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POPULATION GROWTH IN KENYA:
POLICY FORMULATION AND IMPLEMENTATION

by

Robert James Whitacre

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ABSTRACT

This study examines population growth in Kenya since independence. In 1966, the Ministry of Health integrated the formerly private Family Planning Association of Kenya within its Family Planning Programme. The Programme's effect on reducing the birth rate is reviewed in conjunction with a demographic trends eliciting the conclusion that current growth rates cannot be sustained given land availability and resources; either human or natural forces will intervene to curtail population growth before the end of this century.

Kenyan population policy is analyzed with respect to both formulation and implementation. This analysis indicates that full internalization of costs and benefits associated with such population increases requires a significant expansion and change in the methodology of the Family Planning Programme. Additional policy tools are presented and their feasibility within the present institutional framework discussed.

POPULATION GROWTH IN KENYA:
POLICY FORMULATION AND IMPLEMENTATION

A rising population growth rate presents a serious detriment to economic progress and the welfare of citizens in developing as well as developed nations. Since the major impact of excessive population growth is not experienced immediately, some governments have not incorporated population controls in their developmental policies. The Kenyan government has become aware of the consequences of continued population increases and in 1966 integrated the formerly private Family Planning Association of Kenya with the ministry of Health. Unfortunately, since Kenya's independence, the advent of public health measures and the improvement of living standards have functioned to reduce the death rate and drive the birth rate to a staggering net increase of 3.5%, several times higher than that of developed countries.

This paper focuses upon current population policy and its determinants as expressed in the Kenyan government's Development Plan 1974-78. Initially, a review both statistically and dynamically of the most salient demographic aspects of the domestic Kenyan economy is undertaken. Consideration is given to the possible causes of population growth. The ultimate determinants of aggregate population growth are seen to depend upon individual households, such households being influenced by both social and economic conditions. Then the Family Planning Program is examined as a service industry as conceived and implemented in Kenya. In addition, an experiment is proposed to both ultimately make population growth an endogenous variable more effectively under government control and also generate the data necessary for practical policy planning. Subsequent to this discussion a partial summary of traditional and innovative policy tools is presented.

I Demographic Structures and Trends in the Kenyan Economy

In the past twenty five years Kenya's annual increase in population has risen from a level of 3.2 per cent to approximately 3.5 per cent (presently the rate may be even higher); one of the highest rates of population growth in the world. The implications of such a growth rate are staggering. Even within the next five years, the extent of the current development plan, if such growth continues unabated, an increase of twenty per cent will occur. If the population growth rate were to fall back to the former rate of 3.3 per cent the population of Kenya would triple by the end of the century, would be over 70 million fifty years from now and it would reach over 475 million less than one hundred years from now.

These latter figures clearly cannot be sustained by the Kenyan economy given current land availability (17% of Kenya's land area is suitable for cultivation) capital, and technology from any present perspective. Either natural or human instigated factors will eventually, and not too distantly, intervene to limit overall density upon the land; concomitantly implying a radical decrease in the growth rate. Throughout history starvation, disease and war have served to come on the train of excessive population growth. Recent history in other African countries, primarily in the Sahelian zone, demonstrates the most prominent natural restriction: limited food supplies resulting in mass starvation.

A more detailed demographic analysis requires examination of the specific characteristics of a rapid population growth rate arising from the present population.

Since farming and related activities constitute major industries of the Kenyan economy, population density, particularly that upon arable land, is of particular interest when analyzing demographic characteristics. Indeed the current development policy is to emphasize agricultural growth.

Assuming current population growth rates are maintained population density per square mile will increase from 22 to 26 persons within five years. Such figures, while quite high, grossly understate the prevailing skewness of the rural population. Fully 90 per cent of the land is uneconomical

agriculturally; primarily the result of low and intermittant rainfall. As a result such land is sparsely populated and the vast majority of both existing and future population must be contained in the land which remains. In an agricultural setting 42.9% of the population live at densities of over 200 per square kilometer. Considering the family unit as the basis of farm size this implies that at present a family with six members have less than six hectares of agricultural land, or less than two acres per person. Compared with developed countries the resulting average farm size is small; thus preventing easy acquisition of existing farm technology from the industrialized economies, such technology which has been developed primarily for large scale operations.

A reading of the Development Plan makes it clear that population growth is probably, if not certainly, the major problem facing the country; a problem that is getting worse instead of better.

A rapid population growth generates a young age distribution and a large percentage of women in the child bearing age group. Also implied is a very high dependency rate, that is the number of people supported by each worker. Such a high dependency rate requires a correspondingly high rate of consumption for the family unit. Since private savings is private noneconsumption at least part of the decreasing trend in private savings in recent years can probably be ascribed to the rising population growth.

Working at cross purposes is that a high population growth rate requires relatively more schools, hospitals, roads, and other elements of what is termed social capital to achieve the same rate of per capita development as required by a lower birth rate society.

Furthermore in an economy with a small industrial sector, capabilities for technical training are severely limited. This implies that most people who reach the labor force age group are destined to be unable to function within a technological society and thus fill the ranks of the unemployed. This in turn aggravates areas such as crime control and tends

to widen the income distribution.¹

II) Determinants of Population Growth

It has only been within the last decade that truly effective medical techniques have been developed to bring population growth significantly within the realm of purposive human control. Economists during the last several decades have gradually come to isolate some of the causal factors determining fluctuations in birth and death rates and have constructed predictive models for population growth from which developed nations have gained useful information in their economic planning.²

Contraception techniques are now widely used in most of the developed nations of the world and a few of the less developed nations with considerable success. During the current five year plan the Kenyan Government plans to spend a meager £10-12 million on its Family Planning Program; less than one quarter of one per cent of the anticipated Gross Domestic Product. In this amount of funds adequate and is the program constituted in an optimal manner? That is, ^{are} funds expended to obtain maximum benefit for the society as a whole? Before these questions can be answered it is necessary to examine the determinants of population growth.

Changes in the population level do not constitute a change in some vaguely defined economic statistic, rather such changes represent the outcome in aggregate of individual family decisions concerning births; decisions that are

1. For a much more thorough analysis of the potential courses of demographic trends in the Kenya economy the reader is referred to J. Cremer, "Some Notes on the Population Problem" IDS Staff Paper Number 109. This present study is concerned with the problem of how to achieve the most desirable of these potential population growth paths.

2. The lack of any explanatory model (besides crude extrapolation) accounting for population growth used by the Kenyan Government is apparent when reading the Development Plan 1974-1978. Construction of an adequate model predicting population growth for long range planning purposes would seem an important task. Such a quantitative prediction device would be an output of the experimental proposal contained in section III.

in part affectable by policy. That part which is currently and/or potentially controllable represents endogenously determined population growth.

Individual family responses to their environment contributes to a population explosion both through intended and unintended components.

Intended births by family units requires initially a basic knowledge of the association between coital contact and pregnancy. While this knowledge is widely known by the well educated it should be emphasized that the present educational curriculum of the public primary schools in Kenya does not yet have a program of sex education. Thus many individuals, even though they have received formal training, are essentially ignorant of the most basic anatomical facts.

Also even among those who have the rudiments of knowledge required for intentional family planning there remains a significant component of unintended birth rates arising from erroneous expectations. In recent decades the continuous decrease in infant mortality caused by better overall medical care adds to the population growth rate. A family which expects a lower survival rate than actually exists will plan to have a greater number of children than if actual survival rates were known. This arises as correspondingly more births will be planned to achieve the desired family size.

The methods of controlling family size delineate the opportunity set of actions possible to achieve desired family goals. The effectiveness of the various alternatives in turn contributes to the intended and unintended components of overall growth rates.

For those practising family planning the following classes seem to encompass the major forms:

- 1) abstinence
- 2) periodicity
- 3) sterilization
 - a) tubal ligations
 - b) vasectomies

- 4) contraceptive pills
- 5) contraceptive devices
(intrauterine devices, diaphragms)
- 6) condoms
- 7) foam
- 8) abortion

For the vast majority of Kenyans either abstinence or periodicity are the only available alternatives. This arises both due to a basic lack of information regarding both effective contraceptive equipment and readily accessible locations where these other alternatives can be acquired. Clearly abstinence, because of the requirement, is not reasonably viable. Periodicity on the other hand has extremely limited effectiveness both due to its inherent long term low probability of success and general misconceptions concerning the most fertile periods in the menstrual cycle.

Sterilization, (tubal ligations, and vasectomies), while effective, have definite drawbacks. In societies where these alternatives may be reversible and economically feasible, the percentage of those actually utilizing these methods (either male or female) is still small, though increasing. It is difficult to imagine that in a society where males equate sterilization with castration adoption of these methods to any significant extent will not occur, except through coercion; a characteristic more of command than market economies and definitely incompatible with the concept of freedom.

Contraceptive pills and devices have met with considerable success in the developed economies as well as some underdeveloped economies. The primary differences between the two techniques is that the pills require continuous usage whereas contraceptive devices typically require the services of medical personnel for installation and checkups. Effectiveness of these types of contraceptives is extremely high while dangers from side effects are relatively low, much lower than those ascribable to childbirth. An additional advantage is the low cost per family; especially when developed countries can probably be effectively solicited to underwrite birth control programs.

Given the various means for limiting procreation it remains to examine the various factors determining desire by the family unit to actually limit births. Also of interest is whether these determining factors on an individual level are consistent with the objectives of society as a whole.

The determinants of family size take place within an existing socio-economic framework. A change in this framework will frequently change the underlying incentive structure.

An example will prove illustrative. In India considerable social pressure is exerted on married women to frequently produce children, presumably to satisfy friends and relatives that she and her spouse are still compatible. Today in the United States a woman who has a child is somewhat 'undesirable' as she is contributing to the population problems; the more children she already has the more undesirable.³ This attitude in the U.S. is in marked contrast to that which existed but one generation ago. Given diverse attitudes the psychic value of a child will vary considerably from society to society. While these comments here are purely subjective, it appears that the average Kenyan family places a very high value upon children. The average couple have between six and seven children.⁴

Private costs of having a child include temporary withdrawal of the mother from employment, either at home or in the economy, maternity expenses, the feeding and clothing of a child, educational expenses, childrens' medical expenses as well as costs associated with dealings with the government through its various agencies.

Private benefits include the psychic value to the parents of having children for pleasure and for carrying on

3. Some might contend that this is too strong a statement, however from personal experience the author attests to the existence of both direct and indirect pressures against having even a first child. A glance through the classified ads of any U.S. newspaper in the house or apartment rental section by the reader will discover a marked aversion of landlords to children.

4 Statistic from IPPF, 1971.

the family name, the contribution to family income when sufficiently old, old age care, and benefits associated with the various government institutions.

The social benefits of an increase in the Kenyan population includes an increased ability to achieve differential specialization in production.⁵

The list of social costs associated with births is considerably longer. These are costs of primary school education, maternity care, the burden of dependency problem which decreases savings, population pressure on the land; addition to crime control, and the widening inequality of the income distribution (this arises if family size is a decreasing function of income; at least for higher income brackets).

III Formation and Mechanisms of Population Policies

The present government policy towards population is well summarized in the Development Plan, 1974 - 1978. "In 1967 the Government adopted an official Family Planning Programme, with three main components: clinical services, information and education, and training of family planning personnel. The main components of this programme are the following:-

- (i) Four hundred Family Planning/Maternal and Child Health service points;
- (ii) Four hundred Community Nurses or Enrolled Nurses, and 46 Provincial and District Community Nurses trainee - Supervisors and Family Planning Field Officers;
- (iii) Fifty -five tutors to staff the Community Nurse Training Schools;

5. Concerning social benefits from an increase in population I have received the comment "Surely (there) are others". I have been hard pressed to specify additional others beyond a vague statement that more people are somehow better than less.

(iv) Extension of the coverage of health, education and family planning information throughout the country.

The total cost of the Family Planning Programme during the coming Plan period will be K& 10.8 million. This will cover all those services mentioned above".

Besides many of the activities of the Family Planning Programme leading directly to population increases rather than decreases the government plans constructing many new hospitals, plans to offer free maternity care, is maintaining a school lunch program, and is making progress towards universal free education for all children up to form IV Primary School.

The present family Planning Programme, in regards to its effectiveness as presently constituted, must be viewed with some skepticism. Since its inception birth rates have increased rather than decreased.

The history of planning by the Kenya Government is as old, and as young, as the republic itself; dating back eleven years. The Government has chosen to follow a course of action based upon five years plans of action. The present Plan the third in the history of the republic, reflects an important change from the previous pattern. Whereas before "the main task of the planning organization was to identify and prepare development projects for implementation" "now" "the question of selection and the determination of an order of project and program priorities has, therefore, ~~now~~ become much more important".⁵⁶

Rather than establishment and formulation of the basic institutions of government the current emphasis is upon balanced growth through these existing institutions.

While a focus upon a five year planning horizon is sufficient for adequate planning of many economic variables this is certainly not true of planning for an adequate population policy. Even accounting for the development of a single generation from birth to probable parenthood, not to mention a whole life cycle, requires a planning mechanism

anticipating developments for a time span longer than the history of the republic itself.

Clearly there exist other economic variables having influence over a very long period. First among these in importance is education. This area of investment in human capital, despite a minimal potential return over any single five year plan period, presently constitutes twenty per cent of anticipated government expenditure. While expenditure on education in Kenya is probably in part motivated by political reasons an expenditure of such magnitude can only be justified by its probable effects on the long-run productivity of the labor force. Other projects worth mentioning having similar long and/or delayed returns include reforestation programs, technological expenditures, and wildlife conservation.

Given the above projects it is obvious that the government considers at least some aspects of long term growth. It is considerably less obvious how the Government is to formulate an appropriate population policy. This is especially true when examination of the various macroeconomic models currently available to the Ministry of Finance and Planning is taken into account. The World Bank Model, the major instrument of fiscal planning, treats population growth as strictly an exogenous variable. A similar treatment is

7. The importance of this particular model in terms of the Kenyan planning context can hardly be underemphasized since the Kenyan government has adapted most recommendations of this model. This model's internal structure however is officially a state secret. The model, in the words of one government official, "just has not worked." It would probably be quite beneficial therefore if the structure of the model were made public if only to allow the Government to obtain constructive criticism on the methodology and formulation of the model. Also such a "revealing" would enable the business community to better understand and predict the future course of economic events in light of government action, thereby reducing the uncertainty of business decisions.

also given by the Slater - Walshom model. From a purely analytical viewpoint a population policy based upon already applied microeconomic theory in the Kenyan economy presents no quantified method of judging the impact of government planning policy on population growth.

It appears that the Ministry of Finance and Planning is aware of the dangers of an excessive rate of population growth. The Minister of finance and Planning notes in the first page of the preface to the current five-year plan that - "One rate of population growth, at 3.5 per cent per annum, reduces the amount of resources available to each citizen, and delays the day when we will achieve the objective of a reasonable standard of living for every Kenyan."

The problem of developing an effective and adequate population policy ultimately depends upon a satisfactory quantitative model explaining the causal effects of potential government actions; until such development only qualitative predictions can be made. Establishment of a satisfactory quantitative model necessitates a base of adequate data. The particular types of data required depend upon the causal effects of variations in the various private costs and private benefits associated with having a child upon the birth rate. Given the recentness of the establishment of an independent Kenyan Government sets of data for an accurate statistical analysis of any investigation is extremely difficult. In the case of the family planning program, as indicated by the next section, a proper size of operations is most likely many times the present size and significantly above the government's ultimate objective as concerns family planning. Empirical estimation in such circumstances, even with "good" data would be extremely suspect.

IV The Family Planning Program as a Service Industry

The FPP provides basic services to individual families; the service of relevance here in birth prevention. Since the FPP provides this service such production requires inputs; capital and labor.

Prevention of a birth acts through an intermediary, the potential mother, who is the object of the FPP. Determination of how many births have been prevented per enrollee in the FPP is straightforward: It is the percentage of births of those not in FPP minus the percentage of births of those enrolled in FPP. This assumes, implicitly, that

the quality of FPP service is constant.

Let P_S equal the percentage of population on FPP, K stand for capital and L stand for Labor. Then a functional relationship f is hypothesized between output and inputs:

$$(1) \quad P_S = f(K,L).$$

It is anticipated that properties normally ascribed to production functions will hold for this relationship, e.g. eventual homogeneity less than one and positive marginal products.

Since the FPP is essentially offering an economic good, family planning services, a supply and demand analysis should be applicable in a proper economic interpretation. Thus the subscript S in equation (1). Demand for FPP services P_D is considered in the usual way; individuals having a reservation price for their willingness to join the program. Those at the top of the schedule are willing to pay quite a lot of money to avoid having a child whereas those at the bottom require exactly the opposite, e.g. a considerable stipend in order to prevent having a child. Algebraically

$$(2) \quad P_D = g(M) \quad g'(M) < 0, \text{ Here } M \text{ stands for Price}$$

Ideally the cost of birth prevention spent by Government on the margin should be equal to the entire discounted value stream society receives by such prevention. Translating this principle into a practical policy however is not necessarily easily achieved. In any event the methodological foundation of the present FPP does not attempt to improve social welfare according to the optimal principle stated above. The policy in the Development Plan 1974-1978 is initiated "in the belief that every parent who wishes voluntarily to take advantage of the facilities should do so." Such a goal fails to internalize the significant social costs involved in an excessive aggregate birth rate.

A graphical presentation, Figure 1 will help clarify the relationships involved between the present position of the FPP, the position aimed for in the Development Plan, and the optimal position. In the figure P_S is the dollar equivalent of Equation 1, supply of family planning services,

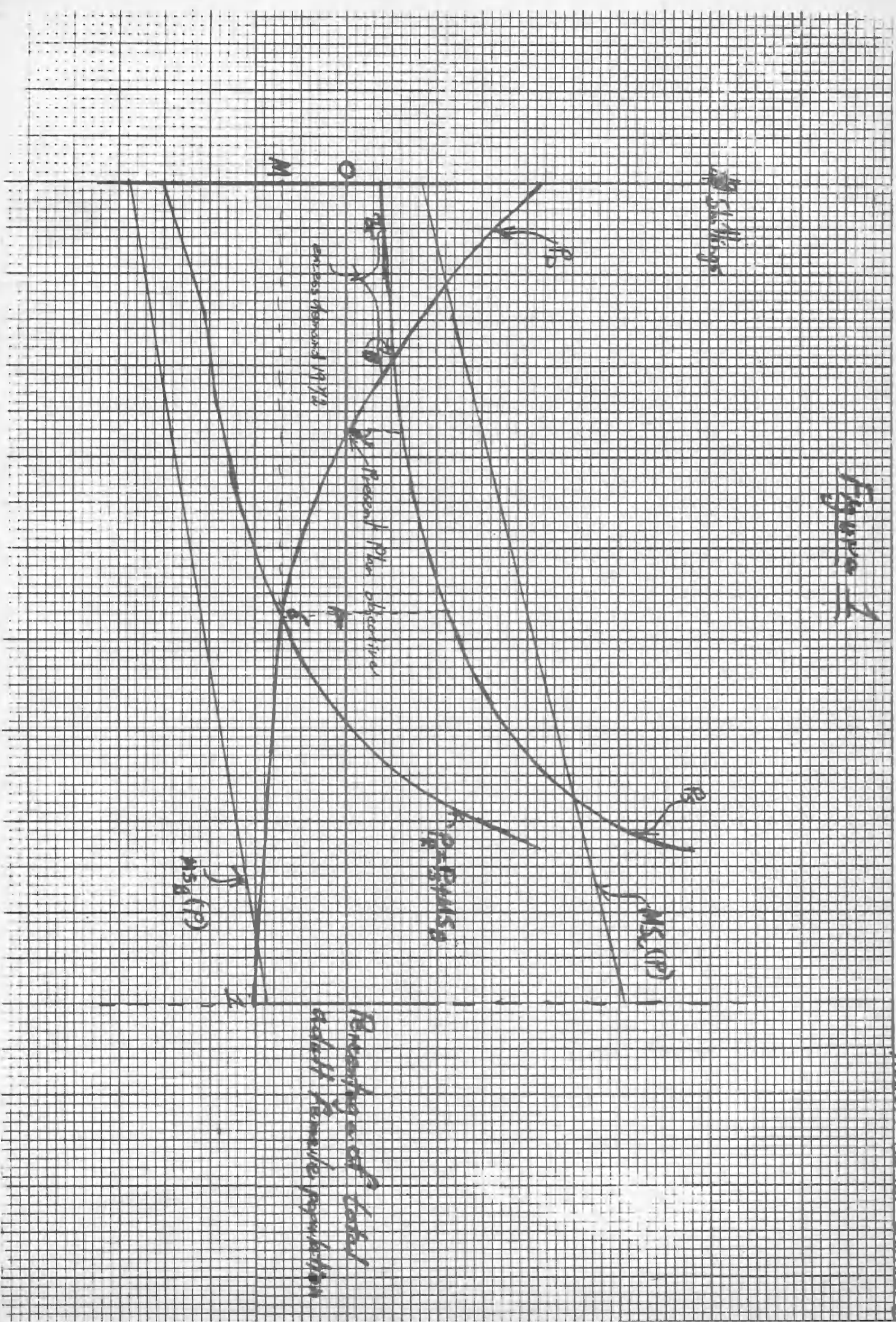
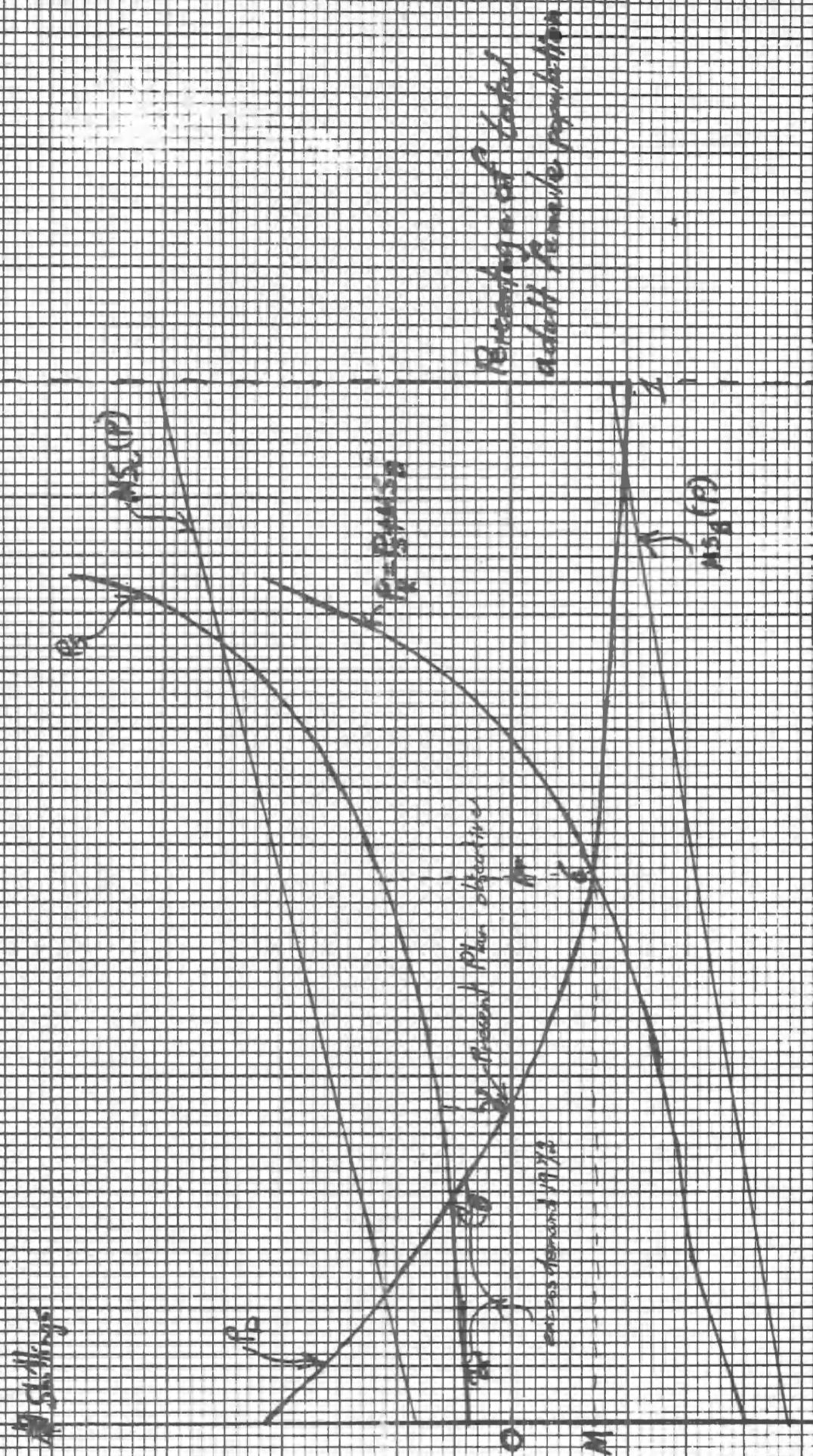


Figure 1

Robert Woods Mathews

Percentage of total
adult female population

Figure 4



P_D is the demand for these services, $MSC(P)$ is the marginal social cost of a woman not on family planning (here P is a percentage); the negative therefore being $MSB(P)$, the marginal social benefit of women being on family planning services.

If in the family planning services a free market were to prevail an equilibrium point such as β would be expected to eventually obtain.

At the end of 1972 relatively few areas received any services at all and, according to the Family Planning Association of Kenya. Annual Report 1972 those areas which received services typically experienced ~~excess~~ demand. Thus in 1972 production/ ^{occurred} at a point such as α with excess demand as marked.

Production of family planning services as presently envisioned by the government is at point α . That is, family planning services will be provided free to all those who desire them. The cost of this program is the area under the P_S curve from 0 to 2. Note that such production does not consider the externalities involved, the social benefits of birth prevention.

When social benefits of the FPP are taken into account optimal production of services results in production at point δ . This equilibrium point has several salient characteristics. Of primary significance is optimal production requires that a subsidy be paid to women involved in the program. This should not be surprising in light of one of the fundamental conclusions of welfare economics: It is either necessary to charge to the causer the marginal cost of the externality and distribute the proceeds to these affected or else to bribe the causer to prevent the externality in the first instance. The outcome here is consistent with this latter implication.⁷

In Kenya the possibility of charging the parents of the new-born the social cost of the externality they are producing is not

7. While the former means would be more lucrative for the government its feasibility in the Kenyan economy is rather low given the wealth of the rural population.

generally possible due to the lack of capital resources available to the vast majority of the population.⁸ Thus the only viable alternative for arriving at greater social welfare appears to be subsidization. From the viewpoint of Pareto optimality the difference between subsidization or taxation for externalities cannot be determined. From the Government's view point, the Government having the announced intention of increasing its relative size in the economy, a welfare decision between taxation and subsidization, if both were possible, would obviously be easy to make: taxation would occur. Such a choice however is not available in the present context.

The other interesting characteristic of the socially optimal point of production δ is that such production represents a scope of activities which, most likely, is significantly beyond that stated as the ultimate objective of the Development Plan, point or, Present financing of the Family Planning Programme, which has doubtful capabilities of fulfilling even present plan objectives, therefore represents gross underfinancing of an optimal Family Planning Program.⁹ Also this optimal point represents a scope of operations significantly beyond the range of any existing data base; thus precluding effective estimation of the optimal scope of the Family Planning Programme until adequate information becomes available through some planned program of data generation.

The proper data to gather depends upon the methodological format the Family Planning Programme is to follow.

Since the Kenyan Government is effectively the sole provider of family planning services it can utilize this monopoly position to reduce

8. Of course for higher income brackets this would not be true, social costs might be recoupable, say, through the income tax. More, however, will be said upon the present structure of income taxation later in this paper.

9. As noted elsewhere present financing has resulted in a family Planning Programme encompassing at most four per cent of the population.

overall costs of an optimal program through differential pricing of services provided. This can be done by distinguishing amongst individual markets available at each clinic. In addition since clinics in different parts of the country have different cost schedules an individualized situation, as in Figure 1, will typically prevail at each clinic; the implications being that the subsidy (DM in the diagram), the optional percentages of people on the program (OP* in the diagram) and total cost (the area under the cost curve $P_s O$ and P in addition to the total subsidy, area OP*DM) will depend intrinsically upon local conditions. In any final scheme the marginal cost of a decrease in the birth rate through any FPP distribution point should be equated between all such points. This holds for the usual economic reasons, e.g. maximizing cost effectiveness.¹⁰

This proposed reorganization of the FPP would affect the majority of the population, specifically the lower income rural population. As byproducts the subsidization scheme would (1) help to redistribute income from the urban to the rural sector; an announced goal of government action and (2) provide more accurate population data. One would expect any family at, near or below subsistence to have a very high rate of subjective time discount, thus increasing the likelihood of their accepting the scheme. Psychologically such preventive payments to potential mothers is tantamount to an organized program of operant conditioning directed towards eliminating excessive birth rates; this being a most effective technique for modifying social behavior in the long run.

10. Judging from the Development Plan some projects sponsored by the government appear to be operated on a cost benefit basis whereas others are not; the FPP apparently belongs to the latter category.

A possible lower bound on this marginal social benefit from a decrease in the birth rate is to consider only the direct costs associated with the Government's promised outlays for new members of the community; schooling and maternity care. As mentioned previously other social costs in addition to these accrue.

To empirically determine the demand curves required for efficient operation of the FPP it is necessary to obtain the relevant data through experimentation and then determine the proper functional form. A stratified sample of various charges for FPP services administered through the FPP distribution points should suffice to acquire the pertinent data.

The second problem, that of causal form, while more difficult, is a problem running the gamut of all empirical investigation of causal relationships in every science. There do exist criteriae for selection among a set of functional forms. These criteriae include:

- (1) A test of the posterior error distribution, according to some loss function based upon a hypothesis of random errors.*
- (2) A check on the Durbin-Watson statistic according to the various possible rank orderings of the independent variables.
- (3) The usual R^2 or adjusted R^2 criterion.**

One final remark concerning that part of the Family Planning Programme devoted to making it possible for previously barren parents to have children. Here it would seem most desirable, given the Government's objectives, to charge users of this service the full social cost of the externality they are generating by producing children.

V. Additional Policy Instruments

The restructuring of the social attitudes of citizens towards population replacement instead of growth is imperative in the present generation if the dire consequences of excessive population are to be avoided. Thus any serious governmental commitment to reducing the

* For Bayesians of course this is the only legitimate methodological statistical procedure. The proper loss function would presumably depend upon the losses involved in errors.

** It is noted that the same functional demand relationships might not hold for different societies due to differing socio-economic histories - Thus if this schemata were applied to another country the relationships determined might not be identical. The empirical implications will be a relatively inelastic demand curve if the unintended component of population growth rates is very large and relatively elastic if the intended component is large.

birth rate must be of greater scope than merely modifying or expanding the FPP. It should involve all ministries to the extent that the marginal cost in each ministry to prevent a birth is equal to the marginal social benefit achieved.

There are many areas where these exists excess demand for limited government services. The present allocation mechanism sets vague guidelines for assessing the applicants. It is suggested here that whenever limited amounts of a commodity or service are allocated such that there remains a number of citizens desiring to share in what essentially involves a government transfer payment, the government adopt a lexicographic allocation mechanism discriminating in favor of small families. For example, first priority for land resettlement can be limited to those parents who have not had a child for at least five years. Second priority to those who have not had a child for four years. Third priority to those who have not had a child for three years, etc.*

The following areas would seem to fit the requirements for an effective lexicographic allocation mechanism:

- (1) Land allocation through the ministry of Lands and Settlements
- (2) Allocations by The District Joint Loan Boards
- (3) Allocations arising from the Credit Guarantee Scheme
- (4) Licensing
- (5) Housing Allocations administered by the Ministry of Housing and other government bodies
- (6) Mortgages granted by the Housing Finance Company of Kenya
- (7) Credit to farmers administered by the Agricultural Finance Corporation

* These of course, are but suggestions for the various classes. The implication that a significant amount of petty bureaucratic power and inefficiency will be eliminated has been termed by one colleague as "an evident practical disadvantage." Hopefully this is not true. In any event it seems unreasonable to hold any government culpable for not using potential policy tools if it is in in ignorance of them or unaware of the significance of a policy of myopics planning.

(9 (8) The granting of contracts to individuals or firms (some average of employees might be taken) where bids are essentially the same.

(9) The allocation of all civil service jobs where there are more qualified applicants than vacancies. Presumably this would include all unskilled labor; janitors, street sweepers, etc. as well as many skilled jobs; policemen, armed forces personnel, etc.)

This list is most certainly not exhaustive. It demonstrates quite clearly that the breadth of government action can be expanded considerably.

Furthermore once allocation has been made a requirement for retention could also be that assignees not increase family size for a specified period of time. Violations resulting in forfeiture of property or payment of a specified penalty. Since allocations of commodities such as land, houses, etc., would be directed towards those who have smaller families real savings and thus real investment would increase within the economy. Rather than individual productive outputs being directed towards the feeding of yet further children a productive surplus would arise, part of which would be directed towards savings and future growth of the economy.

It should be reemphasized that all of these potential applications fundamentally change the incentive structure on the individual family level in an essentially costless manner, since no loss in aggregate output of the economy will occur. The cost incurred will be purely a psychic one, that involved in shifting to a new social order.

Along more traditional lines, there exist policies already applied in other countries with considerable success, which have yet to be implemented in Kenya.

First among these is a comprehensive family planning program in the primary schools. While contraceptives are now being introduced in some primary schools a much more comprehensive program is needed. Professional sex educational teaching units which travel from school to school designed to both teach the basic anatomical facts of reproduction and dispense contraceptives could provide an effective aid to population policy if students are reached in the years

just prior to puberty. Financing such a program could be achieved by an internal reallocation of the budget in the Ministry of Education.

Since the population problem is one that permeates all of Kenyan society it would seem unjust to leave the incentive structure for the wealthy unchanged, or even to have an official policy of promoting births; although probably unbeknownst to the administering officials involved. This latter case is the situation however that prevails in Kenya today as citizens paying income tax are given "tax relief" for having children, in the form of monthly deductions. Such an income tax law is directly contrary to a policy of attempting to internalize the social costs of births. This form of tax relief should be eliminated. In addition to a probable small decrease in the birth rate government resources would increase while tax laws and tax administration would be simplified.

Conclusion

The goal of this investigation have been the presentation of alternative courses of action in light of anticipated population trends. The Government's role in population policy has, in the past, been primarily passive in nature. Most funding has come from outside sources and the program is administered in the field by the Family Planning Association of Kenya; a semi-private foundation.

The Development Plan 1974-1978 emphasizes that the anticipated expenditure on the Family Planning Programme is eightfold what it was in the previous plan. It is emphasized here that such an expenditure increase is not very significant when it is realized that the final scope of the project represents less than one quarter of one percent of GDP; virtually a token effort in light of the serious population problem present. An eightfold expenditure increase is rather inconsequential when the base figure is close to zero.

The ultimate objective in the present plan period was expressed by the Officer of Information and Education in FPAK as achieving a population growth rate of 3%; an extremely high figure. Also, given that less than 25% have ever heard of the Family Planning Programme and that less than 4% are actually enrolled, achievement of this goal seems extremely unlikely given anticipated financing.

The proposals recommended here all have the advantage that they allow freedom of choice on an individual level. There is no overt coercion but merely economic incentives administered primarily through already existing institutions.

The concept of freedom means very little if individual citizens cannot exercise it, life should be more for the average Kenyan than a raw reach for survival in direct conflict with a mass of humanity. The decision for or against population control lies in the present and not in the future. A decision to pursue the present Development Plan strategy can be expected to lead, at best, to a marginal decrease in the birth rate and death rate, implying a continuation of the adverse population growth rate trends of the last two decades.

If the quality of life in Kenya is to be preserved and improved a radical change in the fundamental relationships influencing the birth rate needs to be taken. If human instigated changes are not induced now less desirable/^{ones} will automatically be forthcoming when the land cannot sustain an overabundant population. The Government of Kenya has the institutional ability to undertake such a change, what it needs is the will.

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