HEALTH MANPOWER PROBLEMS OF ETHIOPIA

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ABSTRACT. Health Manpower Development is a global problem, and the health manpower problem in Ethiopia is serious. Shortage of health manpower, maldistribution, high rate of migration and attrition represent quantitative problems. Lack of progressive National Policy socio-economic underdevelopment, uneconomic manpower utilization, imbalance between different disciplines, lack of relevance and lack of personal and professional development schemes lead to quantitive problems. Health manpower planning, production and management should be integrated. More effort is required in this regard than is shown at present. Additionally, a simple but sound evaluation mechanism of efficiency and effectivity must be developed, and suggestions are put forward here.

In many countries today, the health manpower situation leaves much to be desired. In the past, this problem has always promoted the same type of reaction: to step up the training of the "classical" types of health worker. However, it can be said with some certainty that to produce more of the same type (usually disease- and hospital-oriented) of health worker will not solve health service problems — nor, which is more important, the health problems of the people [20, p. 432]. The health manpower problems of Ethiopia can be seen from two aspects: namely, the qualitative and quantitative problems [1, 19, 21 and 25].

1. QUANTITATIVE HEALTH PROBLEMS OF ETHIOPIA

1.1 *Shortage.* This refers to shortage of health personnel both in number and in kind. The primary problem in this context is training schools, inadequate because of lack of facilities for training the required type and number of health personnel; and a general shortage of teachers of health sciences, especially those with competence to plan, implement and evaluate the teaching/learning process. One major cause which has aggravated the shortage is the long and expensive methods of teaching in

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an attempt to train the "classical" standard health worker, which require high-calibre teaching staff and sophisticated facilities [9, p.16]. Both the latter are difficult to acquire because they are usually beyond the resources of the country, and government investment in such fields has been very limited (Table 2). The ratios of health workers to population clearly show the serious shortage of health manpower (Table 2)[1]. The demand and supply data also show the severity of the problem (Table 3)[2].

TABLE 1

Health Personnel Training Schools in Ethiopia and their Average Annual Output, 1978

Ser. No.	Schools	Type of Health Personnel	Duration of Training in years	School Locations	Average(*) Annual Output
1.	A.A. University				
1.1	Medical Faculty	Medical Doctors	12 + 7	Addis Ababa	11.3
1.2	School of Pharmacy	Pharmacists	12 + 5	Addis Ababa	6.5
1.3	Public Health College	—Health Officers	12 + 4	Gondar	22.5
		—Nurses	10 + 3		24.4
		—Sanitarians	10 + 3		20.2
		—Med. Lab. Technicians	10 + 1 or 2		(added to Lab. Tech. below)
2.	Ministry of Health				
2.1	School of Nursing	Nurses	10 + 3½	Addis Ababa Nekemte Asmara	57.6
2.2	Schools for the training of auxiliary health personnel	Pharmacy Attendants	10 + 2	Addis Ababa	6.3
		Med. Laboratory Techns.	10 + 1 or 2	Addis Ababa	17.4
		X-ray Techns.	10 + 2	Addis Ababa	5.5
		Health Assistants	10 + 1 or 2	Addis Ababa Dessie Jimma Awassa	380.4

* The average was calculated on the basis of the total number of graduates since the establishment of the institution, divided by the number of years since its establishment. Note that these averages are for the years before 1977, and substantial increases in student enrolment of the schools has taken place since then.

Source: (1) Data gathered from documents of the Ministry of Health, Training and Health Education Department. (2) Gebre-Emanuel Teka, The Public Health College and Training Centre, Gondar, (1974) was used for information regarding PHC graduates.

TABLE 2

Population per Health Worker Ratio for Ethiopia, as compared with that of some other Countries and the WHO Recommendation for Developing Countries(4)

Ser. No.	Type of Health Personnel	Population per Health Worker								
		Ethiopia (1978)			Ghana (1975)	Chile (1974)	Norway (1976)	Czech-oslovakia (1975)	Hong Kong (1975)	WHO Recommendation for Developing Countries (1961)
		Three Urban Centres	Rest of Ethiopia	Total						
1	Health Officers	13,585	151,304	93,184	–	–	–	–	–	–
2	Medical Doctors & Health Officers	3,361	81,992	34,737	–	–	–	–	–	–
3	Nurses	1,585	49,416	17,608	1,434	460	137	167	1,215	5,000
4	Midwives	?	?	99,840	7,236	7,638	5,724	2,311	777	–
5	Sanitarians	20,046	121,294	90,596	?	?	?	?	?	15,000
6	Medical Lab. Techns.	6,274	357,964	85,329	?	?	?	?	?	–
7	X-ray Techns.	23,152	1956,869	341,314	?	?	?	?	?	–
8	Pharmacists	24,534	1834,564	353,651	21,457	32,748	2,808	2,431	18,675	50,000
9	Pharmacy Attendants	25,289	838,658	293,530	–	–	–	–	–	–
10	Pharmacists & Pharmacy Attendants	12,453	575,550	160,399	–	–	–	–	–	–
11	Health Assistants	491	7,170	3,945	–	–	–	–	–	–
12	Medical Doctors (Physicians)	4,467	181,192	55,383	10,511	2,322	582	418	1,517	10,000

Note: – Note applicable ? Data not available

Source: (1) Data for Ethiopia are from Health Manpower Statistics, Ministry of Health, and Population Estimate for 1978 from Central Statistics Office. (2) Ratio for other countries is calculated from number of health workers for the indicated year, and population for the same year, given in the Statistical Year Book, 1977, UN publication. (3) WHO recommendation is from WHO publication, Education and Training of Health Personnel in Africa, 1961.

TABLE 3

Demand and Supply Data on Health Manpower in the Major Categories for the Period 1979-1990(5)

Type	Ethiopians available	Expected output by 1990	To fill present vacancies		For existing and planned expansion		For provision of reasonably adequate services	
			Required	Shortage	Required	Shortage (Excess)	Required	Shortage
	1	2	3	4	5	6	7	8
All Medical Doctors and Health Officers	365	1903(330/yr)	1,026	661	1,227	–(1041)	4,140	1,872
MD Specialists	30	140(20/yr)	441	411	569	399	1,240	1,070
Pharmacists and Pharmacy Attendants	91	825(75/yr)	303	223	360	– (556)	1,190	274
Nurses	1091	2000(250/yr)	2,947	1,856	3,518	427	8,280	5,189
Med. Laboratory Techns.	261	870(100/yr)	657	396	804	– (327)	1,930	799
X-ray Techns.	75	160(15/yr)	182	107	209	– (26)	1,370	1,135
Sanitarians	273	360(30/yr)	282	9	297	– (336)	1,920	1,287
Public Health Specialists	33	4	68	35	68	31	200	163
Health Assistants	3,625	5600(530/yr)	6,784	3,159	10,409	1,184	25,470	16,245
Community Health Agents	2,000	20,000(2000/yr)	25,000	23,000	25,000	5,000	50,000	30,000

Source: Present vacancies and additional requirements for planned modest expansion within 1979-1990 is calculated based on the new staffing pattern and expansion plan of the Ministry of Health. The last column represents a calculation by the writer based on the need to develop a health service with reasonable coverage of the population and meeting the minimum requirements of WHO for developing countries.

1.2 *Maldistribution.* Maldistribution is one of the most significant health manpower problems in many countries. The primary reason for maldistribution in health manpower is a maldistributed health service delivery system, which in turn is a reflection of the national policy of a given country, which again is based on the socio-economic and political system of the country. Associated with this is the fact that professionals prefer cities to rural areas, because of better living conditions and usually a better chance for personal and professional growth [1, p. 217], [2], [23, p. 208], [25, p. 82]. And thus, the great majority of the rural population, specially in the so-called "Third World" countries, do not get any share of trained health manpower. The situation in Ethiopia is one of the worst, and Table IV testifies to this fact [1, 2]. Note in this Table that Health Officers, Sanitarians and Health Assistants were trained primarily to work in Health Centres and Health Stations, which are chiefly in rural towns, and that is why their distribution shows a better picture when compared with the other professions.

TABLE 4

Rural-Urban Distribution of Health Personnel in Ethiopia, 1978

Ser. No.	Type of Health Personnel	Three urban centres (6% of population)		Rest of Ethiopia (94% of population)		Total (100%)
		No.	%	No.	%	
1	Medical Doctors	368	69.4	162	30.6	530
2	Health Officers	121	38.4	194	61.6	315
3	Nurses	1073	64.4	594	35.6	1667
4	Sanitarians	82	25.3	242	74.7	324
5	Med. Lab. Techns.	262	76.2	82	33.8	344
6	X-ray Techns.	71	82.6	15	17.4	86
7	Pharmacists	67	80.7	16	19.3	83
8	Pharmacy Attendants	65	65.0	35	35.0	100
9	Health Assistants	3347	45.0	4094	55.0	7441

Source: Number of health personnel for the three urbanized centers (Addis Ababa, Asmara, Dire Dawa-Harar) and for the rest of the country is taken from Health Manpower Statistics, Ministry of Health; and the population estimates are taken from the Central Statistics Office.

1.3 *Migration and/or Attrition.* The migration of trained or intending health workers is a world phenomenon and is better known as the "Brain Drain" problem. The exodus is largely from poor to rich countries, or from the developing countries of Asia, Africa and Latin America to the developed countries of the west [18, p.460]. The primary reason for such a high migration rate is incentive — the hope of a much better salary, better living standard, recognition and wide opportunity for

development. An associated reason is the so-called "standard" education, which suits the needs of the developed world rather than the local needs of the country of training. Post-graduate studies, research and work experience under taken in developed countries encourage and facilitate migration of health personnel of high calibre [10, pp.231-237].

Attrition refers to those who leave their profession for good — who change their health profession completely, who change to another discipline within the health sector, who disappear with no record to trace their whereabouts, or who are pensioned; it also includes all deaths. Since both migration and the so-called "attrition" cause loss to the profession, they are treated together in this paper. Good examples of attrition are those Nurses who become secretaries or housewives, or sanitarians who retrain to become veterinarians. The primary reasons for attrition other than that caused by pensioning or death are the same as those cited for migration. The people affected often find that other equivalent professions provide better incentives than their own.

The importance of information on migration and attrition is to calculate expected losses for manpower projection, and also to attempt to minimize them if the magnitude is high. The migration/attrition rate for each category of health professionals is shown in Table V.

2. QUALITATIVE HEALTH PROBLEMS OF ETHIOPIA

2.1 *Lack of Progressive National Policy.* In most instances, qualitative problems are closely related to the political system of the country. In countries with ideological commitment to the well-being of the broad masses, the training of a large number of health personnel with as short a training period as possible, and with the content of training based on the concrete health problems and needs of the people, seems to be a universal fact [10]. On the other hand, many countries train the classical kind of health personnel, usually with a long and rigorous training in health and disease, whether those particular examples are the problem of that particular country or community of the trainee or not, based on the so-called "International Standard". Thus, usually there is no plan for the kind of health personnel needed, nor any attempt to make the training relevant to the changing needs of the community. The presence of a national policy on the level and purpose of each category of health personnel based on the actual needs of a given country is an essential directive for a relevant health manpower training scheme [8, p.433-441], [25].

There was no such policy in Ethiopia until 1975, when the National Democratic Revolutionary Programme came into being — and the need for relevant health manpower development has now been indicated in

TABLE 5

Migration/Attrition Rate of Trained Ethiopian Health Personnel, 1978

Ser. No.	Profession	Migration/attrition rate	Remarks
1	Medical Doctors	56/290 – 19.3%	Most have migrated
2	Health Officers	40/430 – 9.3%	17 cases are caused by death
3	Community Nurses	25/464 – 5.4%	
4	Nurses (Hospital)	265/1514 – 17.5%	Most have migrated
5	Sanitarians	73/403 – 18.1%	Most changed their profession
6	Med. Lab. Techns.	54/401 – 13.5%	
7	X-ray Techns.	6/92 – 6.5%	
8	Pharmacists	23/105 – 21.9%	
9	Pharmacy Attendants	13/113 – 11.5%	
10	Health Assistants	37/7478 – 0.5%	Data may not be complete

Source: Calculated from Health Manpower Statistics, Ministry of Health, 1978.

general terms giving a useful guideline. Henceforth, curriculum changes embracing a short period of training and more relevant education have been worked out [3,4,5] and Table 6. The content of the curriculum is based on the cardinal points mentioned in the NDRP concerning health, which are that "there will be a fair distribution of health services to all the population with emphasis on the rural areas. Health education and preventive measures, especially the control of communicable diseases, is to be given priority. The training of all categories of health workers shall be based on the actual need of the country" [22].

In concurrence with the priorities spelled out in the National Democratice Revolutionary Programme, the Ministry of Health has drawn up the following basic principles for health manpower development [15].

(a) "Self Reliance" (i.e., the use of all available local resources to train health workers in order to meet the growing demand for services) shall be the basic guideline for the planning and implementation of health manpower development.

(b) The training of health workers shall be based on a concrete analysis of the health problems of the country.

TABLE 6

Present Duration of Training and Educational Background of Health Personnel in Ethiopia, 1978

Profession	Educational Background	Duration of Training
Medical Doctors	12th grade completed	5 years
Pharmacists	12th grade completed	4 years
Nurses	10th grade completed	2½ years
Med. Lab. Techns.	10th grade completed	
Junior		1½ years
Senior		2 years
X-ray Techns.	10th grade completed	1½ years
Sanitarians	10th grade completed	2½ years
Pharmacy Attendants	10th grade completed	1½ years
Health Assistants	8th grade completed	1½ years
Kebele Health Representative	Reading and writing	3 months

Source: (1) Curriculum of Health Personnel, Ministry of Health, 1976. (2) Curriculum of undergraduate Medical Education, Addis Ababa University, 1971. (3) Curriculum Undergraduate Pharmacy Education, Addis Ababa University, 1971.

(c) The training of health workers shall integrate theory with practice.

(d) The training of health workers shall include proletarian ideology, so that they will be able to serve the broad masses with dedication.

(e) The recruitment of health workers to the different health professions shall be conducted by mass organizations among the broad masses.

(f) The training of health workers at all levels must be short and relevant, but also continuous.

(g) The objective of training of health workers shall primarily be for serving the broad masses and not for self-aggrandisement.

2.2 *Socio-economic underdevelopment.* In many cases it is beyond the resource of developing countries to train and maintain health professionals of so-called "high standard". It is very expensive to train throughout the long-duration curricula requiring highly skilled teaching manpower and facilities. Furthermore, it takes quite a large amount of money to establish and maintain health services staffed

with such personnel, and thus it demands a high service charge from the consumers even in those places where it is available. As Maurice King puts it in his book, *Medical Care in Developing Countries*, "What is the use of medicine if the sick are denied it?" [1]. It should also be mentioned that many times those people who are expensively trained to a high standard often do not want to work in rural areas, and, even if they do, they have difficulty in relating with being accepted and being understood by the traditional societies in the rural areas, because of the wide socio-economic, cultural and educational gap created between the professional and the people [11]. It is now a clearly established fact that health is much more affected by socio-economic development than by health services, and thus a health delivery system, and with it health manpower development not directly related to the socio-economic situation of the country, is meaningless and cannot be effective. Therefore, health plans should be integrated with general development of the society [17, pp. 447-454].

To give a practical example of how expensive it is in Ethiopia to train physicians in the medical school, before 1976 it used to require 50,000 Birr per annum per student[3]. Similarly, hospital services cost 19 Birr per day per bed[4]. This is an enormous sum when compared with the annual per capita income of 192 Birr [24].

2.3 *Uneconomic Utilization of Health Manpower.* Over and above the serious shortage of health manpower, there is a problem of proper utilization of whatever is available in many countries.

There is a lack of a clear-cut job delineation for each different category of health worker, and in many instances highly skilled manpower is utilized unnecessarily to care for minor health problems. Because of the lack of properly co-ordinated referral systems, the few specialists we have serve in the out-patient departments of a few hospitals, and many nursing care and nursing administrative assignments which could be handled by less skilled manpower consume the time and work of most of the inadequate number of nursing staff available. These are only two examples of uneconomical utilization of health manpower. If we consider another dimension of health manpower development, we find that almost all health workers are engaged in curative services to the sick, because the emphasis is at the moment necessarily placed on cure rather than on prevention[5]. High investment from whatever funds are available is put into curative medicine, and there is usually no budget for preventive or health promotive services. If we look into a breakdown of a Health Centre budget, we find that 61% is for salaries, 24% for drugs, 14% for administrative costs, and only 1% for what is referred to as Health Education and Demonstration. And this institution is said to amalgamate both curative and preventive services. Hospitals have no budget of any sort for public health activities.

Another aspect of uneconomic utilization is the misplacing of many trained health personnel in posts where they cannot give direct services for the improvement of health, and in private commercial enterprises where "health care" is not the primary concern.

A general idea of the health manpower utilization pattern in Ethiopia is given in Table 7.

The great majority of health staff are used in curative services alone, while the Health Centres, which are supposedly providing both curative and preventive services, are badly understaffed.

TABLE 7

Health Manpower Utilization by Category of Health Personnel in Ethiopia, 1978

Place of Work	Category of Health Personnel								
	M.D.	H.O.	Pharmacists	Pharmacy att.	Sanitarians	Nurses	Lab. Techns.	X-ray Techns.	Health Assistants
Clinics/Health Stations	13	10	–	3	3	48	14	–	1321
Health Centres	–	144	–	–	118	189	31	–	408
Hospitals	402	32	13	45	28	1018	147	71	22 65
R.H.D. & Head Office	11	37	12	10	28	12	9	–	7
Teaching Institutions	24	13	5	–	18	108	16	2	52
Specialized Projects	18	33	17	3	75	19	64	4	201
Army and Police	46	15	2	4	5	159	39	9	2112
Private Enterprises	7	8	26	35	5	43	2	–	952
Other Organizations	9	23	8	–	44	71	22	–	123
Total at Work	530	315	83	100	324	1667	344	86	7441

Source: Health Manpower Statistics, Ministry of Health, 1978.

2.4 *Imbalance between different disciplines.* Very often the question of how many should be trained from each category is not set as a target; and this is not expected from an improperly planned general development system. In the health sector, essential categories to undertake the many responsibilities of health work are usually underproduced. The concept of a well-balanced pyramidal development with a few top-qualified personnel at the apex, and less and less highly skilled workers as we go

down to the base is accepted as the best in theory, but ignored in practice. The concept of teams, with a proper ratio for effective and efficient complementary duties is not well implemented [21, pp. 364-395]. The ratio of how many nurses are needed for every doctor or health officer, how many health assistants are needed for every nurse, how many laboratory, x-ray or pharmacy technicians are required in relation to physicians and health officers has never been thought of in the past. For example, the production of health officers, community nurses and sanitarians has up to now been almost 1:1:1 in ratio. In fact, if we consider actual utilization, sanitarians come lower than one in ratio. Pharmacists and pharmacy attendants are so underproduced that nurses or other categories of health worker are obliged to cover the services, and equal competence is not likely. The sum of 13 pharmacists and 45 pharmacy attendants in all hospitals does not allow the distribution of even one for each hospital. There is a serious imbalance also in the production of medical laboratory technicians, and as indicated in Table 7, only 31 of the 110 Health Centres can employ even one. It should also be mentioned that certain areas are completely forgotten or underestimated in Ethiopia, and the number of trainees from foreign schools is few, for example, pysiotherapists, dental technicians, optometric technicians, anaesthetists, etc.

2.5 *Lack of Relevance.* Relevance in this context refers to the question whether the educational programme is directed towards producing personnel geared to cope with existing health problems or not [1, 10], [12, pp. 464-467], [21, 25].

Are the contents and process of medical education based on the practical conditions of the community? This question may sound simple to answer, but in actuality it states the most complicated problem in the development of health personnel. Very often there is a lack of integration and/or coordination between the needs of health services and trained manpower. In many cases, the Training Institutions are different from the Health Service Institutions, and thus academic objectives do not coincide with health service objectives, and this creates the problem of relevance, making both the quality and quantity of health manpower training non-reflective of the needs and demands of the consumers.

The problem is exemplified by the uncontrolled production of health assistants by individual hospitals, the training of medical doctors, health officers, community nurses and sanitarians within the university, where the Ministry of Health had no significant involvement in their training until recently.

Even those institutions under the Ministry of Health did not previously have well-defined and specific objectives for the type and number of health personnel to be produced; these points should have been laid down by the Health Service Department of the Ministry.

2.6 *Lack of a Personal and Professional Development Scheme.* The problem of development is a big issue in the minds of trained manpower. Quality improvement through practice and continued refresher training is essential for efficiency and effectivity of the manpower, but all too often this is not emphasized. Lack of incentives, including professional growth, transfer after a set of work in a given place, better living conditions, good pay, etc., lead to serious job dissatisfaction, increased rate of migration/attrition and inefficient performance. When we consider the Ethiopian situation, there has been no planned system of development for health workers, thus leaving them with the sense of being in a "dead-end" job [21].

3. CONCLUSION

If we briefly consider the general health conditions in Ethiopia [15], we find the following facts: Infant mortality rate is estimated at 155/1000, meaning that one-fifth of the babies born alive die before reaching their first brithday; and this is about 20 times higher than in developed countries (Infant Mortality Rate in 1975 was recorded as for Hungary 32, Netherlands 10.6, U.K. 16.3, Finland 11.1, Kenya 65.9, Nigeria 62.0 per 1000.) Child mortality rate is estimated at 247/1000, which in absolute numbers amounts to nearly half a million deaths of children of 0—4 years of age, yearly; maternal mortality rate is estimated at 20/1000, while the corresponding figure for developed countries is as low as 1-2/10,000. Note that, in Ethiopia, 60% of all deaths are maternal deaths and the death of children below five years of age. Life expectancy is estimated at 43-44 years, while in the developed world it is above 70 years.

Because of the general unhygienic living conditions of the people, coupled with the lack of knowledge and means to take appropriate measures to deal with health problems, Ethiopia harbours almost the full range of infectious diseases. About 80% of the diseases are of communicable nature, which can be prevented by the technically simple measures of improving water sources and excreta disposal, controlling insect vectors, providing vaccinations, changing the health habits of the people, especially in personal and environmental hygiene, child feeding, etc.

The following represent the top eleven health problems in ethiopia today: nutritional deficiency diseases, childhood diseases, diarrhoeal diseases, helminthiasis, veneral diseases, malaria, trachoma and other eye diseases, leprosy, tuberculosis, bilharzia and louse-born diseases. Despite the high prevalance of preventable diseases, expenditure on health is allocated largely to comparatively sophisticated, disease-oriented, institutional care of individual patients in the capital and a few other large cities, leaving the majority of the population unserved by any kind of modern facilities. To be

more specific: by 1979, for an estimated population of 30 million, there are 84 hospitals with 9,297 beds (of which 45% are concentrated in three urban centres), 112 Health Centres and 1,241 Health Stations (633 of which have been build since 1974) [6]. All the above institutions combined serve not more than 20% of the country's population.

It is against this background that the need for a new approach in health care stands out as absolutely necessary, together with the development of health manpower to fit into the new scheme. Perhaps the most important of all is the plan to develop primary health care at Peasant Association and Kebele Association level, to be led by Community Health Agents to be selected by their respective community and to be trained for about 3 months. The health activities are to be carried out with the full involvement of the people and to be supported by the community. In addition, the new curricula for the training of health personnel, both at university level and otherwise, will reduce the training period and make the training more relevant to local needs; Gondar Public Health College has been converted to a second Medical School for the training of physicians; three new Health Assistant schools have been opened, respectively at Awassa, Dessie and Jimma. These are a good start — but only a start — in the long and arduous job of developing an appropriate and adequate number of health manpower. The attempt being made by the Planning and Programming Bureau of the Ministry of Health to identify the type and number of health personnel, with their utilization and distribution pattern in the country, and to determine needs on the basis of shortage in existing health service delivery units, with some provision for future expansion in these services, is also a step forward in the right direction for planned health manpower development [14].

However, these attempts are still isolated from the general development strategy, and are fragmented, primarily because of the lack as yet of a comprehensive National Development Plan. Thus, the need for a well-integrated, coordinated and systematic approach for health manpower development is as great as ever before. The overall goal of health manpower policy should be to coordinate national efforts to satisfy the health needs of the entire population, through health services composed of balanced teams of health personnel. More emphasis has to be placed on treating health manpower planning as a continuous process, consisting of (i) a plan for health manpower development, (ii) steps to facilitate the implementation of the plan; and (iii) the organization of the complex planning process itself. Moreover, in a dynamic and changing situation as found at present in Ethiopia, plans have often to be revised because many of the actual conditions are in a state of continual change. Generally speaking, then, a logical and flexible chain of action is needed in respect of each of the three main components of health manpower development process: planning, production, and management. The integration of these main components into a single process, closely

linked with the development of health services, is a fundamental requirement in the success of health manpower development. It must be very well understood that the type and number of health personnel needed should be determined on the basis of sound information, which includes an assessment of the present health status of the population; ascertainment of the social, economic, and demographic factors that affect — and will in future affect — health and disease; and identification of the services that should be provided accordingly at all levels. Within the framework of existing and potential resources, expectations of the population, and present and prospective demands on health services, it is also necessary to ascertain the competence needed to provide these services by means of a task analysis, and to plan educational programmes designed to train the necessary manpower [8].

A permanent non-rigid mechanism for the integration of health services and health manpower development is a basic need as indicated above.

It must be stressed again that implementation in the production of the required type of health personnel is highly dependent on the educational methods utilized, and on the proper orientation offered to trainees in schools. Therefore, the development of teaching staff in the health sciences, with competence in the learning/teaching process and devotion to community-oriented objectives is imperative [13]. There is need for a health manpower group which will look into the planning, development, management and proper utilization of balanced health teams, in addition, it must be able to develop an acceptable mechanism to continuously monitor whether health personnel are functioning properly, and adjust the planning and production system on the basis of such monitoring.

We must also be able to cope with the problem of job dissatisfaction, to ensure maximum effectivity and efficiency. Apart from the obvious need to improve the management of health manpower, including the present unjust salary scale[6], there is need for proper orientation in the theory and practice of scientific socialism, in order to rouse the consciousness of the workers to their responsibility towards the health needs of their society, and to recognition that their work effectively contributes to the general development of the community [16].

In addition, concurrent with the overall policy affecting civil servants, an appropriate system of social benefits should be instituted; this should include moral and financial recognition of achievement, based on a systematic review of living and working conditions; a system of continuing education to maintain and improve performance in relation to the health needs of the population; a properly organized career structure, with fair means of advancement and the possibility of transfers and promotion; and finally a system of constant technical support and supervision at all levels. This should also help as a strategy to reduce migration and/or attrition of health manpower, for it will allow health workers to obtain the satisfaction in their work that they tend at present to seek elsewhere.

Even though it is evident that the yardstick for measuring the effectiveness of the health manpower development process described above is the determination of the extent and results of its contribution to the development of health services, and thus to the improvement of the health status and quality of life of the population a more modest, less complicated and inexpensive but sound evaluative model needs to be developed if we are continuously to monitor our progress. Attempts to carry out extensive scientific evaluation research have been minimal, primarily because of the immensely complex procedures and expenditures which such research requires, in order to measure the achievements of health services. Despite such a handicap, the need to make a systematic evaluation is greater than even before. In order to surmount this hurdle, a simpler methodology of evaluation has to be developed. The model drawn up in Table 8 is an attempt to develop such a methodology.

This model is based on the basic assumption that health outcomes are the result of performance — processes and approaches utilized — by the health workers. Therefore, if and when the direct relationship between this performance and health outcomes are established by means of a scientific investigation, then the kind and level of performance can in future be used for the evaluation of health services. This will then lessen the complexity of the health status measurement needed to evaluate the efficiency and effectivity of health services, which will be needed only once in a while to monitor our evaluation methodology. Otherwise, performance assignments will provide us with the necessary indications for improvement of services, changes in health workers' training curriculua, etc. The areas of performance, activities and health status outcomes directed primarily towards maternal and child health (the most sensitive health indicators, and also the priority health problem of the country) which are to be measured, scored and correlated are given in the following Table [7]. However, the model has to be developed further, especially with regard to establishment of a scoring system and identification of the criteria of good performance (Table 8).

Finally, it must be stressed that proper health manpower development is an integrated continuum of planning, production and management. Unless and utnil these three components are dealt with in a scientific way, reflecting the overall socio-economic and political development and based on the major health needs and demands of the people, the problem of health manpower will continue to exist; and, in most instances, it is bound to worsen. Through appropriate and continuous evaluation, improvement of the effectivity and efficiency of health workers' performance is an essential component of the process of proper health manpower development.

TABLE 8

Process and Outcome Items for Possible Correlation in the Evaluation of Health Services

Ser. No.	Basic Policy 1	Implementation 2	Ser. No.	Social/Behavioural 3	Ser. No.	Ultimate health outcome 4
1	Community Diagnosis is carried out by the health institution (i.e., identification of problems, felt needs, networks of influence, etc.)	–Degree to which community diagnosis findings are used in planning and implementation of health activities –Degree to which activities are carried out through cooperation and coordination with community organizations, their leaders, other private and government agencies	1	The Scientific level of the health knowledge, attitude and practice of the community (e.g., knowledge, attitudes, and practices as related to maternal and child health)	A	– Extent of reduction in morbidity rates of :
					1	puerperal sepsis and other complications of pregnancy and child birth
					2	Faetal and neonatal accidents (e.g., asphyxia due to prolonged labour).
2	Community "perception" considered in action plans (i.e., beliefs, attitudes, values and, in general, the cultural traditions of the community are taken into account)	Extent to which community "perception" is used to shape "action plans" and approaches	2	The level of personal and community hygiene (e.g., personal cleanliness of children and parents, environmental health conditions, etc.)	3	Gastro-enteritis in childern 0-4 years of age
3	Community representatives take part in the health action plans and implementations	–Extent to which community members participate in health affairs (e.g., in health councils) –Degree to which community groups participate in organized health programmes (e.g., Womens's Club for Health, Mother's class, Youth Health action, etc.)	3	Extent of health service utilization (e.g., attendance rate to antenatal care, child care and delivery services), including degree of continuity and regularity	4	Protein-calorie malnutrition in children (e.g., marasmus, kwashiorkor) and other nutritional deficiencies (e.g., rickets, Bitot's spots)

TABLE 8 *(Continued)*

Ser. No.	Basic Policy 1	Implementation 2	Ser. No.	Social/Behavioural 3	Ser. No.	Ultimate health outcome 4
4	Group decision-making is accepted as a working principle	Extent to which group decision-making is practised effectively (e.g., regularity of planning and review meetings, group approval of major activities)	4	Number of children and pregnant mothers protected from diseases by following appropriate schedule of immunizations (e.g., DPT, BCG, polio, measles & TT)	5	Intestinal parasities in children of 0-4 years of age (e.g., a scarides, trichuris, hookworm, schistosoma, etc.)
5	Proper conflict-resolving mechanism is built into the administrative set-up	Extent to which the conflict-resolving mechanism has been used to maintain good working relationship among all health workers of different disciplines	5	Level of group (Health Institution staff) cohesion	6	Mothers and children affected by common communicable diseases in the area (e.g., malaria, tuberculosis, measles, pertussis, polio, etc.)
6	In-service training for personnel, and educational activities on health matters to the community are performed	Extent to which in-service training is carried out for staff and local health practitioners, and how far personal and non-personal methods of health education are used to inform the community and change behaviour	6	Extent to which indigenous health practitioners have stopped their most dangerous practices, adopt new useful ones and cooperate with health institutions (e.g. trained traditional midwives modifying their practices as related to pregnancy, childbirth, child care, etc.)	B	–Extent of reduction in mortality of :
					1	Infant mortality rate
					2	Neonatal mortality rate
					3	Perinatal mortality rate
					4	Child (0-4) mortality rate
					5	Maternal mortality rate
7	Maintainance of good and continued functional relationship with community sought	Degree to which trust, respect and confidence between health workers and community is established; and extent of follow-up of cases through visits, etc.	7	Number of mothers who adopt proper infant feeding, weaning and other child care practices		

TABLE 8 *(Continued)*

Ser. No.	Basic Policy 1	Implementation 2	Ser. No.	Social/Behavioural 3	Ser. No.	Ultimate health outcome 4
8	Constant evaluation of programmes and activities conducted	Extent to which evaluation is conducted, results are used to modify activities (services) to meet new needs and deal with identified problems	8	Extent of continued and regular, repeat visits by attendants for antenatal and the underfives clinic	6	Whenever possible, mortality rate related to specific disease(s) prevalent in the area
9	Highest possible standard of diagnosis and treatment is maintained	Degree of utilization of available diagnostic facilities (Lab., etc.) and level of correct diagnosis, prescription, follow-up, or referral	9	Number of patients seen; diagnosis established, or not established; treatment prescribed and given or not given; referral cases and results of follow-up		
10	Regular and continued supply of drugs and equipment, proper financial, administrative and supervisory support secured	Regularity of supplies and appropriateness of budgetary allocations, strength of administrative support and frequency of supervision.	10	Extent to which patients understand and accept knowledge about the nature of their illness, its cause, prevention and follow-up of treatment		

NOTES

1 The total number of health professionals at work and not necessarily providing direct medical service is used to calculate the ratio. Figures for other countries and the WHO recommendation are used only to provide a general and rough global situation for comparison. However, they should be interpreted carefully, as the ratio is meaningless if the professionals are not working in the health field, directly supporting health, and well-distributed among the population.

2 The needs indicated to fill present vacancies and for planned expansion in the period 1979-90 are based on the new staffing pattern and modest expansion plans of the Ministry of Health. The shortage shown in provision of reasonably adequate service was calculated on the basis of good coverage as envisaged by previously planned 1 Health Centre for 50,000 population; 1 Health Station for 10,000 population. It also envisages a ratio of 1 Central Hospital: 2 Regional Hospitals: 3 Rural or Medium Hospitals. The bed capacity expected for Central, Regional and Medium Hospitals is on the average 80,200 and 400 respectively. The staffing pattern requirements for each Central Hospital (about 20 in number) includes 20 general practitioners, 26 specialists, 92 nurses, 16 laboratory technicians, 8 X-ray technicians and 184 health assistants; these Central Hospitals are specialized teaching, research and referral Medical Centres. The Regional Hospitals, about 40 in number, each require 10 general practitioners, 12 specialists, 44 nurses, 8 laboratory technicians, 4 X-ray technicians and 88 health assistants; these are intermediate referral, training and research hospitals. The Rural Hospitals (about 140 in number) each require 4 general practitioners, 2 specialists (a surgeon and a paediatrician), 12 nurses, 4 laboratory technicians, 2 X-ray technicians, and 24 health assistants. Health Centres each require 2 MDs, 4 nurses, 2 sanitarians, 4 health assistants, 1 pharmacy attendant, 1 medical laboratory technician, and 1 X-ray technician. 810 Health Centres are required. A Health Station requires 3 health assistants – and 4,050 Health Stations are needed. When this is realized, the WHO minimum requirement for developing countries in terms of health manpower (see Table 2) will almost be met and there will be 1 hospital bed per 1500 population. (The WHO recommendation for Africa is 1 hospital bed for 1,000 population.) The ratio per bed in 1975 in Ghana was 599, in Sudan 982, in Cuba 234, in Czechoslovakia 99, and in Sweden 66. Please note that shortage in various other fields (of physiotherapists, opticians, dental technicians, anaesthetists, statistical clerks, hosptial administrators, midwives, paediatric nurses, etc.) are not indicated. Furthermore, the needs of the Armed Forces, the huge drug business, school health services, and occupational health services have not been considered.

3 Calculated from ten years' total expenditure on the running of the Medical School, divided by the number of students enrolled during the same period.

4 Personal communication with the Planning and Programming Bureau, Ministry of Health.

5 The Health Centre staff, who should presumably emphasise prevention, spend less than 20% of their time in preventive activities.

6 Serious dissatisfaction with the "unfair salary scale" (specially drawn up for health personnel only) developed in July 1970 has been expressed in several forums and documents both by the health professionals, their professional associations and officials of the Ministry of Health.

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THE EFFECTS OF SOCIALIST TRANSFORMATION ON THE FERTILITY OF THE RURAL POPULATION OF ETHIOPIA

Bruce Mackay*

ABSTRACT. Drawing on the experience of pre-revolutionary Russia, Poland, India, the Philippines and Kenya, an attempt is made to assess the implications the 1975 Land Reform will have on fertility in rural Ethiopia. The experience of these countries strongly suggests that in the short run, the 1975 Land Reform will have a powerful positive effect on the fertility of the rural population. Change in favour of smaller families will set in once the peasant mode of production becomes progressively socialized.

Most discussions of future population growth, in Ethiopia or elsewhere, are based on projections of past and present trends. They assume that certain specified changes in certain variables will occur, but usually at a steady incremental rate. Because of this, they are unable to incorporate the possible effects on fertility, mortality and migration of sudden, structural changes in the society under discussion. Such a change has occurred in Ethiopia since 1974, and it seems unlikely that this will have no significant effects on some or all of these variables, and thus on the rate of population growth. This paper is concerned with the possible effect, on fertility only, of the original 1975 land reform and of the moves towards the creation of cooperatives announced in 1979. The nature of the land reform will certainly have an impact on migration; and other changes indirectly associated with the land reform and cooperative programme will affect fertility, mortality and migration — the money spent on a mass-based public health programme, for example, will reduce mortaility faster than the same amount spent on the elitist, curative and urban health programmes of the old regime. Better nutrition amongst the peasantry, which is almost certainly a result of the land reform, will likewise help to reduce mortality, and is likely also to raise fertility sufficiently to counteract the extent that diseases associated with malnutrition contribute to infertility.

But our concern here is with the direct effect on fertility made by the structural changes brought about by the revolution, notably of the equality of incomes and landholding, of changes in the relations of production, and of changes in the position of women and of children.

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Most people seem to believe, along with the United Nations:

> "That the poor have more children than the rich is a well-established fact" [13, p.85].

This is true up to a point, but it depends very much on how you categorise people as "rich" or "poor". If you compare the family size of an urban professional (rich) with that of a farmer (poor), then you will certainly find that income and family size are inversely related. But the category "farmer" is not an adequate basis for making such judgements in a country such as Ethiopia, for the 90% of the population who are farmers are not an undifferentiated mass, or at least were not before the land reform. Farmers as a group may be significantly poorer than certain other groups in the population, but this does not mean that they are all equally poor. In all peasant societies,* there is considerable inequality within the peasantry itself; some have more land and have higher incomes than others, and these differences are often large. So if we confine our conclusions to "the peasantry", does the inverse relation between income and family size still hold? It does not, and in the following Tables we show that, in societies as seemingly different as those of pre-revolutionary Russia, India in the 1930s and contemporary Kenya, there is, within the peasantry, a strong and consistent positive association between family size and income/landholding.

TABLE 1

Pre-Revolutionary Russia
Area under cultivation and size of household, Perm Gubernia, Russia, 1894
(Sample – 23,574 households)

Area cultivated (desyantinas)	% of households	Persons/household
None	10.2	3.51
Up to 5	30.3	4.49
5 – 10	27.0	5.44
10 – 20	22.4	6.67
20 – 50	9.4	7.86
Over 50 – 60	0.7	9.25
Mean 9.80, Standard deviation 3.20. Skewness 0.13		

Note. One desyatina equals about 1.1 hectares.

Source: V.I. Lenin, ***The development of capitalism in Russia***, (Progress, Moscow, 1974), pp. 108, 109.

* There is no agreed definition of "peasant society", and considerable debate as to whether we can usefully speak of a "peasant mode of production". On the first point, there is some agreement that peasants (a) have access to land, (b) rely on family labour, and (c) are never a "whole society", but always subjected to surplus-extraction by a dominant mode of production, whether feudal, capitalist or socialist. As for the peasant mode of production, it is clear that the peasant family is the basic economic unit of the society, and that there are relations of exploitation within the family itself. For discussion of these problems, see [4,7,8,9].

Lenin concluded from his study of this and other samples:

> "We see that everywhere the size of the families of the well-to-do peasantry is above the average and that of the poor below the average" [5, p. 135].

TABLE 2

Poland, 1890-1948
Number of children born by 1948 to mothers of different ages, by landholding
(Sample – 14,100 women)

Landholding (hectares)	Average number of children of mothers born in 1855-80	1891-94	1898-1900	1905-06	1911-12	1922-29
0 – 0.5	4.74	4.12	2.85	2.91	2.54	1.31
1 – 2	6.21	4.77	2.78	3.37	2.80	1.40
3 – 4	7.01	5.11	4.32	3.61	2.93	1.45
5 – 7	7.67	5.34	4.71	3.77	3.01	1.49
10 – 15	8.57	5.67	5.28	4.10	3.19	1.55
Mean	5.5	5.2	5.7	5.2	5.0	5.0
Standard deviation	4.5	4.4	4.5	4.4	4.4	4.4
Skewness	0.1	0.1	0.1	0.2	–0.2	0.2

Source: W. Stys, "The influence of economic conditions on the fertility of peasant women", *Population Studies*, 11, 1957, p.141.

TABLE 3

Size of farms and number of living children, Poland 1948

Size of farm (hectares)	Average number of living children
Up to 0.5	3.62
0.5 – 1.0	4.07
1.0 – 2.0	4.42
2.0 – 3.0	4.72
3.0 – 4.0	4.90
4.0 – 5.0	5.25
5.0 – 7.0	5.44
7.0 – 10.0	5.91
10.0 – 15.0	6.16
15.0 – 20.0	6.83
20.0 – 30.0	7.25
30.0 – 50.0	7.67

Mean 12.5, Standard deviation 12.5, Skewness 0.06

Source: W. Stys, "The influence of economic conditions on the fertility of peasant women", *Population studies*, 11, 1957, p. 136.

Stys wrote:

"The most important conclusion reached is that rich peasants have much larger families than those who are poorer" [10, p.137].

TABLE 4

India, 1930s
Differential fertility in the Punjab, 1934-35

Income in rupees/annum	Agriculturalists No. of children		Non-agriculturalists No. of children	
	born	surviving	born	surviving
Below 200	4.87	3.24	4.82	3.08
201 – 400	5.04	3.48	5.12	3.39
401 and above	5.29	3.70	5.27	3.72

Source: Colin Clark, *Population growth and land use* (St. Martins, New York, 1967), p.190.

TABLE 5

Philippines, 1950s
Total fertility of wives ages 45 and over, by landholding

Size of holding (hectares)	Total fertility
Up to 1	5.1
1 – 2	6.8
2 – 3	7.6
3 – 4	9.3
Over 4	7.9
Mean 2.80, Standard deviation 1.50, Skewness 0.02	

Source: Colin Clark, *Population growth and land use* (St. Martins, New York, 1967), p.192.

TABLE 6

Kenya, 1960s
Gross annual income (all sources), by household size, in Central Province, Kenya, 1963-64

Income (K. shs)	% of households	Average Household size
Under 1000	41.5	3.9
1001 – 1500	20.9	5.9
1501 – 2000	14.4	7.1
2001 – 2500	8.0	8.2
2501 – 3500	5.8	8.6
3501 – 5000	5.1	8.9
Over 5000	4.3	9.6
Mean 1493.75, Standard deviation 1207.49, Skewness –2.1696		

Source: Government of Kenya, *Economic Survey of Central* *1963-64*, (Ministry of Economic Planning, Nairobi, 1968), pp. 39, 44.

TABLE 7

Ethiopia, 1970s
Gross annual cash income, by household size, Chilalo, 1972

Income, $ Eth.	No. of households	Average household size
Up to 500	5	4.60
501 – 1000	32	5.67
1001 – 1500	31	6.35
1501 – 2000	10	5.11
2001 – 2500	11	8.69
2501 – 3000	3	8.67
3001 – 3500	2	7.40
3501 – 4000	4	11.53
Over 4000	5	9.62

Source: Johan Holmberg, *Survey of consumption patterns in Ettaya*, CADU Publication No. 90, 1973, p. 35.

Before we consider the implications of these Tables, some cautionary notes are in order. First, the data from Ethiopia is included simply to illustrate the general point – the sample is tiny, it refers to cash incomes only, and to an untypical area of Ethiopia. Secondly, the data from Ethiopia, Kenya and Russia refers to "household size", and not "family size" (even though Lenin incorrectly makes conclusions about "families"). In many peasant societies, it is common for richer families to have relatives living with them, and for poorer families to send members to richer relatives, so the difference in family size is probably less than the difference in household size. Thirdly, richer peasants have slightly lower infant and child mortality than poorer peasants, so their larger families are in part due to more survivors rather than to more babies. But none of these effects is sufficient to explain the consistent difference in family size or household size between richer and poorer peasants. And the data from Poland, which was collected by a professional demographer with an eye for such interefering factors, shows a clear and consistent positive association between landholding and fertility.

How to explain this association? And in the light of an explanation, what are the implications for the fertility of the rural population of Ethiopia, where the land reform has removed the inequality of landholding in each community, and where the peasants' associations are to be transformed into producers' cooperatives?

The basic social unit of the peasantry is not the individual, not the village, not the class, but the family. It is the family which has a right to the land, it is the family which provides the labour force to work that land, and it is to the family that income accrues. In a largely hostile environment,

where landlords, tax-collectors, the weather and "outsiders" in general dominate the precarious well-being of the peasantry, the peasant has secure control over only one factor of production, namely labour — family labour. This fundamental feature of the production process produce a general pressure for high fertility, and accounts for the fact that, as a group, the peasantry has a larger average family size than other groups in the population.

This pressure for high fertility is socially controlled within the peasant community. No human population reproduces to its biological maximum, and peasants are no exception. In a variety of ways, the poorer peasants of any given community have fewer children than the richer ones. The differences in the Polish data, for example, are wholly accounted for by the poorer women having their first child at a later age than do the richer women; and by the poorer ones having their last child at an earlier age. Poorer women may also resort to abortion more often, the intervals between each birth may be longer because they abstain from intercourse for longer after each birth, or because they breast-feed the baby themselves for longer than do the richer women. Poorer women are probably also more liable to "natural" factors, such as infertility due to disease or malnutrition, and they may die before reaching the end of their reproductive years more often than do richer peasant women.

We must seek for a material basis to such social forces which seem to exercise so strong and consistent an influence over so vital an area of human behaviour. The answer lies in the "family", which is not the cosy, conflict-free unity which often appears in the sociological literature — or at least, not the peasant family. There are clearly relations of domination and subordination within the peasant family, resting on relations of economic exploitation; exploitation of children by adults, and of females by males. Those who profit from the labour of others have economic power, and with that power comes the power to establish their own ideological interests as the prevailing ideology of the community of which they are the most powerful members. The family size of peasants is determined not by their absolute level of land-holding or income, but by its level relative to the other members of the community. While it is in the interest of all peasants to have relatively high fertility, it is the interests of the richer ones to make sure they have higher fertility than the poorer ones, for, as we have noted above, it is labour, family labour, which is the resource over which the peasants have most control.

Why it is men who normally dominate women, in peasant and non-peasant societies, is too complex a matter for this paper. But few would deny that within the typical Ethiopian, or Kenyan, or Indian family, men exploit women, in the sense that the flow of surplus value is from women to men. The surplus value of children's labour certainly accrues to the adults, and it is clear from many surveys of labour inputs on small farms that children contribute a significant proportion of total family labour [2, 11, 12].

To account for the decline in fertility which has occurred among the rural population of many parts of the world, we must look not to changes in quantitative indicators (such as increased incomes or increased literacy or reduced mortality), but to a qualitative change in the mode of production and hence in the relations of production. In a variety of ways, peasants cease to be peasants. In England they became an urban proletariat, in Taiwan they have become small capitalist farmers, in Russia they were first eroded by the changes of capitalism, and then collectivised, while in Puerto Rico and in parts of Kenya today, they have become a landless rural proletariat. Whatever the route, the relations of production characteristic of the peasant family farm have been changed, the biological unit we know as "the family" no longer coincides with the economic unit we know as "the farm". Fertility decline is by no means an automatic response to this change — as Marx observed of the 19th-century English urban poor, [6, p.372] and as many have observed of the urban poor in today's underdeveloped countries, [3] it is possible for the relations of intra-family exploitation to continue within another, dominant mode of production. But the general trend is away from this, just as the practice of Kenyan commercial farms "paying" their workers partly in the form of a small plot of land for family cultivation is now dying out [4].

To sum up, we suggest that the peasant "mode of production" produces a societal pressure for high fertility; that this fertility is effectively reduced for the poorer members of any peasant community; and that, when the peasant mode of production changes, average fertility falls.

The implications for Ethiopia are as follows. There are five ways in which the implementation of the 1975 land reform throughout the country, and the proposed transformation of peasants' associations into producers' cooperatives, will have a powerful effect on fertility. These are (1) through the present confirmation of the bulk of the rural population as peasants; (2) through the reduction in inequality of landholding; (3) through the socialisation of production via cooperatives; (4) through the changing position of women; and (5) through the changing economic role of children.

Firstly, this reform has ensured that, for the present time, the great majority of the rural population will be peasants. The two fundamentals of the peasant economy, access to land and reliance on family labour, have been strengthened by the reform. Hiring of labour is forbidden, except in restricted cases. Moreover, the two traditional routes out of the peasantry have been blocked. Formerly marginal peasants, liable to imminent dispossession and consequent proletarianisation, are now secure, and in many cases now have more land than before. The potential small capitalist farmers cannot hire labour or rent extra land. Thus the changes which might have reduced the proportion of the population who are peasants (and thus reduce the proportion who have the highest fertility) will not now occur, at least not in the way which seemed likely before 1974.

Secondly, inequality within the peasantry has been or will be drastically reduced. This removes the cause of different fertility between rich and poor peasants, and there is every reason to suppose that it will be the formerly poorer peasants who will now raise their fertility to the level of the formerly richer, rather than the other way around. With the ban on hiring of labour and the impossibility of acquiring extra income from either renting more land or from renting out one's own land, the primacy of family labour as the major resource for family production is further strengthened. Thus the equlaisation of land-holding, which is the result of the 1975 land reform, will be a strong reason for fertility to raise.

Thirdly, the transformation of the peasants' associations into one form or another of producers' cooperatives will, in time, cause the Ethiopian peasantry to cease to be peasants. The mode of production, now based on family labour for a family income, will change to a form of socialised production, with income paid to individuals according to their work. The relations of production within the family will change, and the high fertility which is a product of the peasant mode of production will lose its rationale. Thus the socialisation of production will cause fertility to fall — indeed, such socialisation will signal the start of the long-term fertility decline in Ethiopia, which will only end when fertility has fallen to levels now found in developed countries.

Fourthly, there is the impact on fertility of the changing status of women. The end of the peasant family mode of production, in which relations of both production and reproduction in a sense coincide, will remove one major structural support of the exploitation of women by men. Whether new structures will emerge is difficult to say, for such exploitation is clearly not the sole preserve of the peasant mode of production. But we would expect the general trend in Ethiopia to be one of the emancipation of rural women, and it seems probable that such emancipation will include the freedom from perpetual child-bearing. One of the unknowns of fertility research is the answer to the question, "If women alone had the choice, would they have as many children as they now have?" Incidental data suggests that they would not, in that abortion (legal or illegal) is increasingly common throughout the world, and is a means of fertility control which is the choice of the woman alone, rather than the choice of man and woman together. Thus, in general, we would expect fertility to fall as a result of the changing structural position of women in the new mode of production, and as a result of their emancipation politically and ideologically, which is a general commitment of the Ethiopian revolution.

Lastly, there is the impact on fertility of the changing economic role of children. The share of total labour inputs on small farms which is provided by children is probably of the order of between 20% and 30%, if the Ethiopian peasantry is anything like that of Kenya, Tanzania or Indonesia

[2, 11, 12]. It should be remembered that children are particularly productive at peak times of agricultural labour, and in those laborious tasks which the statisticians tend to delegate to the category "domestic chores", such as baby-minding, fetching water or fuel, and so on. Now it is possible that the transformation of agriculture, through cooperatives but also through new technologies, might in fact raise the productive role of children; but the basic change away from the family-based mode of production will reduce the benefits to each set of parents of having many children; though, without such transformation, the demand for family labour by peasants in peasants' associations might be expected to increase. Thus we would expect the costs and benefits to peasant parents of having children would be in favour of a larger number so long as the basic 1975 land reform persists, but to change in favour of smaller families once production becomes socialised.

CONCLUSION

The immediate effect of the 1975 land reform, and of the structure of production which has arisen from it, will have a powerful positive effect on the fertility of the rural population. This is because the reform has turned the rural society into a society of relatively equal peasants, and peasants as a whole have high fertility, and their average fertility is only held back by inequality. The socialisation of agricultural production through the creation of cooperatives, or of state farms, etc., will however, remove the basic structural reason for high fertility; and changes in the position of women and of children in the structure of production will further encourage a reduction in fertility.

The effect of such changes in fertility on the rate of population growth, now and in the future, will depend greatly on how fast or slowly the transformation of the peasants' associations into cooperatives proceeds. A fairly short period of very high fertility, say 20 years, will continue to push up the rate of population growth for at least two generations, say for the following 50 years, even if, after this period of high fertility, fertility falls quite rapidly. This is because changes in fertility take a long time to work themselves out in their effects on population growth. The rate of population growth will also, of course, be influenced by other factors, notably the speed with which mortality falls, but also by political agitation of women causing changes in fertility, the spread of access to education causing changes in the economic costs and benefits of children, and so on. But we believe that the fundamental impact on fertility will come from changes in the relations of production in the agricultural sector.

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