farm practice score and hygiene score (in Tables 15 and 16).

Sex was found to have a significant effect on attitudes about control of fertility and knowledge of reproduction, while non-significant F-ratios were obtained for the effect of age and number of children on all the dependent variables in the study.

CHAPTER VI

DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

In this chapter, the study will be summarized, limitations of the study presented, findings discussed in relation to related research and literature, and implications for home economics programs, development policy and research stated.

Overview of the Study

The study was undertaken for the purpose of examining relationships of demographic variables such as sex, age, number of children and environment on factors affecting family size decisions in a developing country. The study focused on such factors as fertility goals, standards, and attitudes about control of fertility, levels of information, use of community resources and income.

A home-management framework with an ecological emphasis was employed in the study. The reported desired family size was regarded as a fertility goal, and the ideal number of children as a fertility standard. Measuring attitudes about fertility control, being of importance in directing fertility decisions, was of special interest. For this purpose a Guttman type scale was developed. In order to determine such a resource as levels of information related to fertility decisions, scores were computed from answers on fixed-alternative questions. Use of community resources was determined

by a ratio of utilized resources during the previous year, over existing resources in the community.

Three areas in Swaziland were selected, representing different social and economic environments. Data collection took place in July-August, 1976. Altogether, 73 men and 96 women were interviewed. The data were collected by students from the College of Agriculture, University of Botswana and Swaziland.

Least squares analysis was used in order to test relationships.

Limitations of the Study

The limitations of survey research in studying such a complex phenomenon as aspects of family size decisions are recognized. Data obtained through simple closed-end questions, as used in this study, fulfill the criterion of objectivity, but leave much to be desired when it comes to interpretation of, for example, a "yes" or a "no," "agree" or "disagree." It is hazardous to derive meaning, implications and predictions from any research findings within the social sciences, however ambitious the researcher might have been with validity and reliability testing. It is indeed questionable if two-way variable relationships ever can be indicators of complex sociocultural behavior patterns.

It is, further, generally assumed that the meaning of empirical relationships discovered through statistical manipulation derive entirely from the data themselves and is not imparted by the researcher. Findings from a study of interpretation of data from a

KAP study in Bangladesh showed the opposite (Studies in Family Planning, 1976: 322-33). It was found that the analyst's degree of familiarity with the culture varied directly with his interpretation and conclusions. The Western analysts were found to be concerned more with context free "rates" and objectives and less with people, while analysts more familiar with the Bangladesh culture related their analyses to the understanding of problems.

In addition, the cross-cultural setting of this study must be considered in interpreting research findings. The cross-cultural setting was, in fact, three dimensional; the research leader using a second language as a medium of communication throughout the research process as well as being a foreigner in the cultural setting itself. The latter was probably the most difficult to overcome. In spite of the study of the Swazi culture and language, the fact remains that the problems were seen through Western eyes, Western research methods were applied and Western-biased conclusions and implications were drawn.

Discussion and Conclusions

The findings will be discussed under the following headings: studying fertility behavior, and the influence of environment, sex, age, and number of children, respectively.

Studying Fertility Behavior

Efforts, in trying to understand human fertility behavior, or rather human fertility control behavior, and how the onset of fertility decline takes place, have so far given disappointing

results. Few predictions have been accurate, attitudes have not conformed with behavior, identified key-variables have started to lose influence, to mention some examples. The sudden rise in birth rates in North America and Europe after World War II, as well as the subsequent marked decline in the 1960s, came as a surprise. The "baby boom" generation delayed the birth of their children and generally decided on less children than their parents. Recently, the slight drop in birth rates in developing countries has come about without a matching rise in living standards, which often has been considered as a necessary condition (The Economist, Jan. 8, 1977: 72-73).

Some of these inconsistences in fertility research might originate in the fact that there are some unique aspects of studying fertility behavior. Firstly, the subject in itself was, until recently, completely taboo. Secondly, it is difficult to find valid indications of attitudes and actual behavior, let alone change, in these areas. Actual number of children or intervals between children are not necessarily good indications either of attitudes or behavior. Thirdly, if motivation and readiness for controlling fertility exist, the means must be socially accepted and conveniently available. The means, as history has shown, do not necessarily have to be modern contraceptive devices, but must be perceived and accepted by the society. Fourthly, it has more often than not been forgotten that there are always two people involved--only one, the woman, has generally been studied.

Various approaches have lately been used in trying to explain the mechanism, on the micro level, leading to decline in fertility and change in family size norms. The significance of a change from consumption to production aspects of children has been advocated (Becker, 1960). Similarly, there is the necessity of a switch of wealth flow to occur; traditionally flowing from children to parents, but changing direction in the course of social and economic development (Caldwell, 1977). De Tray (1972) found female opportunity time and female level of education crucial, and Ryder (1973) and Clay and Zuiches (1977) stressed the importance of studying fertility behavior in relation to family size norms of the family of orientation and reference groups.

A family decision-making framework has not yet been employed to any great extent in the search for explanations and reliable predictions of fertility behavior. As stated earlier, family decision-making is a complex mental process, which does not easily lend itself to investigation. In this study, just a few factors that influence this process were examined. Of these factors, it was found that the environment had a significant effect on several aspects of fertility decisions. These findings are not surprising, nor unique, but the implications are of extreme importance in planning development activities.

The Influence of the Environment

Social and economic aspects of family environments have been found to have significant influence on fertility behavior all over

the world (Kiser and Wilson, 1968; Caldwell, 1967; Mauldin, 1953; Berelson, 1966; Allen, 1973). Generally, findings have indicated that more traditional fertility values and more negative attitudes towards control of fertility exist in rural, compared with urban, settings. The findings in this study support this generalization. Both the number of desired and ideal number of children were highest for Velezizweni and lowest for Bhunya, while Luyengo fell in between. Moreover, the respondents in Bhunya were the most positive towards control of fertility. However, the respondents in Luyengo were the least positive with Velezizweni falling in between. Possibly, the hardship of raising children was felt less in the Luyengo area, where life is sustained on a mixture of the two extreme economic systems. The actual number of children was largest in Velezizweni, closely followed by Luyengo, with a considerable drop for Bhunya.

Interdependence between the environment and the family decision-making process is also well documented in home management literature (Deacon and Firebaugh, 1975: 95-101; Paolucci, Hall, and Axinn, 1977: 29-49). The culture, embracing social and economic aspects of the environment, has an indisputable influence on decision-making. Paolucci et al. (1977) state that "Culture is an adaptive mechanism, providing ready-made solutions to the problems encountered by the group" (p. 47). There is a limitation of choice in a traditional culture, while decision-making in the course of social and economic development tends to become more conscious, goal-oriented, and rational.

It can, of course, be argued that it is not the influence of the environment that has created differences, but rather the personality traits of people living in different environments. In studies concerned with the urbanization process, it has, for example, been found that older, less educated, more traditional, less flexible people tend to stay in rural areas while young, better educated, more progressive and achievement-oriented people are more prone to migrate to urban areas. In Swaziland, this is to some extent also true, particularly related to age and education. However, in the case of Bhunya where labor for the industries mostly has been recruited locally and trained on the job, the personality factor can be assumed to be minimized.

In order to draw conclusions from the findings in this study, it would be desirable to know where, on the continuum from traditional Swazi to a complex Westernized society, the three research areas are located. Obviously, Velezizweni has more components of Swazi traditional culture than Bhunya.

Generally, objective information about the extent of the assimilation of Western culture and how families adapt to complex and accelerating change presently taking place in Swaziland is almost an unexplored field. Comparatively more is known about the traditional Swazi life through anthropological and ethnological studies carried out in 1930-40 (Englebrecht, 1930; Marwick, 1940; Kuper, 1947, 1963, 1965).

In 1940, Marwick wrote:

> Most impressive is the fact that Swazi culture remains a working whole, in spite of the influence of European civilization. Many elements of European culture have been assimilated, e.g., the use of the plow and of blankets, but the whole synthesis of essentially Swazi culture is still preserved. Sanctions and institutions which existed prior to European influence still operate even where attempts have been made to uproot certain elements of culture. Examples are frequently of Christian converts who, as soon as some trouble befalls them, hasten to consult the witchdoctors.
>
> This led me to the realization that Swazi culture is still very real, and that it is closely woven into the fabric of the people's lives and maintained there by their own institutions (p. xiii).

Since then much has happened, but to some extent Marwick's observations still hold. There has been, particularly since Independence, an outspoken desire to cherish Swazi traditions, beliefs and customs. The fact that Swazi culture has been more resistant to outside influence, Nxumalo (1976) attributes to circumstances such as Swaziland being a unified and integrated nation before the imposition of British rule, in contrast to most other modern African countries. A common language was spoken, a common culture existed, and the country owed allegiance to a single king.

Nevertheless, erosions of Swazi culture are noticeable, particularly among people living in towns or those otherwise affected by modern economy such as employees of the large rural industrial companies, of which Bhunya is one example. This is particularly true for the second generation growing up in this environment, which is radically different from traditional patterns of Swazi life. Maybe the introduction of Western education first brought by the missionaries and later controlled and expanded by the British has in itself been the greatest agent of change. Other

factors which have accelerated change in Swaziland, as summarized by Nxumalo (1971), are the imposition of taxes combined with the effect of the division of land which forced the rural adult Swazi male into various types of paid employment. Even if the homes were left, only temporarily, for employment in mines, farms, or in industries developing in urban areas abroad or in Swaziland, the workers brought home impressions from a totally different world which doubtless has had its impact on cultural change.

Being unable to determine exactly where in the transformation process the three communities are, it is still safe to draw the conclusion that the environments of the three selected research areas differ considerably. Most obvious is the difference in physical environment, particularly between Velezizweni and Bhunya. There is a sharp contrast between the spacious hills of Velezizweni, with each family commonly residing in several huts, and the restricted yards of Bhunya that surround the small housing units. This is bound to have a significant influence on family size standards and attitudes about control of fertility. Nevertheless, the dual living pattern of families in Bhunya should be kept in mind. If too much crowding is experienced, it is most likely that a part of the family will be sent off to the rural home.

Social and economic aspects of the three environments are equally contrasting. A summary of some of the community resources available in the three areas is presented in Table 29. For a verbal description, see Chapter IV, pages 42-54. The majority of families in Velezizweni live at a subsistence level, while Bhunya

TABLE 29.--Summary of Available Community Resources by Area.

Resource	Velezizweni	Luyengo	Bhunya
Water supply	River	Irrigation furrow	Bays
Grocery store	X	X	X
Primary school	X	X	X
Home economics extension	X		X
Nursery school		X	X
Lower secondary		X	X
Clinic		X	X
Family planning services		X	X
Outdoor market		X	X
Post office		X	X
Beer hall		X	X
Agriculture extension	X		
Higher secondary		X Boys only	
Electricity			X
Sport field			X
Cinema			X

was created for the very purpose of housing wage earners at the pulp mill. Although the Luyengo settlement was once planned and built by outside authorities, the community can now be assumed to be developing at its own pace and direction, resulting in a blend of traditional as well as modern patterns of living.

The exposure of new ideas and a new life style is inevitable in Bhunya, regarding such community resources as frequent communications with Mbabane and Manzini, film shows, sports and music festivals, availability of daily newspapers, better educational facilities for both children and adults, and not the least of special interest in this study, family planning services with slightly different features than just the "clinic approach." The daily contact with expatriates, as well as Swazis with training or work experience commonly from the Republic of South Africa, is also likely to have great impact.

Although the well-planned community of Bhunya offers plenty in terms of community resources, the degree of utilization was found to be lower than for Velezizweni and Luyengo. The findings might be attributed to the well-known supply-and-demand relationship. It might also result from a feeling of non-belonging in this community that was created by representatives from a different culture with very different premises of living.

Also unexpected are the low levels of information in Bhunya. In spite of the most active family planning approach, the level of reproductive information was the lowest. It is only in the level of nutrition information that Bhunya scored higher than the other communities. In line with a theory of information overload, information might be blocked out in this more complex environment.

Regarding the low level of reproductive information in Bhunya, one interpretation is that the traditional system of sex education has ceased to function in Bhunya. No other institution,

certainly not the church, which rather has discouraged spread of such information, nor the school, have taken over this function in the urban society. In Velezizweni, on the other hand, having the highest level of reproductive information, parents and grandparents still seem to carry out their traditional roles as sex educators with some success.

Comparing community resources between Velezizweni and Luyengo, one finds a rather equal distribution. In the push for rural development, Velezizweni, being centrally located and fairly close to Mankhyane, one of the major towns in the country and center for an integrated rural development project, cannot be considered a forgotten, backward rural area. For example, agricultural extension services exist on a regular basis in Velezizweni but not in Luyengo, in spite of farming activities, even on a cash crop basis. In the case of home economics extension activities, the situation is the same, although a women's group has recently been started in the Luyengo settlement. Levels of information are, nevertheless, lower for Velezizweni, with the exception of reproductive information, hygiene information and farm practices. Regarding the influence of modernization and the degree of social and economic development, however, there is doubtless a difference between the two communities. Being located close to one of the main roads in one of the economic "core regions" in the country, the population of Luyengo is more frequently exposed to new influences and has incorporated more of them into their own lives.

The near social family environment is equally different, particularly comparing Velezizweni and Luyengo on the one hand, and Bhunya on the other (see Tables 8 and 11). The degree of nucleation of the family structure is obviously higher in Bhunya. This is to a certain degree a forced process, related to housing regulations by the company and can, nevertheless, be assumed to have an impact on the relationships here examined.

The Influence of Sex

It was felt necessary to interview both men and women. First of all, information from men about family size decisions is rare, and also for the reason that differences in goals, standards, and attitudes were anticipated. However, only for two variables reflected significant differences between men and women were recorded: population attitude score and level of reproductive information. Women scored higher in both cases. Men desired more children and considered a greater number of children ideal for a Swazi family, although the finding was not significant.

Women's motivation for controlling fertility is in line with findings from several other studies (Mauldin, 1953; Allen, 1953). Increasingly, Swazi women are experiencing the hardship of raising children, often being left alone with this responsibility. Even if the majority of women in the study were living together with a man at the time of the study, many unions are of a temporary nature.

Among men, polygamy is still the ideal family structure, although legalized polygamous unions are decreasing (Ministry of Local Administration, 1970). The influence from the Church as well as economic pressures have contributed to this development. In urban areas, particularly where family support is dependent on wages, which hardly allow for supporting one wife and her children as well as an increased cost of living, the polygamous family cannot survive. However, still guided by traditional values, it is not unusual that a man when getting tired of his wife will pick another female partner. Due to the impossibility of supporting them both, the first wife is usually left on her own. This is not imcompatible with Swazi law and custom, but there is no legislation implemented to protect women in this sense. Instead of being a respected senior wife, she will have to look for a job outside the home in order to support herself and her children.

Among educated women with possibilities of supporting themselves and their children, there seems to be a novel attitude against payment of dowry and traditional marriage bonds. Without payment of dowry, the children belong to the mother and her family, and the risk is not taken of having to support not only the husband, but also additional wives. There is doubtless a growing resentment among women about their increasingly unfair and insecure situation, accentuated by economic and social changes.

African men have often been accused of being lazy, and doubtless they have always had a privileged position. The fact that men lost their important roles as warriors and hunters a long time

ago provides one explanation. An unequal distribution of duties and responsibilities is often witnessed between Swazi men and women. The majority of women have gained little from the development that has taken place. Their situation has rather become more demanding, particularly for those having to combine work outside the home, on the one hand, and child rearing and other household duties on the other.

A significant pooled interaction between sex, age, and social and economic environments was recorded in relation to level of reproductive information. Unfortunately, the analysis does not provide information to draw conclusions of between which variables there was an interaction and the direction of these interactions. Because the effect of sex in itself was significant this would suggest that in spite of interaction within the levels of age and environment, clear differences based on sex were apparent.

The Influence of Age

No significant effect of age was found on any variable in the study. In a fast-changing society, one would expect that younger people would more easily adopt new norms, and also, being better educated, have higher levels of information. This, however, was not noted.

The Influence of Actual Number of Children

Using the actual number of children as a source of variance, no significant effect on desired or ideal number of children, nor on

population attitude score and levels of reproductive information, was found. These findings hold for both men and women and matched couples. Thus, the conclusion can be drawn that decision-making about family size is not yet rational nor goal-oriented. However, even if relationships are weak, having fewer children is related to a smaller family norm and more positive attitudes about control of fertility.

Although the traditional Swazi culture could be described as a maximum fertility culture, there exist concepts of spacing children. As in many other polygamous African cultures, it was a custom not to have another child until the first-born was weaned, usually resulting in a two-year interval between children. It is believed that if the mother became pregnant again before the child was weaned, her milk would become poisonous. This norm might also originate from the times of frequent warfare when villages suddenly had to be vacated. Women should then have only one child that needed their full attention (Marwick, 1966: 33).

Traditionally, women also stopped bearing children when their first child reached the age of puberty. Moreover, the limitation of one son for the woman designated to become the future Queen Mother, to reign the country together with the son, is another traditional concept.

The major conclusions from findings in this study are that traditional fertility values tend to be prevalent in less advanced stages of social and economic development. Women were more motivated than men to control fertility, although men and women differed

slightly in the number of children they desired or considered ideal. The level of reproductive information decreases in the transformation to a modern society. Age was not a determining factor on attitudes about fertility control, nor fertility goals, standards or levels of information. Finally, since the actual number of children did not influence fertility goals, standards and attitudes about fertility control, it was concluded that fertility behavior in the three investigated communities was on the whole not goal-oriented.

Implications for Home Economics Programs

Based on the reported association between environments and attitudes toward fertility, the overall implication for home economics program development, based on findings in this study, is the need for program activities to be more directed towards changing the environment than delivering information to individuals. This would be facilitated through close coordination with other development activities as well as more active involvement in community affairs.

Another means of initiating change in the environment, which home economics programs can support, is the creation of job opportunities, particularly increased participation of women in paid employment or self-employment. Promotion of increased agricultural production being the backbone of economic development, involvement in related activities should be of special concern.

Both men and women should be involved in home economics program activities. Many of these activities are not, as often believed, related only to women's roles. To prepare, particularly

youth, for a modification of sex roles in a more pluralistic society is of great importance.

Including population education components in home economics programs would have implications for fertility decisions. The low level of reproductive information as well as unfavorable attitudes towards control of fertility among men found in this study point to the necessity to direct these programs also to men.

However, subject content of home economics programs must focus on family goals competing with the goal of having a large family. Family health, particularly child health, is such a goal. Making mothers and fathers aware of the needs of children to grow to healthy, productive individuals may be an effective means of delivering family planning messages as well as changing family size norms.

Educating children is another family goal of great priority in Swaziland, which home economics programs should capitalize on in order to create a desire to limit the number of children in favor of a stronger emphasis on human resource development. In stressing the importance of education, home economists must also concern themselves with the content of the school curriculum and methods of teaching, contributing to the relevance of home economics teaching as well as other curricula taught.

Home improvement is another home economics subject area which might be attended to with implication for environmental changes. Improving the home or building a new home are family goals often expressed by Swazi families.

All home economics subject areas lend themselves to the training of decision-making skills, which should be given high priority. As findings in this study indicate, there is a need for home economists to serve as a link, and information processor, between the community and the family, when complexity increases in the environment. This can be facilitated through formal and non-formal educational channels. An important function should be to provide information and feedback of already existing environmental support systems in order to maximize utilization of these services and ensure that needs of families are met.

Implications for Development Policy

The strong environmental influences on factors affecting fertility decisions found in this study support the argument that improved living conditions accelerate decline in fertility and development toward a smaller family size norm (Ceres, Nov.-Dec., 1973). The position taken by earlier advocates of the theory of the demographic transition that urbanization and industrialization are pre-conditions for fertility decline, runs, however, against sound development policy. First, the social problems and human misery, particularly in connection with too rapid urbanization, are too well witnessed in the Third World today and need not be elaborated on any further. Second, there are examples of nations where fertility has declined without massive urbanization and industrialization. The People's Republic of China provides an outstanding example.

For these reasons, and based on findings from this study, forceful rural development policies, changing the family environment and raising levels of living in high-fertility areas are imperative for the evolution of a smaller family norm. The findings also point to the fact that semi-rural and semi-urban societies, where high fertility values often linger, should not be neglected. Often belonging to "no one's land" in terms of development programs, as is the case in Swaziland, these areas are left behind.

With 90 percent of its population living in rural areas, rural development programs do occupy a central position in Swaziland's development strategy (Second National Development Plan, 1973-77: 15-26). A family-oriented program with special emphasis on population education, "Planning for Better Family Living," has also been approved and preparatory activities started (Government of Swaziland, Ministry of Health, 1976). Nevertheless, Swaziland still lacks a population policy per se, which would state objectives of altering or changing existing population trends or characteristics.

It is also questionable if the magnitude of these efforts is large enough to have an impact on lowering fertility, to the extent that would be desirable. The allocation of resources is, doubtless, still more favorable for urban areas.

Establishment of industrial communities in rural areas is another means of changing social and economic environments without massive urbanization. The creation of Bhunya is one example. Findings in this study indicated that change in fertility behavior

has taken place in this new environment. This has happened in less than 25 years, which must be considered a very short time in relation to changing attitudes and behavior. If, in addition, genuine emphasis on creating sources of cash income for women was instituted, the magnitude of the change might have been greater still.

Bhunya can, in fact, be looked upon as an integrated development program on a large scale. However, created with private capital and having private profit interests as the ultimate goal, there are some less desirable aspects of this establishment. Some of these are the low wage level created by a static labor situation and ample supply of labor, the lack of participation of workers in the management process and, generally, the company's paternalistic way in handling matters.

Regarding relationships between goals, standards, and attitudes, the findings in this study indicated a trend in Bhunya towards a more rational and goal-oriented fertility behavior. These findings fall in line with previous assumptions of increased rationality in the course of social and economic development. Nevertheless, it can be argued that fertility decisions in societies of every type and stage of development, in fact, are rational. It all depends on what kind of rationality the discussion is based. If it is economic rationality, which often is the case, it then depends on how familial and societal goals are transferred into money terms.

To identify these values must be the task of individual families. The development worker, whether a home economist, agriculturist, health or community development worker, on the other

hand, should assist families with bringing decision-making processes to the level of awareness, particularly stressing the relationship between family goals and resources.

In an increasingly complex environment, decision-making skills will be of the greatest importance. Any development program needs to incorporate micro decision-making. It can be facilitated through decentralization of political decision-making, through establishment of cooperative societies for different purposes, through consumer education, and farm and home management information. This means an active participation in the development process at all levels.

To summarize, development activities leading to an overall decline in fertility must first of all concentrate on reshaping the environment in rural areas; making rural living more profitable, more attractive and comfortable. Much greater proportions of resources need to be allocated to these areas to create such a change. New job opportunities must be created to raise income levels, through agricultural development programs and through the establishment of rural industries. In general, development efforts must be integrated, incorporating improved formal and nonformal education, health and family planning services, less guided by Western tradition but building on cultural and economic realities. Of special importance is the training of decision-making skills, at all levels, bringing the family decision-making process to the level of awareness, resulting in rational and conscious decisions about family size.

Implications for Further Research

Beginning 15-20 years ago, when rapid population growth became a concern, valuable time was lost in trying to understand global population trends, while research on a family level was neglected. This study attempted to explore factors affecting fertility decisions, involving both men and women. Nevertheless, the data gathered can only begin to integrate information about the effects of selected demographic variables and environmental influences.

Only a part of the data that were collected have been reported in this dissertation. For further managerial research, secondary analyses could be performed. Of special interest would be to carry out factorial and item analyses on data recorded on attitude statements in relation to specific variables. Concerning data collected from the matched couples, it might be more fruitful to aply correlation analyses of husband's and wive's answers rather than the analysis used in the study.

The population attitude scale, proven to be of acceptable reliability and validity, could be used in studying effect of population education, such as campaigns and/or audio-visual materials.

In order to study interrelationships within the family system as well as between the family and the environment, an in-depth study with stronger social anthropological emphasis, over a period of time, would need to be undertaken. Preferably a few families could be selected from each of the three research areas used in this

study, and studied over a period of time. This would contribute to a family ecological perspective. An interesting dimension would be added if families of different stages in the family life cycle would be selected.

APPENDICES

APPENDIX A

COMPLETE QUESTIONNAIRES

APPENDIX A

COMPLETE QUESTIONNAIRES

Pages marked with "h" were information gathered only from husbands, while pages marked with "w" were information gathered only from wives. In the case of pages marked both "h" and "w," questions were addressed both to husband and wife.

Name of enumerator:_____

Date of interview:_____

QUESTIONNAIRE A

Questions to be asked of all wives

Could you please start with giving some information about yourself.

Area:_____

Name:_____

Name of head of household:_____

Relationship to head of household:
1. Senior wife
2. Junior wife
3. Only wife
4. Other, specify
5. Widow

Husband present:
1. Yes
2. No

Age: _____

Occupation: _____

No. of children: _____

No. of children living with you other than your own: _____

Education (highest level completed):
1. None
2. Literacy
3. Primary
4. Lower Secondary
5. Higher Secondary
6. Other, specify

Religion: _____

Name of enumerator:_____

Date of interview:_____

QUESTIONNAIRE B

Questions to be asked of husbands/head of households

Could you please start with giving some information about yourself.

Area:_____

Name:_____

Age: _____

Occupation: _____

No. of children: _____

Education (highest level completed):

1. None
2. Literacy
3. Primary
4. Lower Secondary
5. Higher Secondary
6. Other, specify

Religion:
Religion: _____

How long have you lived in this area? _____

From where did you move? _____

Is the house your family is living in owned or rented by you?

1. Owned
2. Rented _____ rent/month
3. Other

1h

HOUSEHOLD CENSUS

Now, let's start with discussing the members in your family

Name	Relationship	Sex	Age	Birthplace	Is he/she	Of the children born by this woman	
	State relationship to head and other members of the household, specifying order numbers, e.g., "son of 1 & 2."	M for male, F for female	In completed years	If born in Swaziland, state District. If born outside Swaziland, state country.	Now attending Full-time education, yes or no.	How many are now living with her?	How many are now living elsewhere?

2 h V

VELEZIZWENI

Utilization of Environmental Resources

Environmental Resources — Checklist for each family

Resources	Have never heard of it (here)	Have heard but never attended	Household member has used, attended, or consulted	How often	Would use but cost is expensive
Hospital, Mankayane	____	____	____	____	____
Sangoma	____	____	____	____	____
Inyanga	____	____	____	____	____
Primary School	____	____	____	____	____
Velezizweni Primary, S.A.G.M.	____	____	____	____	____
Junior Secondary School, Nkabanene	____	____	____	____	____
Senior Secondary School, Mankayane Central	____	____	____	____	____
Adult Literacy Class, near Mankayane	____	____	____	____	____
DS. Demonstrator	____	____	____	____	____
Agriculture Extension	____	____	____	____	____
Sunday School, S.A.G.M.	____	____	____	____	____
Farmer's Association	____	____	____	____	____
Farmer's Coop. Society	____	____	____	____	____
Communal Garden	____	____	____	____	____
Churches (Zionist, Methodist, Apostolic Church, Roman Catholic)	____	____	____	____	____
Bus Service	____	____	____	____	____
Grocery Store	____	____	____	____	____

2 h L

LUYENGO

Utilization of Environmental Resources

Resources	Have never heard of it (here)	Have heard but never attended	Household member has used, attended, or consulted	How often	Would use but cost is expensive or other reason
Clinic, where?_____	____	____	____	_____	____
Inyanga, where?_____	____	____	____	_____	____
Sangoma, where?_____	____	____	____	_____	____
Nursery School where?_____	____	____	____	_____	____
Primary School where?_____	____	____	____	_____	____
High School where?_____	____	____	____	_____	____
Adult Literacy class, where?_____	____	____	____	_____	____
Creche, where?_____	____	____	____	_____	____
Sunday School where?_____	____	____	____	_____	____
Churches (Zionist, Methodist, Episcopal, Roman Catholic, other)	____	____	____	_____	____
Shops:					
Grocery, where?_____	____	____	____	_____	____
Butchery, where?_____	____	____	____	_____	____
Bus Service	____	____	____	_____	____
Taxi Service	____	____	____	_____	____
Beer Hall	____	____	____	_____	____
Sports Field	____	____	____	_____	____

2 h B

BHUNYA

Utilization of Environmental Resources

The following questions are about the help you get from the community.

Resources	Have never heard of it (here)	Have heard but never attended	Household member has used, attended, or consulted	How often	Would use but cost is expensive or other reason
Clinic, where?_____	____	____	____	_____	_____
Inyanga, where?_____	____	____	____	_____	_____
Sangoma, where?_____	____	____	____	_____	_____
Schools:					
Creche, where?_____	____	____	____	_____	_____
Sunday School_____	____	____	____	_____	_____
Primary School_____	____	____	____	_____	_____
Secondary School_____	____	____	____	_____	_____
Zondle feeding scheme	____	____	____	_____	_____
School committee	____	____	____	_____	_____
Adult Literacy Class, where?_____	____	____	____	_____	_____
Domestic Science Class, where?_____	____	____	____	_____	_____
Red Cross Club, where?_____	____	____	____	_____	_____
Churches (Zionist, Methodist, Anglican, Nazarene, Other)_____	____	____	____	_____	_____
Shops:					
Grocery, where?_____	____	____	____	_____	_____
Butchery_____	____	____	____	_____	_____
Vegetable market_____	____	____	____	_____	_____
Dry cleaning_____	____	____	____	_____	_____
Restaurant_____	____	____	____	_____	_____
Beer Hall_____	____	____	____	_____	_____
Post Office_____	____	____	____	_____	_____
Bank, where?_____	____	____	____	_____	_____
Town Clerk Office	____	____	____	_____	_____
Club House					
Are you a member?_____	____	____	____	_____	_____
Town Hall					
What activity?_____	____	____	____	_____	_____

Utilization of Environmental Resources, 2 h B, Bhunya, continued.

Resources	Have never heard of it (here)	Have heard but never attended	Household member has used, attended, or consulted	How often	Would use but cost is expensive or other reason
Stadium What activity?_____	____	____	____	_____	_____
Sports field What activity?_____	____	____	____	_____	_____
Tennis courts	____	____	____	_____	_____
Nursery	____	____	____	_____	_____
Poultry scheme	____	____	____	_____	_____
Facilities in Mhlembanyathi, What kinds?_____	____	____	____	_____	_____
Bus Service	____	____	____	_____	_____
Taxi	____	____	____	_____	_____

Farm Practices

Now, could you please give us some information about your farm.

1.	Do you grow more than 4 crops other than maize?	1. yes 2. no
2.	Did you produce more than 18 bags of maize in 1974/75?	1. yes 2. no
3.	Did you produce a surplus over your requirements in 1974/75?	1. yes 2. no
4.	Do you own the three basic farm implements: mouldboard plough, planter, and cultivator?	1. yes 2. no
5.	Do you own oxen?	1. yes 2. no
6.	Do you use hybrid maize seed?	1. yes 2. no
7.	Do you use a grain tank?	1. yes 2. no
8.	Is your storage capacity more than 18 bags?	1. yes 2. no
9.	Do you chemically treat maize?	1. yes 2. no
10.	Do you sell maize?	1. yes 2. no

We are also interested in your yearly cash family income. This is just for our use.

Cash Income

What was approximately the cash family income in Emalangeni, last year?

1.	0.00- --	_____	6.	200.00- 440.00	_____
2.	1.00- 9.00	_____	7.	450.00- 699.00	_____
3.	10.00- 49.00	_____	8.	700.00- 999.00	_____
4.	50.00- 99.00	_____	9.	1,000.00-1,999.00	_____
5.	100.00-199.00	_____	10.	2,000.00-over	_____

1 2
4 h

Family Size

Now, I would like to discuss factors which concern the size of your family.

1. If you could have exactly the number of children you want, what would that number be? ___No. of children

2. Would you like to have more children? 1. yes 2. no
   If yes, why?_____
   If no, why?_____

3. Would you like to have less children than you have? 1. yes 2. no
   If yes, why?_____
   If no, why?_____

4. What do you think would be the ideal number of children for Swazi families, if they could control the number as they wish? ___No. of children

5. Have you ever discussed the number of children you want with anyone? 1. yes 2. no
   If yes, with whom?_____
   (Wives only)

6. What are the names of your children?

1._____	7._____
2._____	8._____
3._____	9._____
4._____	10._____
5._____	11._____
6._____	12._____

7. When was your last child born?_____
   Is the child still alive? 1. yes 2. no

8. Did any of your children die? 1. yes 2. no
   If yes, how many?_____

9. Suppose you have a very close friend in the same circumstances as yourself, and she asked you for advice on the convenient number for her. What is the number of children you would advise her to have, if she could? ___No. of children

2 w
5 h

Marriage

Now, I would like to have your opinion about marriage.

1. Do you think a man should have more than one wife?
   1. yes
   2. no

   If yes, why?_____
   If no, why?_____

2. Are you married? (A)
   A 1. yes
   2. no

   If yes, how were you married? (B)
   B 1. civil ceremony
   2. traditional
   3. Christian

3. Which marriage ceremony would you like for your children?
   1. civil ceremony
   2. traditional
   3. Christian

4. Do you think a couple can consider themselves married if "Lobola" has not been paid?
   1. yes
   2. no

5. (Wives only)
   Did your husband's parents pay Lobola for you?
   1. yes
   2. no

6. Do you think it is right for a young couple to have sexual relationship before they are married?
   1. yes
   2. no

   If yes, why?_____
   If no, why?_____

7. Do you think it is better for a girl to become pregnant before she is married?
   1. yes
   2. no

   If yes, why?_____
   If no, why?_____

8. How old do you think on the average, that a girl and boy should be getting married?
   ____a boy
   ____a girl

9. Do you think it is something strange when people have been married for a couple of years without having any children?
   1. yes
   2. no

   If yes, why?_____
   If no, why?_____

10. What do you think about a couple who have a baby every year?

11. What do you think about grandmothers bringing up children?

3 w
6 h

Family Goals

What do you think about your family and the future?

1. Do you believe that actions you and other family members take today will influence the future of your family? 1. yes 2. no

2. Do you sometimes discuss the future with other family members? 1. yes 2. no

3. Do you think families nowadays are trying to plan more for the future than in olden days? 1. yes 2. no

4. Do you think that what you are going to do in life is predetermined? 1. yes 2. no

5. Have you at any time discussed with other family members anything specific you wanted to achieve when it comes to the following?

   a. Children's education 1. yes 2. no

   If yes, with whom did you discuss?

   _____

   What were the goals agreed upon?

   _____

   What did you do to try to achieve them?

   _____

   b. Moving to another place? 1. yes 2. no

   If yes, with whom did you discuss?

   _____

   What were the goals agreed upon?

   _____

   What did you do to try to achieve them?

   _____

   c. Introducing new agricultural methods 1. yes 2. no

   If yes, with whom did you discuss?

   _____

   What were the goals agreed upon?

   _____

   d. Extending or building a new house 1. yes 2. no

   If yes, with whom did you discuss?

   _____

   What were the goals agreed upon?

   _____

   What did you do to try to achieve them?

   _____

4 w
7 h

Family Goals, continued.

e. The number of children in your family — 1. yes 2. no

If yes, with whom did you discuss?

_____

What were the goals agreed upon?

_____

What did you do to try to achieve them?

_____

f. Marriage of your children — 1. yes 2. no

If yes, with whom did you discuss?

_____

What were the goals agreed upon?

_____

What did you do to try to achieve them?

_____

g. Family problems — 1. yes 2. no

If yes, with whom did you discuss?

_____

What were the goals agreed upon?

_____

What did you do to try to achieve them?

_____

6. Is there anything in life that you would very much like to achieve and you believe that you probably could? 1. yes 2. no

If yes, what is that?

_____

What means would you use to reach that goal?

_____

7. What is most important for you in life?

_____

8. What would you do first if you suddenly got a lot of money? Select three and rank in order:

____send all children to school
____buy cattle
____improve and extend your home
____buy a refrigerator
____buy a stove
____buy new clothes
____buy a new car
____buy a tractor
____buy imputs for the farm
____start a business
____offer to ancestors
____don't know

5 w
7 h

Population Attitude Scale

Now we will read some statements that people have made, and we want to know if you agree or disagee.

		Agree	Disagree
1.	Most mothers want fewer children because men fail to support them nowadays.	____	____
2.	There is no limit to the number of children a person should have.	____	____
3.	It would be desirable to be able to decide how many children one gets.	____	____
4.	Most mothers want fewer children, because then each can get the best in life.	____	____
5.	A woman should have many children in case some die.	____	____
6.	One cannot decide how many children one would like to have.	____	____
7.	More children should be born in Swaziland.	____	____
8.	It is better to decide on the number of children one wants, because by doing so one will be able to manage them properly.	____	____
9.	In order to decide how many children one wants, husband and wife must cooperate.	____	____
10.	Nowadays there are means to decide how many children one wants.	____	____
11.	Parents should have as many children as they like.	____	____
12.	There is no way to prevent pregnancy.	____	____
13.	In the next generation no woman should have more than five children.	____	____
14.	Most women want to have a lot of children.	____	____

5 w
7 h

Population Attitude Scale, continued.

		Agree	Disagree
	Additional Population Statements		
15.	It is better for an unmarried woman to have an abortion than bear an unwanted child.	____	____
16.	All young people should be educated in means to avoid pregnancies.	____	____
17.	I believe that a man cannot feel fulfilled if he has never fathered a child.	____	____
18.	No woman should be denied the right to use means to avoid pregnancies when she does not want children.	____	____
19.	Availability of effective means to avoid pregnancies will lead to an increase in promiscuity.	____	____
20.	If the population increases rapidly in a poor country, there will be less possibility for economic development.	____	____
21.	To limit the number of children born should not be a concern, because there will be enough resources for all children born in this world.	____	____
22.	I believe that having children is not necessarily the best way for couples to enrich their marriage.	____	____

---

6 w
9 h

Family Expenditures

Have you ever thought about the expenses you have in your family--your expenses daily, weekly, and yearly? We are interested in knowing if your income is covering your expenses, and if you still are able to save.

6 w
9 h

Family Expenditures, continued.

1. Approximately how much do you spend on the following items? How often do you have this expense?

Expenditure	Value/time unit	Value/year
Groceries		
Alcoholic drinks		
Tobacco		
Textiles, clothing		
Transportation		
Milling		
Taxes		
Rent		
Cash savings		
Seeds		
Hired labor		
School fees, textbooks, uniforms, health		
Other		

2. Do you sometimes buy on credit? 1. yes 2. no

   If yes, what?_____

   _____

3. Do you sometimes borrow money to manage expenses? 1. yes 2. no

   If yes, what kind of expenses?_____

   _____

4. Do you sometimes get help from relatives with expenses? 1. yes 2. no

   If yes, what expenses?_____

   _____

5. Have you received any substantial gifts during the last year? 1. yes 2. no

   If yes, what or how much?_____

   _____

6. Have you saved any cash money during the last year? 1. yes 2. no

   If yes, where do you keep the money?

   ___in the house ___in the bank ___other place

7 w

Hygiene

We are concerned about the health of your family, so could you please give us some information about the following?

1. Do you boil your drinking water?
   1. Never
   2. Sometimes
   * 3. Almost always

2. Do you think one should boil the drinking water?
   * 1. Yes
   2. No

   If yes, why?_____

3. Do you boil milk before giving it to the children to drink?
   * 1. Yes
   2. No
   * 3. Using commercial milk

4. How do you store food?

Food	In what container?	Where?
Sugar		
Bread		
Mealiemeal		
Beans		
Potatoes		
Vegetables		
Onions		
Porridge		
Eggs		
Water		

5. How do you wash cooking and serving dishes?
   1. Cold water in a basin
   * 2. Heated water in a basin
   3. Under running water from a tap

6. Are you using any soap when washing dishes and utensils?
   * 1. Yes
   2. No

7. Do you sometimes try to protect your food from flies?
   * 1. Yes
   2. No

   If yes, why?_____
   How?_____

8. What do you think is the best treatment to decrease the frequency of diarrhea?
   1. Injections
   * 2. Cleanliness
   3. Local medicine

Hygiene, continued

9. How often do your children wash their bodies?	1. Every day 2. Twice a week 3. Once a week 4. Twice a month 5. Once a month 6. Other, specify
10. How often do you take a bath?	1. Every day 2. Twice a week 3. Once a week 4. Twice a month 5. Once a month 6. Other, specify
11. How often do your children put on clean clothes?	1. Every day 2. Twice a week 3. Once a week 4. Twice a month 5. Once a month 6. Other, specify
12. How often do you yourself put on clean clothes?	1. Every day 2. Twice a week 3. Once a week 4. Twice a month 5. Other, specify
13. How often do you wash your blankets?	1. Every month 2. Four times a year 3. Twice a year 4. Once a year 5. Other, specify
14. How often do you clean the floor in the kitchen?	1. Several times a day 2. Once a day 3. Once a month 4. Other, specify
15. How often do you clean the floor where you sleep?	1. Several times a day 2. Once a day 3. Once a week 4. Once a month 5. Other, specify

Employment/Special Skills

The next questions deal with employment and the help you get in household work.

1. Do you receive cash money for any work you are doing?	1. Yes 2. No

7 w

Employment/Special Skills, continued.

If yes, what type of work?

1. Selling own product
2. Employed

If selling own product, what type of product?_____

How much did you earn last year?_____

Family Service

Do you get any help with the following from family members who do not have meals together with you and people living outside the household?

If so, how often?

Help with	From family members who don't have meals together with you				From people living outside the household			
	D	W	M	Y	D	W	M	Y
Household work	___	___	___	___	___	___	___	___
Agricultural work	___	___	___	___	___	___	___	___
Herding cattle	___	___	___	___	___	___	___	___
Finding employment	___	___	___	___	___	___	___	___
Caring for children	___	___	___	___	___	___	___	___
House, building/maint.	___	___	___	___	___	___	___	___
Arranging social events	___	___	___	___	___	___	___	___

9 w
8 h

Reproduction

That children are born is important for families--let's discuss that for a while.

1. How long does it take for a baby to develop inside the mother before being born?
   1. Five months (22 weeks)
   * 2. Nine months (40 weeks)
   3. One year (52 weeks)

2. If the mother is in a general state of poor health, does that affect the baby before it is born?
   * 1. Yes
   2. No

9 w
8 h

Reproduction, continued.

3. How soon after giving birth can a woman become pregnant again?
   1. Immediately
   * 2. When the uterus has stopped bleeding
   3. When she has stopped nursing the baby

4. If the mother becomes pregnant while she is still nursing the last born baby, what will happen?
   1. The baby will be poisoned
   2. The fetus will be aborted
   * 3. The breast milk will disappear

5. Have you heard of any way to avoid having children too often?
   * 1. Yes
   2. No

   If yes, what?_____

   Have you used it yourself?
   1. Yes
   2. No

   If no, would you like to use something to avoid having children too often?
   1. Yes
   2. No

6. If only girls are born to a mother, what is that depending upon?
   1. The mother
   2. The father
   * 3. Both mother and father
   4. Other, specify

7. When is it likely that a woman gets pregnant?
   1. During her periods
   2. Just after a period
   3. Just before a period
   * 4. In between two periods
   5. Don't know

8. What do you think is a good time interval between pregnancies for a woman?_____

9. Who do you think would be most suitable to tell people about how to space children?_____

10 w

Child Care

1. What do you think is healthier for a baby, to be breast fed or bottle fed? Why?_____
   * 1. Breast fed
   2. Bottle fed

2. How long did you breast feed your last child?_____

3. At what age do you think a baby needs additional solid food to breast milk or cow's milk?
   1. Smiles at the mother or other family members (2 months)
   * 2. Sits up with support (3-4 months)
   3. Creeps and crawls (7-9 months)
   4. Walks (10-12 months)
   5. Other, specify

4. What is the first food of the following that should be introduced to a baby?
   1. Mealiemeal
   2. Eggs
   * 3. Fruit juice
   4. Greens
   5. Other, specify

5. If a child has diarrhea, what would you give it to drink?
   * 1. Boiled water
   2. Milk
   3. Sour milk
   4. Water and ashes

6. If the baby is bottle fed, how do you think the bottle should be cleaned?
   1. By your hand only
   2. With cold water
   3. With water and soap
   4. With hot water
   * 5. Boiled in water
   6. Other, specify

   How often?
   1. Never
   2. Some times
   3. Every day
   * 4. After meals

7. Do you think it is important to take a child to the clinic? Why?_____
   * 1. Yes
   2. No

   If yes, at what age should it be brought to the clinic?_____

8. Do you think play other than helping parents with work is important for a child's development?
   * 1. Yes
   2. No

   Why?_____

11 w

Nutrition

It is important that your family gets the right food. What opinions do you have about the following?

1. Who in the family do you think has the greatest need for nutrition? Rank in order:
   1. ___The wife
   2. ___The husband
   * 3. ___The wife when pregnant
   4. ___Children older than five years of age

2. What is the single most nutritive food item?
   1. Spinach
   * 2. Egg
   3. Bread
   4. Mealies

3. Which one of the following foods is the best body-building material?
   1. White bread
   * 2. Jugobeans
   3. Spinach
   4. Mealie-rice

4. Which one of the following foods is good for the blood?
   1. Milk
   * 2. Liver
   3. Sugar
   4. Bread

5. Which one of the following foods provides the most energy?
   * 1. Butter
   2. Jugobeans
   3. Cabbage
   4. Milk

6. Which one of the following foods is good in preventing infectious diseases?
   1. Bread
   * 2. Oranges
   3. Oil
   4. Milk

7. Which one of the following loses its food value first, if over-cooked?
   1. Eggs
   * 2. Cabbage
   3. Jugobeans
   4. Mealiemeal porridge

8. What would you add to porridge and beans to make the meal well-balanced?
   1. White bread
   * 2. Spinach
   3. Butter
   4. Meat

11 w

Nutrition, continued

9. Food consumption record

What food did you serve your family yesterday?
(Include beverages and snacks)

	B	P	E
Last night?			
	____	____	____
During the day?			
	____	____	____
In the morning?			
	____	____	____

Did you purchase any food yesterday? 1. Yes 2. No

If yes, what did you buy?_____

_____

How much did you pay?_____

APPENDIX B

GUIDANCE QUESTIONS FOR UNSTRUCTURED INTERVIEWS

APPENDIX B

GUIDANCE QUESTIONS FOR UNSTRUCTURED INTERVIEWS

1. How would you like your children to earn their living?
   Sons? Daughters? Why?

2. Where would you wish your children to live? Why?

3. How many children would you wish for them to have? Why?

4. What kind of house would you like for them to live in? Why?

5. Are there any special things you would like for them to get?
   Why?

6. Why is it good to have children?

7. How many children do you think a woman should have? A man?
   Why?
   Does it make any difference if they are boys or girls?

8. Do you think children should go to school? Why?

9. Would it be good to decide how many children one wants? Why?

10. Do you think it is possible to decide how many children one wants? Can a woman decide? Can a man decide?

    Who should decide? Why?

11. Do you think most women would like more children?
    Or less children? Why?

12. Do you think most men would like more children?
    Or less children? Why?

13. Do you think it would be good for Swaziland if more children were born? Or less? Or is it good like it is?

    Why?

14. If one of your children should be seriously sick, where would you go for help?

15. What is determining how many children people have?

16. What is the biggest expense of having children?

17. If you suddenly got a lot of money, what would you do?

18. What are the biggest problems you have?

APPENDIX C

MAP OF SWAZILAND

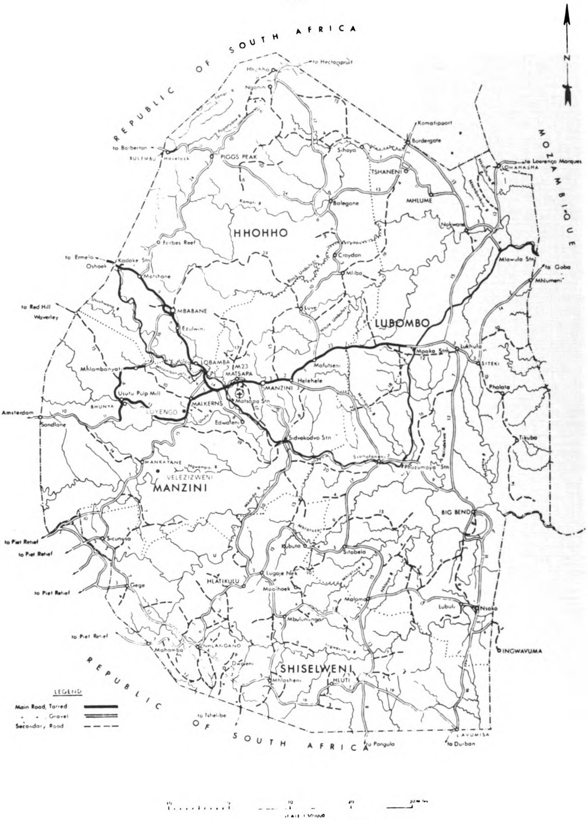

Figure 2.--Map of Swaziland

APPENDIX D

RESULTS OF ANALYSIS OF VARIANCE TESTS

TABLE 30.--Results of the Analysis of Variance Test for Desired Number of Children.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	127.4506	63.7253	4.4684	0.0130*
2	Age	2	7.0788	3.5394	0.2482	0.7805
3	Sex	1	31.1120	31.1120	2.1815	0.1418
Subclasses uncorrected		15	6,953.04	0.0000	0.0000	0.0000
Reduction (all constants)		6	6,821.3668	0.0000	0.0000	0.0000
Pooled interactions		9	131.6732	14.6304	1.0259	0.4221
Within subclasses		149	2,124.9600	14.2615	0.0000	0.0000
Total		163	9,078.0000	0.0000	0.0000	0.0000

*Indicates significance at .01 level.

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob > F
Model	2	117.4500	58.7250	6.2804	0.0078*
Error	15	7.0750	1.4700		
C. Total	17	124.5250			

TABLE 31.--Results of the Analysis of Variance Test for Desired Number of Children.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	113.0861	56.5430	4.0362	0.0197*
2	Sex	1	46.2348	46.2348	3.3004	0.0713
3	Number of children	2	31.2987	15.6494	1.1171	0.3300
Subclasses uncorrected		18	7,027.6934	0.0000	0.0000	0.0000
Reduction (all constants)		6	6,837.2640	0.0000	0.0000	0.0000
Pooled interactions		12	190.4294	15.8691	1.1328	0.3382
Within subclasses		146	2,045.3066	14.0089	0.0000	0.0000
Total		163	9,073.0000	0.0000	0.0000	0.0000

*Indicates signifcance at .01 level.

TABLE 31—Results of the Analysis of Variance Test for Selected Number of Children.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	113.0061	56.5030	4.0362	0.0182*
2	Sex	1	16.2248	16.2248	1.1591	0.2813
3	Number of children	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Subclasses	Income received	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Education (all creditors)		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Owned Occupation		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Within subclasses		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total		63	5,478.9000	87.0000	[illegible]	0.000

*Indicates significance at .01 level

TABLE 32.--Results of the Analysis of Variance Test for Ideal Number of Children.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	456.1103	228.0552	3.1766	0.0445
2	Age	2	27.5037	13.7519	0.1916	0.8258
3	Sex	1	66.0421	66.0421	0.9190	0.3390
Subclasses uncorrected		15	8,404.41	0.0000	0.0000	0.0000
Reduction (all constants)		6	7,973.5391	0.0000	0.0000	0.0000
Pooled interactions		9	430.8709	47.8745	0.6669	0.7378
Within subclasses		151	10,840.5900	71.7920	0.0000	0.0000
Total		165	19,245.0000	0.0000	0.0000	0.0000

TABLE 3A.—Results of the Analysis of Variance Test for Total Number of Children.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	484.1109	256.0868	3.1788	0.0468
	Age	2	21.5097	10.7613	0.1336	0.8694
2						

TABLE 33.--Results of the Analysis of Variance Test for Ideal Number of Children.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	448.5580	224.2790	3.1064	0.0477
2	Sex	1	100.5857	100.5857	1.3932	0.2398
3	Number of children	2	0.0908	0.0454	0.0006	0.9994
Subclasses uncorrected		18	8,568.5017	0.0000	0.0000	0.0000
Reduction (all constants)		6	8,014.5883	0.0000	0.0000	0.0000
Pooled interactions		12	553.9134	46.1595	0.6393	0.8059
Within subclasses		149	10,757.4983	72.1980	0.0000	0.0000
Total		166	19,326.0000	0.0000	0.0000	0.0000

TABLE 34.--Results of the Analysis of Variance Test for Population Attitude Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	86.4889	43.2445	6.8704	0.0014*
2	Age	2	10.3283	5.1642	0.8205	0.4421
3	Sex	1	66.9189	66.9189	10.6317	0.0014*
Subclasses uncorrected		15	13,819.68	0.0000	0.0000	0.0000
Reduction (all constants)		6	13,793.7148	0.0000	0.0000	0.0000
Pooled interactions		9	25.9652	2.8850	0.4584	0.9004
Within subclasses		154	969.3200	6.2943	0.0000	0.0000
Total	168	168	14,789.0000	0.0000	0.0000	0.0000

*Indicates significance at .01 level.

TABLE 35.--Results of the Analysis of Variance Test for Population Attitude Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	167.4063	83.7031	13.4309	0.0000*
2	Sex	1	96.4903	96.4903	15.4827	0.0001*
3	Number of children	2	18.9829	9.4915	1.5230	0.2214
Subclasses uncorrected		18	13,847.9467	0.0000	0.0000	0.0000
Reduction (all constants)		6	13,779.9919	0.0000	0.0000	0.0000
Pooled interactions		12	67.9548	5.6629	0.9087	0.5399
Within subclasses		151	941.0533	6.2321	0.0000	0.0000
Total		168	14,789.0000	0.0000	0.0000	0.0000

*Indicates significance at .01 level.

TABLE 5A--ANALYSIS OF THE ANALYSIS OF VARIANCE TABLE FOR POPULATION DISTRIBUTION SCORES.

Source of Variance	D.F.	Sum of Squares	Mean Square	F-Ratio	Level of Significance
Class	1	765.4000	85.7091	13.4299	0.00000
Area	7	36.4003	36.4003	16.4827	0.00074
Interaction (AxC)	3	0.1525	0.1525	0.1525	0.1525
Error	1	1.7777	0.0000		
Total	15				

*INDICATES significance at .01 level.

TABLE 36.--Results of the Analysis of Variance Test for Mean Population Attitude Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	9,667.0552	4,833.5276	6.2760	0.0039*
2	Mean number of children	1	249.7617	249.7617	0.3243	0.5718
Subclasses uncorrected		6	342,789.6937	0.0000	0.0000	0.0000
Reduction (all constants)		4	342,468.0102	0.0000	0.0000	0.0000
Pooled interactions		2	321.6835	160.8418	0.2088	0.8123
Within subclasses		46	35,427.3063	770.1588	0.0000	0.0000
Total		51	378,217.0000	0.0000	0.0000	0.0000

*Indicates significance at .01 level.

TABLE 37.--Results of the Analysis of Variance Test for Reproduction Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	4.2425	2.1213	2.6855	0.0714
2	Age	2	0.1027	0.0514	0.0650	0.9371
3	Sex	1	8.1571	8.1571	10.3269	0.0016*
Subclasses uncorrected		15	1,323.35	0.0000	0.0000	0.0000
Reduction (all constants)		6	1,291.7993	0.0000	0.0000	0.0000
Pooled interactions		9	31.5501	3.5056	4.4380	0.0000*
Within subclasses		154	121.6500	0.7899	0.0000	0.0000
Total		168	1,445.0000	0.0000	0.0000	0.0000

*Indicates significance at .01 level.

Table 3. Number of Patients by Number of Hospitalizations and Length of Stay

Number of Hospitalizations	Number of Patients	Total Days	Mean Days	Standard Deviation	Minimum	Median	Maximum
1	1,000	5,000	5.0	3.0	1	4	15
2	500	3,000	6.0	3.5	1	5	18
3	250	1,800	7.2	4.0	2	6	20
4 or more	100	800	8.0	4.5	2	7	25
Total	1,850	10,600	5.7	3.8	1	4	25

Note: Data are hypothetical.

TABLE 38.--Results of the Analysis of Variance Test for Reproduction Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	2.6737	1.3368	1.6739	0.1910
2	Sex	1	9.0364	9.0364	11.3147	0.0010*
3	Number of children	2	3.0597	1.5298	1.9155	0.1508
Subclasses uncorrected		18	1,324.4054	0.0000	0.0000	0.0000
Reduction (all constants)		6	1,319.7369	0.0000	0.0000	0.0000
Pooled interactions		12	4.6684	0.3890	0.4871	0.9199
Within subclasses		151	120.5946	0.7986	0.0000	0.0000
Total		168	1,445.0000	0.0000	0.0000	0.0000

*Indicates significance at .01 level.

TABLE 39.--Results of the Analysis of Variance Test for Hygiene Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	23.6128	11.8064	5.0178	0.0086*
2	Age	1	7.9187	7.9187	3.3655	0.0699
Subclasses uncorrected		6	1,747.2389	0.0000	0.0000	0.0000
Reduction (all constants)		4	1,733.6780	0.0000	0.0000	0.0000
Pooled interactions		2	13.5609	6.7804	2.8817	0.0612
Within subclasses		90	211.7611	2.3529	0.0000	0.0000
Total		95	1,959.0000	0.0000	0.0000	0.0000

*Indicates Significance at .01 level.

TABLE 40.--Results of the Analysis of Variance Test for Child Care Score.

Class	Source of VVriance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	0.3209	0.1604	0.1031	0.9021
2	Age	1	0.2618	0.2618	0.1683	0.6826
Subclasses uncorrected		6	2,715.9933	0.0000	0.0000	0.0000
Reduction (all constants)		4	2,709.9835	0.0000	0.0000	0.0000
Pooled interactions		2	6.0099	3.0049	1.9317	0.1509
Within subclasses		90	140.0067	1.5556	0.0000	0.0000
Total		95	2,856.0000	0.0000	0.0000	0.0000

TABLE 41.--Results of the Analysis of Variance Test for Nutrition Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	11.0229	5.5114	2.7515	0.0693
2	Age	1	0.2894	0.2894	0.1445	0.7048
Subclasses uncorrected		6	1,089.7284	0.0000	0.0000	0.0000
Reduction (all constants)		4	1,088.9643	0.0000	0.0000	0.0000
Pooled interactions		2	0.7641	0.3820	0.1907	0.8267
Within subclasses		89	178.2716	2.0031	0.0000	0.0000
Total	94	1,268.0000		0.0000	0.0000	0.0000

TABLE 42.--Results of the Analysis of Variance Test for Farm Practice Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	92.2145	46.1072	5.5805	0.0057*
2	Age	1	1.1685	1.1685	0.1414	0.7081
Subclasses uncorrected		6	1,119.4323	0.0000	0.0000	0.0000
Reduction (all constants)		4	1,118.7399	0.0000	0.0000	0.0000
Pooled interactions		2	0.6923	0.3462	0.0419	0.9590
Within subclasses		67	553.5677	8.2622	0.0000	0.0000
Total	72	1,673.0000		0.0000	0.0000	0.0000

*Indicates significance at .01 level.

TABLE 43.--Results of the Analysis of Variance Test for Utilization Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	1,262.6950	631.3475	3.7544	0.0285
2	Age	1	424.9189	424.9189	2.5268	0.1167
Subclasses uncorrected		6	158,329.0958	0.0000	0.0000	0.0000
Reduction (all constants)		4	158,003.0082	0.0000	0.0000	0.0000
Pooled interactions		2	296.0877	148.0438	0.8804	0.4194
Within subclasses		67	11,266.9042	168.1627	0.0000	0.0000
Total		72	169,596.0000	0.0000	0.0000	0.0000

TABLE 44.--Results of the Analysis of Variance Test for Income.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	123.2501	61.6251	13.7968	0.0000*
2	Age	1	12.1858	12.1858	2.7282	0.1033
Subclasses uncorrected		6	1,424.2026	0.0000	0.0000	0.0000
Reduction (all constants)		4	1,421.3763	0.0000	0.0000	0.0000
Pooled interactions		2	2.8264	1.4132	0.3164	0.7299
Within subclasses		66	294.7974	4.4666	0.0000	0.0000
Total		71	1,719.0000	0.0000	0.0000	0.0000

*Indicates significance at .01 level.

TABLE 45.--Results of the Analysis of Variance Test for Resourcefulness Score.

Class	Source of Variance	D.F.	Sum of Squares	Mean Square	F-Value	Level of Significance
1	Area	2	5,697.4463	2,848.7231	1.6264	0.2077
2	Mean number of children	1	555.8563	555.8563	0.3173	0.5759
Subclasses uncorrected		6	2,956,452.7033	0.0000	0.0000	0.0000
Reduction (all constants)		4	2,955,550.9321	0.0000	0.0000	0.0000
Pooled interactions		2	901.7712	450.8856	0.2574	0.7742
Within subclasses		46	80,572.2967	1,751.5717	0.0000	0.0000
Total		51	3,037,025.0000	0.0000	0.0000	0.0000

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