POPULATION AND NUTRITION IN BURUNDI, RWANDA AND ZAIRE

Problems and Recommendations

Submitted by

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A. INTRODUCTION

According to various recent estimates (reported by Haub and Heisler 1980), the total population of Burundi reached 4.5 million persons in 1980; of Rwanda, 5.1 million; and of Zaire, 29.3 million. These increases are the result of rapid population growth, itself a function of an excess of births over deaths. Among the reasons for declining mortality (which nonetheless remains higher in these three countries than in Africa as a whole) are the advent of antibiotics, immunizations, and insecticides; campaigns against such fatal diseases as smallpox; improvements in health; and the disappearance of major famines. At the same time, fertility is high because of improvements in nutrition and the decline of certain diseases, increasing many women's fecundity.[1] Moreover, in recent years there has been a weakening of some sexual taboos (for example, during breastfeeding, among adolescents, and after the death of a member of a family or of a king), with neither the means nor the motivation to prevent conception. In sum, rapid population growth in many instances in the Great Lake countries has resulted not only from a reduction in the subtraction of persons due to death, but also from ever-increasing numbers of young people surviving to the reproductive years, during which time they have large families.

1/ The physiological capacity to give birth.

There are several undesirable consequences of this rapid population increase. At the individual level, frequent pregnancies create health and nutritional problems for mothers and children: complications of pregnancy, prematurity, spontaneous abortion, and an insufficient milk supply. At the aggregate level, rapid growth diverts resources which could otherwise be used for investment in development; it creates a very large force, particularly among young people who are at special risk of unemployment; and it causes strains in such public services as education, health, sanition, and transportation. Furthermore, a high population density creates heavy pressures on natural resources, especially the food supply. In Burundi, Rwanda, and Zaire a rapidly growing population reduces fallow time and the adoption of soil conservation measures. Declines in soil fertility and the size of the average farm result. Eventually, population size begins to outstrip food supplies, with a resulting deterioratior of nutritional status.

The objective of this report is to document the current demographic picture of Burundi, Rwanda, and Zaire and, as an example of one of the most serious consequences of rapid population growth, the problem of food supply and nutrition. It will describe some of the principal demographic and nutritional concerns, and discuss research findings on family planning and women's status in the region. Some of the policies and programs designed to reduce high fertility and to improve nutritional levels will then be identified. Finally, the report makes recommendations for improving the population-food situation. There are many more similarities than

differences in the characteristics of and the problems facing the three countries; for this reason several regional approaches can be envisaged.

B. OBSERVATIONS

1. NATIONAL-LEVEL DEMOGRAPHIC DATA

a. Mortality (Tables 1a, 1b)

Although rates for the three countries have recently declined, mortality (reported by Haub and Heisler 1980) still remains higher in Burundi, Rwanda and Zaire than in most other Third World countries, even Africa. The crude death rate[1] is 20 in Burundi and 19 in Rwanda and Zaire. (It is 17 in Africa as a whole, and only 9 for the entire developed world.)

Expectation of life[2] is lower in Burundi (45 years) than in Rwanda or Zaire (46), and is consistently lower for men than for women (Haub and Heisler 1980). In Rwanda from 40 to 60% of all deaths occur to children under six years; 65% of all infants die during the first three months of life, and 73% before six months (Republique Rwandaise 1973). Although life expectancy is expected to continue to increase, it is likely that the rate of such an increase will soon slow. The principal reason is that control of the major causes of children's mortality (dysentery, diarrhea and

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1/ The number of deaths per 1,000 persons.

2/ The average number of years that a person can expect to live, based on age-specific mortality rates in a given year: a hypothetical measure (not a rate) and an indicator of current health conditions.

pneumonia) requires not only modern medical measures but also improvements in the standard of living, particularly nutrition and education (van der Tak, Haub and Murphy 1979). Demographic projections do indicate a continuation of mortality declines. Yet the question remains, posed by the authors of a recent report on this subject (van de Walle and Knodel 1980): can recent declines in mortality continue in the face of a worsening standard of living caused by rapid population growth?

The infant mortality rate (Haub and Heisler)[1] is higher in Zaire (160) than in Burundi (140) or Rwanda (127), with higher figures for boys than girls (Haub 1980). (For Africa as a whole, this figure is 143; for the developed world, only 28.) It is likely that Rwanda's superior health system accounts for that country's relatively low rate, a strong measure of a nation's health. More detailed data from Rwanda reveal that mortality is higher in rural than in urban regions (Republique Rwandaise 1973; Sirven, Gotanegre and Prioul 1974; Vis, Yourassowsky and Van Der Borght 1975), while life expectancy is higher among those living on the paysannats than elsewhere (Morris 1979). One study found the infant mortality rate lower among the Tutsis than the Hutus (Vis, Yourassowsky and Van Der Borght 1975).

1/ The number of deaths to infants under one year of age per 1,000 births.

b. Fertility (Tables 2a, 2b)

The crude birth rate (Haub and Heisler 1980)[1] is very high in all three countries. The average for all Third World countries is 32; the developed world, 16. In contrast, Rwanda has a rate of 50; Burundi, 47; and Zaire, 46. (Kivu's rate (Boute and de Saint Moulin 1978) is 52 per 1,000.) The total fertility rate[2] is also the highest in Rwanda with 6.9, in contrast to 6.3 in Burundi and 6.1 in Zaire (Haub 1980). Still, recent projections (United Nations 1979) show a sizeable reduction in the crude birth rate and total fertility rate by the year 2000. In Rwanda, fertility is higher among the Hutus than the Tutsis (Vis, Yourassowsky and Van Der Borght 1975; Adegbola 1977), and higher in rural areas than in cities (Republique Rwandaise 1973; Vis, Yourassowsky and Van Der Borght 1975).

Detailed regional information for Zaire shows that fertility is higher in North Kivu than in South Kivu (Gitebo 1978). The author of this report finds that in moving west one observes lower levels of fertility, the result, he contends, of large numbers (40% of all women in Kibombo and Kindu) of sterile and infecund women. He reports the following sub-regional rates of sterility: 6.3% (South Kivu), 5.3% (North Kivu), and 27.1% (Maniema), the latter most likely the result of venereal disease. Rwanda appears to have

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1/ The number of births per 1,000 population.

2/ The average number of children who would be born if a woman passed through all her childbearing years conforming to the age-specific fertility rates of a given year.

the lowest sterility rates of the three countries, with only 3% (Republique Rwandaise 1973). While a rate of only 5.3% is found in Bubanza in Burundi (Robatel et al 1974), the authors of this study report it to be higher in regions where gynecological infections and/or polygamy are commonplace.

c. Migration

Because numerical data on migration are difficult to obtain and rarely reliable, emphasis in this section is on the types of and reasons for migration, as well as some of its implications for socio-economic development.

° International Migration

Beginning in around 1940, Burundi and Rwanda experienced tremendous out-migration to Zaire, particularly between 1940 and 1944. In fact, the two countries actually lost population at that time (Rwanda, at an annual rate of 5% and Burundi, 0.1%). Zaire's 1970 census revealed the presence of 335,000 Rwandans, the vast majority of whom were living in North Kivu (Wils, Carael and Tondeur 1976). This phenomenon may at least partly explain Kivu's exceptionally high population density.

A description of international migration among the three Great Lake countries given in a recent report (Gatanzi 1978a) outlines Rwanda's "Mission Immigration Banyarwanda," the resettlement of persons to Kivu which began in 1936, owing to high population density, soil degradation, chronic economic difficulties, and natural

disasters. Because families leaving the country had no land to give to others, few advantages accrued to Rwanda from this policy. In contrast, Zaire benefitted enormously by virtue of the sizeable labor force it acquired. A second major exodus of Rwandans occurred between 1959 and 1964. During this time approximately 100,000 political refugees poured into northeast Burundi and 60,000 to eastern Zaire (Gatanzi 1978b).

° Internal Migration

In Burundi, a large proportion of in-migrants to Bujumbura are youths who are unemployed, illiterate, and lacking any incentive to remain on their colline. This phenomenon is apparently less marked in Rwanda, at least in Kigali, where a recent survey (Nsanzabaganwa and Back 1977) found that it was primarily young men with higher-than-average schooling who migrated there. In Zaire, the years 1968 and 1970 (the most recent date for which data are available) were marked by an excess of migrants to, over births in, Bukavu (Republique du Zaire 1974).

Two kinds of migration occur in Rwanda: seasonal migration (whereby peasants leave their farms during the dry season to return during the rainy season), and more or less permanent migration. The authors cited above (Nsanzabaganwa and Back 1977) found that, with respect to the second type of migration to Kigali,

° The hypothesis that such activities as pre-cooperative arrangements can serve as alternatives to migration was not verified;

- migration to Kigali was lower than to agricultural regions or even to other countries; and
- family ties were apparently so strong that they prevent most youths from leaving their farm. (A majority of Rwanda's population lives in the prefecture of birth.)

A tendency in recent years is an increase in migration to those areas of Rwanda where land remains available, and a decrease in the flow to Kigali and other urban centers. In the absence of hard data, it can be postulated that, owing to the reluctance of most Rwandans to move, it is the most impoverished peasants who are motivated to leave their farm.

Figures on migration in Kivu show that 71.4% of those persons who move elsewhere are men, a ratio higher than that of other regions in Zaire except Haut-Zaire (Boute and de Saint Moulin 1978). Similarly, a recent synthesis of information on migration in the developing world (Youssef et al 1979) found that it is primarily men who migrate from rural areas of Rwanda, particularly in the 20-34 age group. But in contrast, among the very young (15-19) and those over 45 years, migrants tend to be women. The authors interpret the latter finding as the propensity of widows, divorced or separated women(who find themselves without economic support in a rural milieu) to conclude that they would be better off to leave their residence.

d. Population Growth (Tables 3a, 3b)

The annual rate of natural increase[1] is extremely high in Burundi, Rwanda and Zaire. Rwanda's is the highest: at least 3% a year, with 2.7% in Burundi and 2.8% in Zaire (Haub and Heisler 1980). At these rates, the population of Rwanda will double in less than 23 years, and those of Burundi and Zaire, in 25 years. The population of Kivu is higher than that of any of Zaire's other regions (Boute and de Saint Moulin 1978). The principal reasons for such rapid growth in the three countries are:

- recent mortality declines;
- a large number of young men and women just reaching their childbearing years; and
- very high completed fertility rates.[2]

Taking migration into account, one finds that in Rwanda the prefectures with the most rapid recent growth have been Kigali, Byumba, Kibungo and Kibuye. In Zaire, North Kivu recently experienced an annual increase of 4.2%. According to one report (Gitebo 1978), the populations of Goma and Beni doubled between 1950 and 1970, and that of Rutshura tripled, principally because of immigration. In South Kivu, Kalehe doubled in population during that

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1/ The difference between the number of live births and the number of deaths occurring in a given year, divided by the average population and normally multiplied by 1,000; the difference between the crude death and birth rate, which does not take into account the effects of migration.

2/ The number of children actually (as opposed to hypothetically) born per woman in a cohort of women by the end of their childbearing years.

time; its annual growth of 2.4% between 1960 and 1970 was partly due to the immigration of Rwandans. Of the three sub-regions of Kivu, Maniema has witnessed the slowest population growth.

Recent projections (United Nations 1969) reveal that in Burundi and Rwanda the rate of growth will actually increase in the short run and then decrease somewhat; in Zaire, applying the medium variant results initially in a decrease in the rate, with an even greater reduction between 1995 and 2000. An important correlate of this growth is the factor of population momentum, which describes the phenomenon whereby a high rate of growth not only adds many persons at the present time but also creates the potential for a large number of births later on. In all three countries, because of high fertility in recent years, the number of young people approaching the age of childbearing is very great, greater than that of the population in the older age groups. (In all three countries, from 44% to 47% of the population is under 15 years. See Section 2.B.g, below.) As a result, even if individual fertility were immediately reduced, the growth of population would continue for many years. Indeed, attainment of a stationary population[1] in the year 2160 (United States Agency for International Development 1980) would still mean populations about 4 1/2 times larger than at present.

1/ A population with both a zero growth rate (because the birth rate equals the death rate) and an unchanging age composition.

e. Population Density (Table 4)

While Zaire as a whole has only 11 persons per square kilometer (United States Agency for International Development 1980), Kivu is very densely populated: in South Kivu, the regions of Walungo and Ikoma have 180 and 250 persons per square kilometer respectively (Kabamba and Miatudila 1980). Rwanda, the population of which is the densest in Africa, has approximately 170 inhabitants per square kilometer, with Burundi having a figure of around 150 (United States Agency for International Development 1980). However, to arrive at a figure reflecting density per arable land unit, areas unfit for cultivation, as well as lakes, forests and national parks, marshes, roads, rivers, military property and game parks, and research stations must be excluded. By these calculations, only about one-half Rwanda's surface area can be used for traditional agriculture.

In Burundi, the most densely populated regions are the mountainous and hilly regions: Bujumbura, Ngozi, Muramvya and Gitega. In contrast, Bubanza and Muyinga (in the north) and Ruyigi and Bururi (in the south and east) are more sparsely populated. In Kivu, it is South Kivu which has the highest average density, followed by North Kivu and then Maniema. In Rwanda, the most densely populated prefectures are Butare, Ruhengeri and Gitarama; Byumba and Kibungo, the least; and Kigali, Gisenyi, Kibuye, Cyangugu and Gikongoro fall in between. The author of a study of the land situation in Rwanda (Prioul 1976) predicts that the country's density will be 216 inhabitants in 1985. In the course of showing

that Rwanda's average density doubled between 1948 and 1970, he concludes that "the exception has become the rule."

f. Urban-Rural Distribution (Tables 5a, 5b)

The percents urban (Haub and Heisler 1980) in Burundi (5%) and Rwanda (4%) are among the lowest in the world: the figure for Third World countries is 69%; for Africa as a whole, 26%. It is higher in Zaire (30%), but only 16% in Kivu (Boute and de Saint Moulin 1978).

In Burundi, Bujumbura is the only province with any degree of urbanization, for more than 65% of the entire urban population lives there (Republique du Burundi 1978). Furthermore, in all of Burundi only two cities exist (Bujumbura and Gitega); in the provinces of Ngozi, Muramvya, Bururi, Ruyigi, Bubanza and Muginga there are only "bourgs" or other population groupings which do not necessarily have any infrastructure. The authors of the migration study cited above (Nsanzabaganwa and Back 1977) attribute Rwanda's lack of urbanization to, among other factors, the dearth of administrative or commercial centers existing prior to independence, and that country's lack of access to the ocean, traditionally the logical basis for industrial and commerical development in other African cities.

The possibility exists, according to projections by the University of Chicago (Tsui 1979) that in the year 2000 Rwanda's percent urban will be around 10%; Burundi's, 8%; and Zaire's, more than 45%. Rwanda's rate of urban growth is expected to be much

higher (500% between 1975 and 2000) than that of the other two countries. Projections in all three are for the rate of rural growth between 1975 and 2000 to be lower than that of urban growth. Here, too, Rwanda's rate (approaching 100%) is projected to exceed Burundi's and Zaire's.

g. Age Composition (Tables 6a, 6b)

For all three countries nearly one-half the population is under 15 years old. The percent young (Haub and Heisler 1980) is the highest in Rwanda: 47% of the population is 14 or younger. The projection for the year 2000 (United Nations 1979) is that this percentage will decline somewhat in the entire region, especially in Zaire. Nevertheless, the number of youngsters will grow enormously (McHale et al 1979); in Rwanda, this number is expected to increase by 100% between 1975 and 2000.

The age-dependency ratio[1] is an indicator of the burden born by "productive" persons, that is, those of working age. In Rwanda, for example, for every 100 persons of working age, there are approximately 100 persons in the dependent age groups (under 15, and over 64), with figures of 92 and 85 for Zaire and Burundi, respectively. Countries which have recently experienced high fertility have high age-dependency ratios, because of the very large number of children in the population.

1/ The ratio of persons in the "dependent" age groups (less than 15 years and more than 64 years) to those of the "economically productive" age groups (15-64 years).

h. Summary

In conclusion, it has been shown that throughout the Great Lakes region fertility and population growth are and will continue for some time to be exceptionally high. The proportion of children is important not only as a result of high fertility but also as a cause of rapid growth. Although urbanization is expected to increase, Burundi, Rwanda and Kivu remain primarily rural; at the same time, however, their population density is becoming extraordinarily high.

2. FOOD AND NUTRITION (Tables 7, 8)

a. Food Production and Supply

Although Table 7 (United States Agency for International Development 1980) shows that the per capita food supply is somewhat better in Burundi and Rwanda than in Zaire, in the face of mounting population pressures all three countries are facing growing problems of food production and supply. Furthermore, national averages are not only to be viewed cautiously because of various difficulties with data, but also give an incomplete picture. In order to understand the degree to which the need for foods and nutrients is being met, such characteristics as earnings (which influence the ability to pay for food), the distribution of food among family members, and individual nutritional needs must be determined.

In Burundi total production is not now a problem, but there are several reasons why many observers expect it to soon become serious. That country's national development plan of 1978-1982 probably exaggerated the consumption of calories from manioc. It also overlooked the fact that 1977 was a particularly favorable agricultural year, did not take into account post-harvest losses, and used total figures which disguised regional shortages and surpluses. In Rwanda, several regions are beset by severe soil degradation. According to an agricultural sector report (Morris 1979), total production per inhabitant increased recently for sweet potatoes, manioc, potatoes, and maize; at the same time, the production of beans, bananas, sorghum and peas declined. If present

levels continue, Rwanda's domestic production will soon fall far short of its population's food needs. In any event, even for those products the production of which has increased, per capita output is, because of rapid population growth, increasing rather slowly.

b. Nutritional Status: Principal Problems and their Causes

An analysis of nutritional status in Zaire (Lashman 1975) identifies some of the principal causes of malnutrition in that country. Although Zaire fares perhaps the worst of the three countries (particularly if one concentrates on Kivu), several issues identified in that summary apply to all three Great Lake countries, particularly the relationship between population growth and malnutrition.

The first basic cause is a lack of adequate food. In Zaire the reduced farm-to-market transportation, pricing policies and disincentives which result in declines in agricultural output, and rapid growth and unequal distribution of population have all contributed to this problem. A second cause of malnutrition in the three countries is the inferior quality of the soil and of agricultural technology. In Kivu, transport difficulties and limitations on the food industry mean that food often spoils. For the entire region, over-grazing and declining fallow periods also cause production declines. And where there is much stock-farming, cattle compete with other sources of food for scarce land.

A third reason is low income and the lack of an integrated monetary economy. In Zaire, zairianization and inflation have placed many foods beyond the reach of the typical farmer. Although Burundi's 1978-1982 development plan strongly emphasizes rural development and increases in food production, agricultural producers at present have no credit system. In contrast, a national survey in Rwanda (Vis, Yourassowsky and Van Der Borght 1975) revealed an association between increased income and food consumption on the paysannats or in cities. For example, in Kigali and Butare, both income and diet were, according to this study, superior to those of other regions, and there were fewer fluctuations in the food supply than elsewhere. And although some traditional food practices existed, in contrast to many of the agricultural areas, people drank a good deal of milk and ate numerous animal products and fats.

A fourth reason for inferior nutritional levels is the type of diet resulting from certain social customs and taboos, and from ignorance concerning basic nutritional needs. According to Table 8 (Tsui 1979), in Burundi and Zaire protein sources (nuts, pulses, meats, fish, milk, eggs) are concentrated in the middle and bottom of the list of foods (ranked by their contribution to total calories in the diet), resulting in an imbalance in favor of carbohydrates and a lack of protein. Kwashiorkor is often the result.
In these two countries one rarely consumes fresh milk, eggs, poultry, goat meat or beans; maize and peanuts provide most protein. One study found that the consumption of manioc (which contains very little protein) had in the early 1970's largely replaced sorghum,

and that while fats should furnish at least 25% of one's calories, this figure was less than 5% (Republique du Burundi 1973).

In Rwanda banana and sorghum beer are popular items. One rarely eats fish, and many Rwandans believe that goat's milk should only be consumed by malnourished infants. Similarly, in Burundi, where a typical diet consists of maize, beans, sweet potatoes, manioc, bananas, milk, and banana beer, the greatest deficiencies are of oils and butter, soybeans, animal products, and fruits and vegetables. One values cattle for the status and wealth they bring; meat is considered a food only for the rich and/or to be served at feasts. Certain ways of preparing food can also have undesirable nutritional effects. For example, beans are often cooked too long, thus losing thiamine. Other harmful practices are excessive soaking and cooking of meat; discarding water containing valuable nutrients; and the mixing of manioc with insufficient water, creating a very heavy paste which is difficult to digest.

A study of nutrition in the Kivu Montagneux region of Zaire (Wils, Carael and Tondeur 1976) identified the first cases of kwashiorkor (reported in 1951) and its increase in incidence to 5% of the population of that region by 1966. The authors believe that a heavy concentration of manioc and sweet potatoes, as well as a decline in the importance of sorghum during the Belgian administration in 1920-1930 are the principal reasons for this situation. Still another nutritional study in Kivu (Mutima 1976) found that, while 0.5% of all children under 14 in Kabare, Walungu and Ikoma suffered

from malnutrition in 1959, this figure had increased to 2.5% by 1965. Even more recent research (Kabamba and Miatudila 1980) found that most of the problems of North Kivu were less severe than in South Kivu, where they identified a "hyper-endemic" of kwashiorkor. In 1978 there were 3,232 cases of this deficiency disease in Walungu, which witnessed a prematurity rate of 6.5%. According to maternity hospitals around Lwiro, the average birth weight is 2,600 grams, down from 2,900 grams a few years previously. (Birth weight under 2,500 grams is one definition of prematurity.)

A final cause of malnutrition in Burundi, Rwanda and Zaire is excessive morbidity. Certain infectious and parasitic diseases (principally measles and gastro-enteritis) are associated with a malabsorption of nutrients, which in turn increases nutritional needs among the already malnourished. Typical reasons include water unfit for drinking, inadequate health services, lack of medical supplies, and unsanitary and crowded housing which spawn water-, rodent- and insect-borne disease. Low birth weight and numerous closely spaced pregnancies, and early weaning are also implicated in malnutrition.

c. Some Programs in Kivu

Programs established in the Kivu region of Zaire are worthy of note because of all three countries, the nutritional problems are perhaps the most serious and the best understood here. The Anti-Bwaki Committee directs 45 nutritional centers to treat and examine malnourished children; teach nutrition principles (especi-

ally the causes of "bwaki", or kwashiorkor), food preparation, and hygiene; and sell soy flour. This committee conducts a campaign to educate the public concerning the values of soybeans and their use in meal preparation. Other activities include:

- experimenting with and determining the best varieties of soybeans for the region;
- establishing centers to produce and mill soybeans and to distribute seeds;
- increasing the production of sorghum and maize;
- converting non-tillable areas into fish ponds; and
- considering the production of a local weaning food.

3. WOMEN'S STATUS (Table 9)

a. General Position, Marriage

In all three countries women's status, which has an important bearing on both fertility and national development, is markedly inferior to that of men. Examples range from women's reluctance to express an opinion, to their tendency to marry and begin child-bearing rather than complete education or training upon which they have embarked. A recent study of Rwandan women (Gakwaya and Kameya 1979) learned from both male and female respondents (most having at least a primary-level education, and working in the agricultural sector) that husbands made most of the family's decisions about the children's education and household purchases. According to the authors of this report, one of the greatest barriers to improved women's position is their own feeling of inferiority.

Although marriage statistics for the region have not been obtained, it is known that polygamy often occurs in the following situations:

- a wife who has given birth only to girls is replaced by another wife;
- a wife who becomes old, sick or weak is replaced by a younger wife; and
- a man with more than one parcel of farm land needing cultivation takes more than one wife.

Polygamy in Rwanda, officially proscribed during the 1960's, is less commonly found on the paysannats than elsewhere. According

to one sociological study (Robatel et al 1974), many Burundian women believe that because it encourages infidelity and child neglect, polygamy should be outlawed. Likewise, the survey cited above (Gakwaya and Kameya 1979) disclosed that most respondents, male and female alike, believed that it upsets family harmony and prevents adequate child rearing. A few favored it, though, because it enables a husband to increase his income, and because it affords a solution to the problem of a first marriage in which the wife is unable to bear children.

b. Education

Notable male-female differentials exist with respect to literacy. In Burundi, while 21% of all men are literate, only 7% of all women are. In Rwanda the figures are 24% and 9% respectively; in Zaire, 49% and 14% (Haub 1980). Greater school attendance figures for males are the most pronounced in Zaire. In that country the number of women graduating from the National University (UNAZA) increased from only one in 1963 to 159 in 1973 -- yet by that latter date women still constituted only around 4% of the student population.

c. Employment

In each of the three countries more than 40% of the workforce consists of women; and more than 90% of all Burundian, Rwandan and Zairois women who work do so in the agricultural sector (Haub 1980). In most rural areas of Burundi, the female labor force is higher

than that of the men, with the opposite the case in cities. Rwandan women (Morris 1979) predominate in coffee production (70% of these workers are women), food harvests (79%), domestic activities (90%), food processing (95%), and manual labor (99%). Perhaps 30% of all rugos in Burundi are directed by women, the result of both widowhood and many men's departure to seek work elsewhere. Throughout the Great Lakes region, elderly women in particular are responsible for the types of food chosen, produced, prepared and included in the family diet; younger women are especially likely to care for children and do housework.

4. FAMILY PLANNING: SOME SURVEYS AND THEIR FINDINGS

a. Knowledge

Most of the sociological literature concerning the level of knowledge about reproductive physiology and family planning in the Great Lakes region comes from Burundi. According to one study (Robatel et al 1974), fewer than 20% of all women in Bubanza and Ngozi knew when conception occurs or how long it takes for a woman to become pregnant again after childbirth. 74% of the women were unaware of any contraceptive method; among the 26% who knew of at least one, 89% cited abstinence. Women interviewed in Ngozi were better informed than were those in Bubanza, a finding perhaps related in some way to the existence of a maternity hospital in the former province, as opposed to only a dispensary in the second. In Rwanda the study of women's status cited above (Gakwaya and Kameya 1979) revealed a general ignorance of family planning. However, men and women who were informed about such methods favored their use, which they felt would allow them to determine the number of children they had and therefore better devote themselves to their children's upbringing and education.

b. Attitudes

Here, too, Burundi provides most of the data on attitudes toward family planning. Another study (Navas et al 1977) disclosed that the desired family size was high, around 8.5 children. In the other Burundian survey on this subject (Robatel et al 1974),

which found a desiredfamily size of more than seven among 65% of the women interviewed in Bubanza and Ngozi, 49% of the women in Bubanza and 67% of those in Ngozi believed that their husband would accept child spacing. These authors concluded that many persons favor large numbers of children yet at the same time want ample birth intervals. Indeed, 42% of the women interviewed in Bubanza and 54% of those in Ngozi were interested in learning how to space their pregnancies. It is likely that existing medical-social centers and the information they provide operated in some way to influence the women's attitudes. Characteristics associated with this enthusiasm were:

- literacy, particularly among women 15-34;
- marriage to a husband who worked outside the agricultural sector;
- active women's groups;
- a solid health infrastructure; and
- a history of short birth intervals.

While 65% of all teenagers wanted at least seven children, they tended to be more interested in receiving information than were the older married women. Most women in these two provinces preferred to receive family planning information in a hospital or dispensary, in order to assure privacy from one's husband, friends or neighbors. Although the majority wanted to see a nurse or social worker rather than a doctor, the better educated women preferred a doctor working in a hospital.

A small survey of some of the branches of Zaire's family planning organization, the National Committee for Desired Births, found the following unfavorable attitudes toward this program: that it violated the natural inclination to reproduce, and that contraception causes sterility, immorality and prostitution. Favorable attitudes emerged as well, however: that the program was a useful one, concerning which greater publicity was warranted, and that greater emphasis should be placed on sex education for youth.

In Rwanda a survey of married schoolteachers (Sledsons 1971) found that 26% were in favor of practicing family planning. While the most frequently cited desired family size was six children, those informed about the problems of rapid population growth and some of the means to resolve them wanted to limit that number to four. From a nutrition survey conducted in Gisenyi (Godding 1980) it was learned that the average desired family size was somewhat higher among men (7.8 children) than among women (7.5). The finding that the desired number was considerably lower in densely populated areas than elsewhere, led the author to conclude that the former residents were particularly aware of demographic problems. Similarly, the authors of the Rwandan study of women's status cited above (Gakwaya and Kameya 1979) observed that the Rwandan people, in becoming more and more aware of the problem of overpopulation, often wonder what the country's population increase will mean for their children.

Many Rwandan women believe that injections are generally more effective in affording protection or providing a cure than are other medical methods. It is likely, therefore, that they favor Depo-Provera as a contraceptive method over the pill, although data to this effect have not been collected. Most men and women interviewed in one of the surveys cited above (Gakwaya and Kameya 1979) condemned abortion as a serious offense.

c. Practice

Only 4% of those interviewed by Robatel et al (1974) had practiced some form of contraception in order to space their pregnancies. According to the other Burundian study (Navas et al 1977), couples were especially likely to practice contraception when conjugal roles were relatively equal. The influence of literacy is striking: among those who had at least five years of schooling beyond the primary level, 95% of the women and 98% of the men accepted contraception. (In contrast, among the illiterate, only 45% of the women and none of the men were in favor of its use.) As of several years ago the incidence of abortion, previously rather low, was found to be on the increase in Bujumbura (Robatel et al 197[illegible]).

Responses by 29 of the 90-odd branches of Zaire's National Committee for Desired Births to a recent survey it conducted (CNND 1978) give an idea of some family planning practices in that country. The typical woman accepting contraception had had many children, was married, had received at least a primary level education, and

gave medical reasons for wanting contraception. While it has been reported (Kalonji 1978) that Depo-Provera is the most popular method in Zaire, this survey found the pill to merit that description (chosen by 48.5% of all women); in descending order, other preferred methods were Depo-Provera, the IUD, condoms, and male and female sterilization.

5. FAMILY PLANNING/POPULATION PROGRAMS AND POLICIES

a. Fertility and Population Growth: Current Policies and Programs

A review of statements on population growth as well as of family planning activities reveals a variety of viewpoints and also inconsistencies in the three Great Lake countries. While Burundi's 1978-1982 development plan states that the country's population size and growth rate are acceptable, it recommends population resettlement from heavily populated areas. Moreover, the government is aware of the pressures on health, educational and agricultural services created by rapid population growth, as well as the contributions to health and well-being which can be made by family planning and birth spacing. However, the Catholic Church's opposition to family planning represents a semi-official position; in any event, a national-level maternal and child health/family planning program has yet to be initiated.

The government of Rwanda appears to be in a period of transition from outright prohibition of family planning information and services to some kind of national plan in this area. The Scientific Council for Socio-Demographic Problems has studied population issues and provided family planning training since 1974; to an increasing extent the government recognizes the problems which frequent pregnancies pose to women, and (primarily through "natural family planning") encourages birth spacing, though not family size reductions. At the same time, population growth reduction was one

of the goals of Rwanda's 1977-1981 development plan, and President Habyarimana has acknowledged that rapid population growth impedes the nation's ability to feed its people and improve the standard of living (Habyarimana 1979). Still, family planning is only encouraged in the context of development (Niyibizi 1979; Republique Rwandaise 1978). Three regional hospitals have already begun to train personnel and provide services, with extension to the seven other prefecture hospitals expected soon. Rwanda has no formal law prohibiting abortion; although considered a failure of family planning it is now accepted under extenuating circumstances (Republique Rwandaise 1978).

Zaire's government has no explicit fertility reduction goal: family planning is promoted solely fo its effect on health and well being "...without necessarily implying a reduction in the number of children" (Kikassa 1974). And President Mobutu said in 1972 that, with respect to the country's initiation of a family planning program, "the issue is not that of limiting births" (Ndjibu wa Moma 1979). Still the president of this program (the National Committee for Desired Births) has noted that improved prospects of infant survival may lead parents to want fewer children (Kalonji 1978). The CNND's broad goals have been the promotion of family planning in conformity with traditional zairois values, and the encouragement of improved maternal and child health and child rearing, as a means to national development. Its specific activities are:

- the treatment of sterility;
- the adoption of family planning, resulting in birth intervals of at least two years; and
- efforts to improve children's health, concentrating on the under-five age group.

At this writing there are at least 97 branches ("antennes") of the CNND, of which 18 are in Kivu. The CNND works with public clinics and coordinates population assistance by donors as well as mission-sponsored contraceptive services. Also working in this area is the Centre d'Afrique Francophone d'Infertilite et de Sub-fertilite (CAFIS), directed by the National University of Zaire's school of medicine, and established to diagnose sterility and discern its causes. The Church of Christ in Zaire (ECZ) represents Protestant missions by providing family planning services in a network of hospitals and dispensaries throughout all of Zaire. It is the principal family planning activity integrated with maternal and child health in cooperation with both Zaire's department of health and with the CNND (Wilson 1979). Although Zaire has recently expanded its legal indications for abortion (Zaire, author not given, 1977), many midwives are reluctant to perform abortions because in many villages privacy is not possible.

b. Migration

In order to relieve some areas' population pressures, Burundi has recently been encouraging paysannat resettlement in relatively unpopulated regions. This policy has been most successful where individual families have established a rapport with their new

environment. However, in many cases farmers do not become adequately integrated into this environment (especially if not accompanied by their wives and children), but rather are transmigrants with dual loyalties to colline and paysannat. Rwanda has recently scaled down its resettlement efforts, believing that this policy represents more limited and less practical possibilities than was previously the case. Still, surplus workers have been encouraged to migrate to Burundi, Zaire, Uganda and Tanzania, as well as to resettle on paysannats (Dubois 1975). As in Burundi this policy often results in family tensions. Furthermore, many of the regions receiving in-migrants are themselves experiencing mounting population pressures; and because this policy treats symptoms rather than causes, it represents little more than a temporary stopgap. Nevertheless the government recently identified Rwanda's most densely populated prefectures (Ruhengeri, Butare, Gikongoro, Gitarama and Cyangugu) as areas from which workers should be encouraged to move (Niyibizi 1979).

c. The Future of Policies and Programs Designed to Reduce Fertility

The obstacles to fertility reduction in the three countries, particularly their rural areas, are numerous:

- the belief that life is God-given, and that childbearing is the principal reason for marriage;
- the association between a woman's status and her ability to bear children;
- religious and tribal taboos against contraception;

- individual families' need for many children where infant mortality is high and the standard of living low;
- children's value as a source of labor for the family farm, and of old-age security -- plus their relatively low cost;
- the large families of many national leaders;
- the opposition by many Catholic clergymen to family planning, and the prohibition to their members providing family planning services;
- ethnic pride and the desire of many groups to expand their numbers;
- the reliance of a system of subsistence agriculture on much unskilled labor;
- where sterility, infertility and infecundity are widespread, the frequency of pronatalist attitudes (Okediji 1975);
- historically, the free movement to adjoining countries which relieved existing population pressures and furnished remittances to families remaining behind; and
- governments' difficulties in establishing adequate health services (serving as a family planning infrastructure) which can keep pace with rapid population growth.

The three countries also have their own distinctive characteristics which create barriers to family planning program and policy development. Surveys in Burundi (Robatel et al 1974; Navas et al 1977) have revealed that for many people desired family size (around eight children) exceeds actual family size; furthermore, parents and children are often mutually dependent for child care, food, and medical and financial help. In Zaire, infant mortality is higher than in the other two countries. Many people there have voiced their opposition to such modern contraceptive methods as the pill, the IUD, and Depo-Provera; they fear medical side effects, including sterility. The view that artificial birth control is associated with marital

infidelity and declining moral standards is frequently expressed, especially by the Catholic Church in Zaire (CNND 1978).

Despite very high densities for such regions as Kivu, Zaire's administrative census of 1970 revealed a low population density for the country as a whole; as a result, fertility reduction has since then been given a low priority. (In any event, without a recent national census, any kind of planning is difficult; Zaire is now taking steps to conduct such a census.) Furthermore, there are still restrictions on information about and distribution of contraceptives. And since the government has never given clear directives concerning family planning, nor integrated the goal of individual-level fertility control with national-level population growth concerns, it is difficult to incorporate the CNND either into existing health structures or development plans. Finally, the collection of data used to evaluate regional programs is difficult because of transport and communications problems, and many of Zaire's family planning service statistics are incomplete, distorted, and out of date.

Zaire's health system also presents obstables to family planning program development. The government follows a policy of curative medicine, and only recently has family planning been introduced in medical curricula. Shortages of medical supplies have recently been exacerbated by the nation's inflation. Services are seriously maldistributed, and some of the more remote areas, to which medical personnel are not attracted, are completely excluded from services.

(It has been estimated that because of long distances, 80% of Zaire's population has access neither to a hospital nor a dispensary.) As in Zaire, Rwanda's actions are curative rather than preventive (statements in the most recent development plan to the contrary); hospitals receive a greater share of the health budget than do clinics. And preventive health, the necessary basis for a system of family planning services, has no organizational home.

On the other hand, there are positive signs in the Great Lakes region. The Zaire government's cooperation with such non-governmental organizations as churches, and its efforts to furnish family planning services along with nutrition and maternal/child health programs, are encouraging first steps. Moreover, the recent (albeit rather unscientific) survey conducted by the national family planning program's branches (cited in Section B.4 above) has shown a growing demand for these services (CNND 1978). In Rwanda, many parents, traditionally obliged to provide land and cattle for their sons, are seeing that growing resource scarcity renders additional sons more of a burden than an asset. In spite of the emphasis on curative medicine, more and more efforts are being concentrated on maternal and child health, and on health education. Also boding well for family planning in Rwanda are:

- a relatively homogeneous population, implying the possibility of some kind of agreement on population planning;
- in comparison with Burundi and Zaire, relatively good systems of secondary roads, education, nutrition, and health;
- favorable attitudes toward fertility control where basic health services have been established, and where reductions in infant mortality and malnutrition have occurred.

C. RECOMMENDATIONS

1. INTRODUCTION

Until recently a subject for heated debate was the question, which policy measure has a greater impact on fertility reduction: socio-economic development or family planning? One viewpoint was that the provision of contraceptive information and services constituted the most effective way to lower birth rates; the other, that only social and economic change can motivate families to have fewer children, that "development is the best contraceptive." In the past few years, however, there has been a certain convergence of the two beliefs, with most observers concluding that these measures are more complementary than mutually exclusive, and that family planning programs can be highly effective -- if operating in a favorable context.

A recent analysis of several Third World countries (Mauldin and Berelson 1978) examined the effects on fertility of (1) substantial progress in changing certain variables associated with reduced fertility (urbanization, equal distribution of income, non-agricultural employment, literacy, improved women's status, and increased life expectancy and infant survival), and (2) family planning programs. The authors' chief finding was that the two variables (social setting and program effort) acted together: those countries

which were most successful in promoting socio-economic development and which had also established vigorous family planning programs were more likely to witness fertility declines than were those countries where only one factor was present. More recently, a report of declining fertility in Europe between 1880 and 1910 (van de Walle and Knodel 1980) found that there was only a weak connection between the level of development and couples' receptivity to limit family size. A corollary to the authors' principal conclusion from this historical study (that in many instances development is not a precondition to reduced fertility) is the notion that rather than being an extraneous factor, family planning is a component of development.

Continuing this theme of complementarity, three distinct, but not mutually exclusive, courses of action designed to reduce fertility are recommended for Burundi, Rwanda and Zaire, and will be discussed below:

- vigorous family planning;
- efforts to influence those socio-economic conditions believed to be associated with reduced fertility; and
- incentives to reduced fertility, disincentives to high fertility, and the alteration of preferences from children to other values, by means of information, persuasion, and legal changes.

Lists 1 and 3 present examples of some goals and objectives of nutrition and population policies; lists 2 and 4, a wide array of interventions synthesized from a literature review of the three countries. It is the intent of this section to consider a few general

principles of development and fertility reduction, some ways in which programs can be strengthened, and the means to encourage responsible, informed decision-making about family size.

2. SOCIO-ECONOMIC DEVELOPMENT

Development is both a general goal (List 3) and a means (List 4) of achieving fertility declines (List 4). Although the literature on population and development identifies a number of socio-economic variables associated with reduced fertility, the discussion which follows is limited to feasible measures most likely to be associated with the motivation to limit family size in Burundi, Rwanda and Zaire. While many social scientists believe increased income and its equitable distribution are among the strongest correlates of reduced fertility, the two areas presented here are those in which change in these countries can more readily be brought about: improved women's status (a component of development, this section) and enhanced infant survival (a benefit of health program development, the following section). Although substantial progress is unlikely in the short term, governments should begin to concentrate their energies in these directions because of their likely effect on fertility.

With respect to women's status, which factors are most closely related to fertility level, and what are some of the most important issues in women's nutrition, family planning and development programs? Many students of population and development suggest that

improvements in women's position are likely to be more effective in reducing fertility than are either general development efforts or family planning alone, although in the short run fecundity is likely to rise as a result of better health and nutrition. While the effect of women's employment is unclear (except, in certain settings, where high work satisfaction and the financial and logistical incompatibility of labor force participation and childbearing have been found to be influential), education, especially for young women, is in many instances associated with sizeable reductions in fertility.

- Associated with an increase in the average age at marriage, it thus reduces the total time during which a woman is exposed to in-wedlock pregnancy;
- It fosters receptivity to change from a traditional to a modern outlook, itself a frequent precondition for altered family size preferences; and
- It often leads to types of work and income levels which in turn are likely to lead to lower fertility.

Marriage is another women's issue which can have important implications for fertility. One specific proposal is for governments to consider outlawing polygamy. Although few would say it causes high fertility, many social scientists believe that it is associated with illiteracy and tradition which, for their part, are associated with frequent childbearing. Another policy measure worth considering is to raise the minimum age at marriage, as a way of both shortening the time during which a woman may have legitimate children, and of reducing the fertility of adolescents, whose medical risks from childbearing are particularly great.

Among the most important recommendations for governments in this area is that they ensure the inclusion of women's own goals and priorities in development programs, and that they be aware of such programs' effects on women's traditional bases of authority and decision-making power. To be avoided are the perpetuation of labor force division by sex, the restriction of women to the primary phases of the production cycle, and their direction into stagnating sectors of the economy (Okeyo 1979). And women's non-familial roles should be recognized and encouraged. Nutrition is important for women whether or not they are pregnant or breastfeeding, and they should be participants in, rather than targets of, family planning programs (Zeidenstein 1978).

3. POLICIES AND PROGRAMS

As a preliminary note, it is recommended that the governments of Burundi, Rwanda and Zaire be encouraged to view fertility reduction rather than migration as the key solution to rapid population growth. First, resettlement is not necessarily synonymous with socio-economic advancement, and, at least in Rwanda, barely 10% of the population moves for non-familial or non-matrimonial reasons -- demonstrating the strong attachment to the region of one's birth. But perhaps most important, resettlement will not, except perhaps in the short run, ease population pressures: to an increasing extent, countries adjacent to densely populated regions in Burundi, Rwanda and Zaire have their own set of demographic problems. The

only answer is to bring down birth rates. In Rwanda, the belief that voluntary migration can solve the country's population problems is, in the words of one author, little more than a dream (Sharp 1978).

One of the most important recommendations for the development of family planning and nutrition programs is their integration and coordination -- with (1) health services (post-natal arrangements, maternal and child health programs) and women's, agricultural, and general development programs; (2) information and education, in order that they not be limited to mere distribution centers; and (3) surveys, program evaluation, and other kinds of research.

While reduced infant mortality was one of the two likely determinants of lowered fertility mentioned above, cause and effect are difficult to establish; indeed, according to the historical study of reduced fertility in Europe cited above (van de Walle and Knodel 1980), the relationship between the two variables may be even more complicated than previously believed. Still, in certain cultures (including a number of African countries), survival is so highly valued that reduced infant mortality is a fairly common incentive to birth spacing and limiting births. Moreover, the influence of medical centers on favorable attitudes toward family planning was demonstrated in Section B.4 (Robatel et al 1974). Other advantages of integrating family planning and health include:

- the demonstration of relationships among determinants, correlates and components of fertility. (These include spacing, health, weaning, and nutrition as a means to extend contraceptive

continuation, by combating anemia and preventing nutritional losses - both often associated with IUD insertions and pill usage, respectively;

- enhanced awareness of ways to improve infants' survival;
- the use of only one distribution system;
- the provision of a package of interventions, with the expectation that recipients will accept one and subsequently others; and
- the established goal of serving a large number of persons.

Brief mention should be made of some of the important principles of family planning/nutrition program planning and evaluation. These include:

- the identification of objectives (improved nutrition and health, fertility reduction) and vulnerable groups (the malnourished, those needing family planning services) as well as the means to attain these objectives;
- the establishment of central statistics sections which furnish data for program development. Surveys can be used as supplements or substitutes to censuses and/or vital registration, as well as the foundation for demographic projections;
- verification of the results of studies already conducted; the use of research results in policy and program development; and the encouragement of translators, or personnel who can apply scientific findings to policy development;
- the identification of some of the nutritional and demographic effects of other policies and programs; and
- the evaluation of programs according to their effectiveness in, for example, changing customs, improving health and lengthening birth intervals.

4. KNOWLEDGE AND CHOICE

The development of population and nutrition policies and programs in Burundi, Rwanda and Zaire should take into account a number of cultural practices and beliefs. In general, while these countries should be receptive to change, advances in reproductive and health technology need to be cautiously introduced in the context of effective traditional practices. For example, women need to be encouraged (and assisted in ways) to continue breast-feeding, a "natural technology" (Winikoff 1979). In a similar vein, program planners and policymakers should be aware of prevailing sexual and reproductive practices (withdrawal, abortion, taboos) and common attitudes influencing childbearing decisions. (See also Section B.4, above, which describes some results of surveys in this area.)

If strategies are directed toward the community and its local goals, and person-to-person communication, whether individual or collective, relies on respected members of that community, programs will be able to take into account such cultural factors as dietary customs and attitudes toward family planning programs -- thereby allaying or forestalling apathy, suspicions, and hostility. Finally, family planning surveys should be alert to the possibility of language difficulties between interviewers and respondents. For example, confusion over the meaning of such terms as "family planning," "expected" vs. "desired" births; and fetal and child death has been observed elsewhere in Africa (Lucas and Ware 1977).

Education and literacy play a major role in efforts to improve nutrition and reduce fertility. (See Section C.2, above, for their role in influencing fertility reduction.) Furthermore, one of the surveys cited in Section B.4 (Robatel et al 1974) has documented some kind of association between information provided by socio-medical services and favorable attitudes toward family planning. Moreover, the same survey found literacy to be a characteristic associated with an interest in family planning techniques. Governments can and should promote a number of general ideas which can lay the groundwork for the motivation to limit family size:

- encourage the view that socio-economic development and family planning are complementary, not exclusive;
- encourage parents to take responsibility for furnishing limited resources to their offspring; and
- create an awareness of soil erosion and other population pressures. (See Section B.4, studies by Sledsons, Gakwaya and Kameya, and Godding, which found population density or the awareness of this problem to lead a number of respondents to question the wisdom of having numerous children.)

In addition, three distinct subjects deserve promotion.

- Nutrition education, emphasizing the benefits of improved intake. Educational messages should allow people to continue former practices (such as prolonged lactation) but also to adopt new, beneficial ones (unfamiliar nutritious foods).
- Family planning and family life education, to relieve fears of medical problems associated with modern contraception; to abolish the myth that the birth of a girl as opposed to a boy is the fault of the mother; and to eliminate the belief that contraception lowers moral standards and causes sterility. Family planning should be conveyed as a means of providing benefits, and should rely on publicity to legitimize it and diminish its traditional association with extra- or pre-marital sexual activity.

° Population education, the goal of which is to relate demographic factors to (1) the analysis of those problems which students and their communities consider the most important, and (2) the means by which these factors can be influenced in order to improve the quality of life.

Underlying these recommendations is the high value assigned to informed choice. In the realm of family planning, the decision to space and determine the number of children is a fundamental human right. In a medical context, men and women alike should have a choice of methods, including sterilization and abortion, backed up by necessary information, without which such a choice is hardly free. Finally, at the community level, governments should begin to consider ways of encouraging all people, particularly civil servants, to take responsibility for the costs of their children; the elimination of incentives to and bonuses for high fertility is a first step. At the same time, as a society becomes increasingly modern, childbearing becomes more and more a choice among alternatives; it is these alternatives which, in such a context, become as valuable as large numbers of children.

D. CONCLUSION

This report has provided information on some of the most serious population problems in the Great Lake countries: high density in Burundi, Rwanda and Kivu; and large population growth rates and age-dependency ratios throughout the entire region. The undesirable consequences of these demographic developments are numerous; discussion is here limited to nutritional consequences. The role that cultural practices play in the development of malnutrition should not obscure the fact that such factors as food shortages, inferior soil quality, low income, and health problems are contributed to by, and exceptionally difficult to resolve in the face of, such rapid population growth.

Specific political, economic and social measures are proposed in Lists 2 and 4. Other more general recommendations and themes include awareness of and attention to traditional beliefs and values, efforts to upgrade women's status, measures to strengthen planning and research in population and nutrition, and the realization that slowing population growth is not a final objective but rather a means of (in fact, a requirement for) achieving greater socioeconomic development (List 3).

In recognizing that rapid population growth and the reduced availability of land are among the more acute problems facing

Burundi, Rwanda and Zaire, it is true as well that each country has its own set of characteristics, its own history, and its own brand of policies and programs -- all of which constitute a way in which each can learn from the others. For example, the surveys on fertility and family formation in Burundi constitute research essential for the development of family planning programs. For its part, it may be that Rwanda will develop a policy to reduce fertility based on the awareness of the problems which rapid population growth creates for development and also organized around the nation's relatively well distributed public health system. And Zaire is presently conducting nutrition research in Kivu as well as developing and evaluating its national family planning program.

While all these efforts are commendable, efforts to bring about regional cooperation are equally desirable. Section B.5, which discussed population/family planning programs and policies, identified some of the difficulties confronting a country in developing a consistent policy of population growth reduction and in establishing a vigorous family planning program. Among the greatest contributions which the CEPGL could make are to develop a demographic and statistical office, to conduct research in family planning, and to establish some kind of inventory of information on strong and effective nutrition, family planning, and women's programs. In so doing the Community would lay the foundation for the development and improvement of both country-specific and regional programs. The importance of integrating and coordina-

ting population and nutrition research and programs has been stressed. These recommendations for the CEPGL constitute recognition of the desirability of integration and coordination at the national level as well.

Table 1a. MORTALITY: CURRENT RATES

	BURUNDI	RWANDA	ZAIRE
Crude Death Rate	20 [1]	19 [1]	19 [1] [2] [Kivu: 17.9]
Infant Mortality Rate [1]			
TOTAL [3]	140	127	160
° Boys [3]	159	137	173
° Girls	129	117	146
Life Expectancy at Birth [1]			
TOTAL [3]	45	46	46
° Boys [3]	43	44	44
° Girls	46	48	48

Sources:

1 Haub and Heisler (1980)
2 Boute and De Saint Moulin (1978)
3 Haub (1980)

Table 1b. MORTALITY: PROJECTIONS

	BURUNDI		RWANDA		ZAIRE	
	Medium Variant	High Variant	Medium Variant	High Variant	Medium Variant	High Variant
Crude Death Rate						
1985-1990	16.7	15.5	15.5	15.1	14.7	14.5
1995-2000	13.6	12.0	11.8	11.2	11.1	10.8
	Medium Variant		Medium Variant		Medium Variant	
Life Expectancy at Birth						
1985-2000						
° Boys	47.3		49.1		49.4	
° Girls	50.6		52.5		52.6	
1995-2000						
° Boys	51.2		53.9		54.4	
° Girls	54.7		57.5		57.6	

Source:

United Nations (1979)

Note:

The variants used refer to population growth, and thus are inversely related to mortality levels.

Table 2a. FERTILITY: CURRENT RATES

	BURUNDI	RWANDA	ZAIRE
Crude Birth Rate	47 [1]	50 [1]	46 [1] / Kivu:51.9 [2] /
Total Fertility Rate [3]	6.3	6.9	6.1

Sources:

1 Haub and Heisler (1980)
2 Boute and De Saint Moulin (1978)
3 Haub (1980)

Table 2b. FERTILITY: PROJECTIONS

	BURUNDI		RWANDA		ZAIRE	
	Medium Variant	High Variant	Medium Variant	High Variant	Medium Variant	High Variant
Crude Birth Rate						
1985-1990	44.9	46.0	47.6	49.0	41.0	43.4
1995-2000	39.8	42.1	42.0	44.8	32.1	37.0

Source:

United Nations (1979)

Note:

The variants used refer to population growth, and thus are directly related to fertility levels.

Table 3a. POPULATION GROWTH: CURRENT RATES

	BURUNDI	RWANDA	ZAIRE
Total Population (Millions)	4.5 1/	5.1 1/	29.3 2/ /Kivu (1975): 3.8 7 1/
Annual Rate of Natural Increase 1/	2.7%	3.0%	2.8%
Doubling Time (Years) 1/	25	23	25

Sources:

1 Haub and Heisler (1980)
2 Boute and De Saint Moulin (1978)

Table 3b. POPULATION GROWTH: PROJECTIONS

	BURUNDI		RWANDA		ZAIRE	
Total Population[1] (Millions)	Medium Variant	High Variant	Medium Variant	High Variant	Medium Variant	High Variant
1990	5.9	6.1	6.6	6.7	37.0	37.8
2000	7.8	8.3	9.0	9.4	46.4	49.6
Annual Rate of Natural Increase[1/]	Medium Variant	High Variant	Medium Variant	High Variant	Medium Variant	High Variant
1985 - 1990	2.8%	3.1%	3.2%	3.4%	2.6%	2.9%
1995 - 2000	2.6%	3.0%	3.0%	3.4%	2.1%	2.6%
Stationary Population (Millions) Attained in Year 2160[2/]	20.0		25.0		122.0	

Sources:

1 United Nations (1979)
2 United States Agency for International Development (1980)

Table 4. POPULATION DENSITY: CURRENT RATES

	BURUNDI	RWANDA	ZAIRE
Population Per Km^2 (Total)	151 [1]	167 [1]	11 [1] [South Kivu: 180, Walungu 250, Ikoma] [2]
Population Per Km^2 (Agricultural Land)	249 [1]	293 [1]	83 [1] [South Kivu: 214-320] [2]

Sources:

1 United States Agency for International Development (1980)
2 Kabamba and Miatudila (1980)

Table 5a. URBAN-RURAL DISTRIBUTION: CURRENT RATES

	BURUNDI	RWANDA	ZAIRE
Percent Urban	5% [1]	4% [1]	30% [1] /Kivu: 16.0% [2]/
Annual Rate of Urban Growth [3]	1.7%	5.6%	5.4%

Sources:

1 Haub and Heisler (1980)
2 Boute and De Saint Moulin (1978)
3 United States Agency for International Development (1980)

Table 5b. URBAN-RURAL DISTRIBUTION: PROJECTIONS

	BURUNDI	RWANDA	ZAIRE
Percent Urban 2000	7.9%	10.3%	47.5%
Rate of Urban Growth 1975-2000	316.1%	527.8%	241.2%
Rate of Rural Growth 1975-2000	89.2%	112.1%	26.2%

Source:

Tsui (1979)

Table 6a. AGE COMPOSITION: CURRENT RATES

	BURUNDI	RWANDA	ZAIRE
Age Group by Percent of Total Population			
10-14	44.0	47.0	45.0
15-64	54.0	50.0	52.0
65+	2.0	3.0	3.0
TOTAL	100.0	100.0	100.0
Age-Dependency Ratio	85	100	92

Source: Haub and Heisler (1980)

Table 6b. AGE COMPOSITION: PROJECTIONS

	BURUNDI	RWANDA	ZAIRE
Age Group by Percent of Total Population 1/ 2000			
0-14	43.4	45.8	39.5
15-64	53.4	51.4	57.1
65+	3.2	2.8	3.3
TOTAL	100.0	100.0	100.0
Percent Increase in Children Under 15 1975-2000 2/	91%	103%	100%

Sources:

1 United Nations (1979)
2 McHale et al (1979)

Note:

Figures are based on growth projections using the medium variant.

Table 7. FOOD PRODUCTION AND SUPPLY

	BURUNDI	RWANDA	ZAIRE
Index of Per Capita Food Production (1969-71=100)	98.0	103.9	95.0
Per Capita Supply of Calories (Percent of Requirements)	99%	90%	85%
Per Capita Supply of Proteins (Percent of Requirements)	--	85%	53%

Source: United States Agency for International Development (1980)

Table 8. DIET: RANK ORDER OF FOOD TYPE AS A SOURCE OF CALORIES (1975)

	BURUNDI	RWANDA	ZAIRE
1.	Roots and Tubers	Cereals	Roots and Tubers
2.	Cereals	Sugar and Honey	Cereals
3.	Pulses	Meat and Offals	Oils and Fats
4.	Alcoholic Beverages	Oils and Fats	Fruits
5.	Fruits	Roots and Tubers	Nuts
6.	Oils and Fats	Fish and Seafood	Pulses
7.	Meat and Offals	Fruits	Meat and Offals
8.	Milk	Alcoholic Beverages	Sugar and Honey
9.	Nuts	Vegetables	Alcoholic Beverages
10.	Vegetables	Milk	Fish and Seafood
11.	Sugar and Honey	Nuts	Vegetables
12.	Fish and Seafood	Eggs	Milk
13.	Eggs	Pulses	Eggs

Source:

Tsui (1979)

Table 9. WOMEN: CURRENT SOCIO-ECONOMIC DATA

	BURUNDI	RWANDA	ZAIRE
Percent of Women Married 15-19	12%	15%	46%
Percent Adults Literate			
° Women	7%	9%	14%
° Men	21%	24%	49%
Percent Enrolled in School Ages 6-11 (1975)			
° Girls	16%	43%	55%
° Boys	23%	51%	80%
Percent Enrolled in School Ages 12-17 (1975)			
° Girls	5%	11%	29%
° Boys	11%	14%	60%
Women as Percent of Total Labor Force	44%	48%	42%
Percent Employed Women Working in Agricultural Sector	93%	96%	95%

Source: Haub (1980)

List 1. Nutrition Policy: A Hierarchy of Objectives (Examples)

OVERALL GOALS

Ongoing balance between population and food supply

A well-nourished population not susceptible to seasonal influences

↑

COLLECTIVE OBJECTIVES

Attainment, maintenance of sufficient food supply

Reduction of famines

↑

INDIVIDUAL OBJECTIVES

1. Nutritional Status

   - ° Reduced mortality, morbidity
   - ° Increased abosrption of nutrients
   - ° Reduced nutritional needs

2. Attitudes, Behavior

   - ° Awareness of problems of soil erosion, population pressures
   - ° Interest in practice of birth spacing and family planning
   - ° Improved dietary practices
   - ° Interest in fish, seafood
   - ° Increased consumption of fortified, powdered milk
   - ° Prolonged location
   - ° Inclusion of moderate amounts of soy flour in diets: it supplies protein, but at the expense of calories (Wils, Carael and Tondeur 1976)
   - ° Inclusion of manioc in a varied diet, in which nuts and pulses compensate for that food's lack of protein (McDowell 1976)

↑

ACTIVITIES AIMED AT INCREASING FOOD SUPPLY AND IMPROVING NUTRITION (See List 2)

List 2. Food and Nutrition: Suggested Measures (Ideas Extracted from Literature on the Great Lake Countries)

A. INSTITUTIONAL MEASURES

° Agricultural ministries: consolidation of role coordinating and executing government policies, plans; establishment of statistical sections providing an information base of comparable data.

° National nutritional offices: collection of statistics; management of nutritional research.

° Establishment of basic principles of nutritional planning: surveillance, utilization of research, identification of objectives and target groups, preparation of interventions, evaluation of activities, identification of nutritional effects of other policies and programs.

B. ECONOMIC MEASURES

° Development of integrated monetary economies.

° Improved agricultural systems.

- Rationalization of agriculture.
- Provision of stimulants to youths to remain in rural environment.
- Establishment of permanent water supply to rural areas, thereby freeing women from time-consuming tasks and enabling them to take courses at social centers.

° Opening of countryside (especially South Kivu) to commerce (Kabamiba and Miatudila 1980).

C. SOCIAL MEASURES

° Health Services

- Emphasis on prevention, especially of communicable diseases.
- Integration of nutrition services with health services (particularly maternal - child health, family planning).
- Expansion of health systems to rural areas.

° Nutrition education at all levels.

- Training for health professionals.
- Integration with health education, cooking classes.
- Integration with women's groups, canteens, agricultural development.
- Conversion of nutrition centers to rural extension services, therevy precluding their continuation as mere distribution centers.

D. TECHNICAL MEASURES

° Agricultural development, food production.

- Soil conservation, protection, rotation.
- Crop diversification.
- Increased emphasis on legumes, fruit, cereals; reduced emphasis on manioc, sweet potatoes.
- Consideration of nutritional content of new plant varieties before their introduction.

° Research.

- Nutritional surveys (incidence, severity, causes of nutritional diseases, by socio-economic group).
- Dietary practices; influence of beliefs, income, social mobility, education and publicity on food purchases.
- Evaluation of nutrition programs according to changes in dietary practices, reduced infant mortality.
- Verification of recent nutrition studies (by Vis, Yourassowsky and Van Der Borght 1975; Mutima 1976; Godding 1980; and Kabamba and Miatudila 1980).

List 3. Population Policy: A Hierarchy of Objectives (Examples)

OVERALL GOAL

° Socio-economic development

↑

COLLECTIVE OBJECTIVES

° Balance between population and resources (e.g., Food supply)

° Reduction of rate of population growth

° Reduction of size of stationary population

↑

INDIVIDUAL OBJECTIVES

° Family well-being

° Improved health, nutritional status

° Optimal maternal age; optimal number of, intervals between, births

° Acceptance of ideas, methods of family planning

↑

ACTIVITIES AIMED AT REDUCED FERTILITY

(See List 4)

List 4. Fertility Reduction: Options
(Ideas extracted principally from Berelson 1977)

1. Improve supply of, access to, fertility control and family planning services

   a. Traditional family planning

   b. Traditional family planning plus sterilization

   c. Traditional family planning plus abortion

   d. Community-based or commercial distribution of contraceptives

   e. Postpartum arrangements

   f. Integration into maternal-child health programs

   g. Integration into general health and nutrition programs

   h. Integration into community development programs

2. Affect demand for family planning

   a. Promote basic socio-economic determinants of reduced fertility

      ° General development, modernization

      ° Education, literacy

      ° Reduction of infant-child mortality

      ° Equitable income distribution

      ° Improved women's status

   b. Inform, educate, persuade

      ° Publicity (radio, newspapers, posters)

      ° Person - to - person communication

      ° Population education in schools

   c. Manipulate incentives to reduced fertility, disincentives to high fertility

      ° Individuals and families: housing, employment, maternity leaves, family allowances, social security

- Communities: schools, roads, water supply

d. Manage community change by political means: Development of an antinatalist consensus

   - Youth corps: Collective employment, instruction geared to modernizing attitudes, delaying marriage

   - Community pressures: Discouragement of nth child

e. Impose legal sanctions

   - Raise legal age of marriage

   - Prohibit polygamy

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