BRAIN DRAIN IN PAKISTAN: A SURVEY OF PROBLEMS AND POLICIES

By

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Introduction

The phenomenon of brain drain is attracting worldwide attention as a source of reverse flow of technology from developing to developed countries. Under certain assumptions, it can be shown to exceed the resource flow from the developed nations to the developing world in the form of aid (UNCTAD 1975). This is of obvious concern to the Third World demand for a New International Economic Order wherein resources are shared equitably between countries. From the viewpoint of the individual country, however, the effect of the brain drain on the domestic allocation of resources is a more important and immediate policy concern. Jolly and Seers (1972) were, perhaps, the first to emphasize the connection between the process of development and the brain drain. Hamada and Bhagwati (1975, pp. 265-279) have also attempted to investigate the "malignant" and the "benign" impact of brain drain, focusing on the perverse effects of the phenomenon on domestic wage, salary structures and internal brain drain in developing economies.

This paper attempts to analyze the migration of highly skilled and trained personnel from Pakistan from the standpoint of its impact on the domestic economy and the policies adopted in this regard. This analysis is conducted within the wider perspective of the migration of Pakistani nationals in general.

The paper has four main sections. Section I analyzes the broad trends in the migration pattern of both skilled and unskilled manpower. In Section II the relationship between development strategies (or policies) and migration in general is examined briefly. Section III analyzes critically specific policies that have directly influenced the nature and magnitude of the brain drain problem. Section IV focuses on the problems and policies relating to three specific professional groups: doctors, engineers, scientists and professors.

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Broad Trends in the Migration Pattern

Historically, migration of Pakistani nationals (both skilled and unskilled) abroad may be divided into three major time periods, corresponding roughly to the three decades of its existence: 1947-57, 1958-67 and 1968-77. These three decades were characterized by a distinct set of political and economic conditions within and outside the country, which inevitably interacted with the trends in overseas migration.

A. *The First Decade (1947-57)*

The partition of the Indian subcontinent in 1947 was accompanied by mass migration, on an unprecedented scale, across the borders between Pakistan and India. This led to the severance of the link between areas which came to constitute Pakistan and the traditional trading and manufacturing centers of the subcontinent. The first decade, especially its first half, was a period of readjustment between the resource requirements and resource availabilities of the new nation. Attempts were made from the start to transform the predominantly agricultural nature of the economy. Thus, attention was diverted to the country's industrial base by encouraging import-substituting industries, of which textiles acted as the leading sector. This process was greatly helped by a favorable balance of payments situation, strengthened temporarily by the Korean War boom in primary commodities in the early 1950s.

In the international sphere, Pakistan became increasingly linked to the developed market economy countries. Not having been affected yet by the postwar "baby boom" in their labor force and enjoying an unprecedented period of economic resurgence, these countries began to experience large-scale labor shortages. This created a favorable climate for the migration of unskilled workers from Pakistan in the 1950s, mainly to the United Kingdom, West Germany and other Western European countries. In this period, "brain drain" was not a serious problem for the Pakistan economy which was then characterized by plentiful employment opportunities due to the lack of educated manpower.

B. *The Second Decade (1958-67)*

The second decade of Pakistan's existence was characterized by political stability, accompanied by steady growth, especially in the industrial sector. However, the period was also marked by an increase in economic disparities: inter-regional, rural-urban and inter-

sectoral. The terms of trade, on the whole, worked against the agricultural sector, adversely affecting the income in rural areas and the job opportunities for the agricultural labor force. Although industrialization favored overall growth, it did little to create sufficient employment possibilities for the country's expanding labor force. The pressure on land in the rural sector further aggravated rural poverty and unemployment, leading to a significant increase in rural-urban migration in this period.[1]

Thus, in spite of the worsening climate of immigration in host countries, especially the United Kingdom, emigration of both skilled and unskilled workers increased, particularly from among the educated unemployed whose numbers had substantially increased by the 1960s. The post-partition vacuum in high-level skilled jobs had been largely filled by this time and there was a relative saturation in the job market for highly educated people. These greatly increased the incentives for migration abroad, and lessened the incentives to return home.

C. *The Third Decade (1968-77)*

In the third decade, the migration problem began to have a significant effect on Pakistan's economy. The increased demand for skilled manpower by the Middle Eastern states created a new avenue for the migration of labor force from Pakistan. The first half of this decade was also a period of internal turmoil and unstable economic conditions. It culminated in the war with India and the creation of Bangladesh. In the second half, until early 1977, a climate of political and economic uncertainty prevailed although the government was stable. This led both to a flight of capital and entrepreneurial and managerial talent abroad and to reduced industrial activity at home. The period also witnessed a more active demand for labor in the Middle East, following the oil boom of 1973.

Thus, by the end of the 1970s, approximately 50,000 Pakistanis were estimated to have left the country each year. This constituted about ten per cent of the annual increase in labor force. Of these, 70 per cent were estimated to be unskilled laborers, 15-20 per cent semi-skilled workers (mechanics, welders, carpenters, masons, etc.), and 10-15 per cent highly skilled personnel (doctors, engineers, ac-

[1] For a comprehensive review of rural outmigration during the period, see S.J. Burki, "Rapid Population Growth and Urbanization: The Case of Pakistan", *Pakistan Economic and Social Review,* Vol. XI, No. 3, (September 1973).

countants, teachers, etc.).[2] The Bureau of Emigration and Overseas Employment estimated that in June 1977, there were about 660,000 Pakistanis employed abroad, of which nearly 250,000 (or about 40 per cent) were in the United Kingdom, 55,000 in Saudi Arabia, 45,000 in Qatar and 37,000 each in Abu Dhabi, Dubai and Oman (See Appendix Table 1). Thus, about 3-4 per cent of the Pakistani labor force today is employed overseas, mainly in the United Kingdom and the Middle East. This is, however, only a minimum figure since many of the Pakistanis who migrate have not been registered in government statistics. If this boom continues unabated, it is likely to cause serious imbalance in the manpower situation and create shortages of specific skills, as is already apparent in some cases.

The level of remittances in the past five years has risen seven times, from 500 million rupees to 3,500 million rupees, and now constitutes one of the major sources of foreign exchange receipts.[3]

Although official figures do not give the breakdown of the remittances by country of origin and type of migrants, some unofficial and tentative estimates are available. Up to 1970, the proportion of total remittances that came from emigrants in the United Kingdom was 95 per cent. However, this proportion has fallen steadily, so that in 1975-76 it made up only 15 per cent of the total. This decline is a result of two factors: first, the virtual stoppage of Pakis-

TABLE 1

Remittances from Abroad by Source (Million US dollars)

	1973-74	1974-75	1975-76	1976-77
OPEC countries	43	88	208	294
U.K.	52	71	53	50
Others	55	70	92	101
Total	150	229	353	449*

*In 1978-79, the level of remittances reportedly reached more than $1.5 billion.

Source: State Bank of Pakistan

[2] See Planning Commission, *Working Papers for the Development Perspective (1975-80)*, Vol. I, p. 193.

[3] The estimate for fiscal year 1976-77 is 4,450 million rupees or 36 per cent of total export earnings.

tan emigrants to the United Kingdom, and second, the large increase in remittances from sources other than the United Kingdom.

The limited available data presented in Table 1 shows that the biggest flow of emigrants goes to the OPEC countries. The emigrants who have gone to the Gulf states in the 1970s are different from those who went a decade earlier to the United Kingdom and other Western countries. For the new emigrants, there is usually no hope for permanent settlement in the host country. Since the costs of housing, food and education are very high in these countries, most emigrants do not bring their dependents with them, often working on a contract basis for a specific number of years. Thus, they normally remit a much higher proportion of their incomes than the migrants to other places in earlier years.

Development Strategies and Their Impact on Migration

The level and pattern of migration in general (i.e., of both skilled and unskilled manpower) are also related to the development strategy the country adopts and its success in manuevering the economy into a position wherein it can provide a sufficient level of employment and income to its nationals.

A. *Main Features of Pakistan's Development Strategy*

The strategy adopted by Pakistan during the past two decades does not seem to have succeeded in relieving unemployment and underemployment in the country, especially in the rural areas. Until the end of the 1960s, the development strategy placed singular emphasis on growth, to the detriment of the agricultural sector which typically accounts for much of total employment. The conspicuous failure of this strategy to relieve the problems of both unemployment and underemployment and pass on the benefits of growth to the poor, resulted in the populist revolt against Ayub's government in 1968-69.[4]

More recently, however, the agricultural sector has received somewhat greater attention than the industrial sector. The goal of growth though is still pursued with undiminished zeal, but with reduced success. The main objective of the growth strategy in the agricultural sector has been to achieve self-sufficiency in food production by 1980. In achieving this goal, large and medium-sized farmers have been actively encouraged by the government. They

[4] For a critique of this strategy see Naseem, S.M. "Goodbye to Growth?" in Admad, R., S.M. Naseem and A. Ghouse (eds.), *Economic Reconstruction in Pakistan*, Pakistan Economic Association, (Karachi 1974).

are granted subsidies to buy tractors, tubewells, fertilizers and seeds. They are also given access to concessional credit schemes, and liberalized imports of agricultural equipment and capital goods. The lot of the marginal farmers, tenants and landless workers, on the other hand, does not seem to have improved. In fact, the percentage of people living below the poverty line has increased over time.[5] The population pressure on land and the trend towards self-cultivation by large farmers — partly as a preemptive action against impending land reform legislation — seem to have further aggravated the problem of landlessness and poverty in the rural areas.

With urban industrial employment growing at a slower rate than in the past, the phenomenon of rural-urban migration characteristic of many developing economies, has given way to rural-overseas migration instead. Employment agencies and travel agents go directly to the rural areas in many parts of Pakistan and extort huge sums from poor peasants who sell their land, livestock and other belongings, or borrow money to pay the price of a promise (sometimes false) to be transported to an unknown land and get a lucrative job.

B. *Government Attitude Towards Overall Migration*

The government's attitude towards migration of both skilled and unskilled personnel seems to have been influenced by at least, three major factors. First, it views emigration as one way to ease the country's unemployment and underemployment. Second, emigration is seen as a valuable means of augmenting the scarce foreign exchange resources of the country. As was pointed out earlier, remittances received from workers abroad (to be distinguished from highly skilled or professional personnel) now constitute about 36 per cent of merchandise exports and are as high as those derived from cotton and cotton textiles which traditionally have been Pakistan's chief foreign exchange earners. Third, since much of the new demand for migrant labor originates from the Middle East oil-exporting countries with whom Pakistan wishes to strengthen its economic, political and religious ties, the country has since refrained from imposing any restrictions on the outflow of manpower, especially skilled and semi-skilled manpower. In recent years,

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[5] For empirical evidence on this, see Naseem, S.M. "Rural Poverty and Landlessness in Pakistan: Dimensions and Trends (1960-75)", in *Landlessness and Poverty in Rural Asia*, (ILO 1977).

these countries have also become major suppliers of aid and loans to Pakistan. In addition, Pakistani firms are taking an active part in the development program of these countries, which usually rely on imported manpower from Pakistan especially in the fields of construction, engineering, shipping, and banking.

These considerations have led to a permissive attitude towards overseas migration. The "export" of manpower has, in fact, become a highly profitable business with an assured market and a promise of high quasi-monopoly profits in the short run for private operators. There has been an indiscriminate proliferation of employment agencies, and travel and passport agents, some of whom have been found to indulge in large-scale fraudulent and illegal activities for their short-term gains at the expense of migrants, and the host and home countries. To counteract these, the Government is trying to regulate and restrict the activities of employment agencies. It envisions a complete monopoly of the State-sponsored Overseas Employment Corporation in the hiring of emigrants in the future.

Brain Drain Related Policy Measures

The first two sections has examined the migration problem from a broad perspective. This section attempts to survey those specific policy measures directly bearing on reverse transfer of technology or brain drain, rather than on migration in general. These measures can broadly be considered under five main headings: (A) The context of policy formulation on brain drain; (B) Emigration Ordinance of 1976 to rationalize movement of skilled manpower; (C) Wage and salary structures, including other incentives relating to skilled groups; and (D) Education and manpower policies.

The Context of Policy Formulation

Although the problem of brain drain has existed since Pakistan's inception, public concern about it has increased in recent years as a result of significant losses, both in the quantity and quality of highly skilled persons in almost every professional category. Except in the case of doctors, however, there has been no serious attempt to control the emigration of any group of professionals. In many cases, the government, which is by far the largest employer of such professionals, has allowed its employees to accept overseas jobs, on leave from their parent department for three years or more. However, this privilege is "discretionary" and has depended, not only

on the exigencies of the demand-supply situation in the particular profession, but (as in the case of allotments of industrial and import licenses to individuals for instance) also on the personal influence or preferences of persons with decision making authority.

Very few exercises evaluating the full economic consequences of skilled migration have been attempted for different professions in Pakistan.[6] One study, using rather extreme assumptions, has shown that the ratio of social costs to social benefits in the case of doctor migration comes to as much as 10 (WHO and Irfan-ul-Haque, 1976). While this may not generally be true for other professions, it indicates the dimensions of the brain drain problem.

Emigration Ordinance of 1976 to Rationalize Movement of Skilled Manpower

It is unlikely that government policies have been guided by benefit-cost calculations, although its efforts show concern of the problem. However, even when the government has been inclined to do something about the brain drain problem, it has not always been possible for it to do so; partly because of the all-pervasive pull of the international market for skills; partly because the government has not been clear about its objectives and the means to achieve them; and partly because of the introduction of hurriedly conceived measures with inadequate allowance for 'back up' administrative support. This is well illustrated by the case of a Pakistani legislation, the Emigration Ordinance of 1976, which attempted to rationalize the migration of a large variety of highly skilled personnel and introduce, perhaps for the first time in any developing country, capitation fees of up to 20 per cent on the foreign-earned incomes of migrants. The legislation, introduced in January 1976, was withdrawn within ten days, after strong protests from professional organizations and vested groups at home and abroad.

The ordinance covered 13 broad categories of skilled technical and professional persons: military personnel, civil servants, technologists, scientists, medical personnel, economists, teachers, aircraft pilots, marine pilots, machinists, bankers and accountants. Job

[6] These are, of course, likely to be very sensitive to the assumptions made about the real cost of education and training, the period of stay abroad, migrant's age at departure and return, salary differentials, propensity to remit, etc.

descriptions and qualifications of these categories were provided and persons of each category intending to emigrate were required by the ordinance to obtain a "No Objection Certificate" (NOC) from the Ministries concerned. The capitation fee was required only of "new" migrants in the highly qualified technical and professional categories. Only highly qualified technologists and technicians were charged the capitation fee. Assurances were also given that the provisions of the ordinance would not apply to those who had left the country before the promulgation of the ordinance. Furthermore, the ordinance attempted to streamline the procedures of the recruiting agency system to prevent malpractices of private emigration agents who had become controversial and were sometimes targets of public criticism.

Wages and Salary Structure

One of the major causes of the brain drain is the absolute differential between salaries at home and abroad. The average differential for highly skilled and professional people in Pakistan amounts to 1:10.[7] Very few Pakistanis will decline a foreign employment offer with such high salary differential. If this differential was brought down to almost half or one-third its present level, a sizeable number of emigrants (actual and potential) may well decline the offer, considering that the "initial adjustment cost" of migration tends to be substantial. It is unlikely, however, that in the foreseeable future, international or domestic policies can be designed to reduce the differential to such level.

While it may not be possible to alter substantially the current disparity between domestic and international earnings, it should however be possible to improve the position of skilled personnel relative to others within the country. The welfare of an individual depends not only on the absolute level of his income but also on his relative position in the income distribution scale. A policy ensuring this can assist in arresting the present exodus of highly skilled and professional people from the country.

In fact, the salary scheme in Pakistan, both in the private and public sectors, has been undergoing changes. In the public sector, a number of pay commissions have been appointed from time to time.

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[7] A simple formula equates a person's salary at home in Pakistan rupees to his salary abroad in US dollars, with the exchange rate at ten Pakistan rupees to a US dollar.

The major purpose of these pay commissions has been to recommend across-the-board salary increases to mitigate the effects of the rising cost of living. Some attempts have also been made, however, to rationalize the present wage and salary structures with the view of attracting talents to non-administrative occupations. Specifically, they have taken into account special qualifications and training in fixing the salary levels.

In 1972, the pay structure underwent a major revision and internal reforms in the government and public sector were introduced. Until that time, more than 650 scales of pay, mostly inherited from the days of colonial rule, were operative in the Federal and Provincial Governments. Such high degree of stratification in the public sector did little to encourage talent and was accordingly consolidated into 22 pay scales. These scales, called National Pay Scales (NPS), were in turn grouped into six major categories where vertical mobility was possible.

In addition, an attempt was made in the 1970s to impart some basis of rationality and equity, to the pay and salary structure which has developed in an *ad hoc* manner over the years. The National Pay Commissions of 1970-72 and 1976 attempted for the first time to develop a set of principles for the evolution of the pay structure. The starting point for the 1970-72 National Pay Commission, for instance, was: "to provide adequate financial recompense and due recognition as incentives for persons of the highest calibre to seek employment in the public service." The 1976 National Pay Commission paid more attention to the problem of linking salaries to jobs, rather than upholding the so-called dignity of the employees, although it recognized the inherent difficulties of this principle.

Educational and Manpower Policies

The educational system is the main supplier of highly skilled and professional manpower and, for certain categories, also a principal user. The educational system of a country has far-reaching effects on the demand for and the supply of jobs. In Pakistan, the educational system has developed not so much as a response to the demands for different kinds of skills in the economy, but more as a result of the growth of those sections of population which can afford to educate their children. Consequently, although Pakistan ranks as the lowest among Asian countries in terms of the percentage of national expenditure devoted to education, it ranks as the highest in terms of the percentage of educational expenditure devoted to

higher education (see Appendix Table 2). The educational system has therefore expanded both in size and composition in response to the private demand for education, rather than to the needs of the economy or the social demand for education.

In spite of considerable expansion in the country's educational system since independence, access to education is still limited to a narrow segment of the population, consisting predominantly of the urban, upper income groups. The system is so organized such that it effectively prevents the poor and rural segments of the population from receiving the benefits of education, especially those of higher education.

The expansion of primary education has lagged behind that of secondary and university education. From 1966 to 1976, the enrollments at the primary level expanded at an average annual rate of 4.8 per cent; the secondary level at 6.3 per cent; and the university level at 5.1 per cent. Only about 31 per cent of the children in the 5-14 age group are currently receiving primary school education (for girls it is only 16 per cent). Less than 40 per cent of those enrolled in the first grade finish primary school, and only 15 per cent finish the tenth grade. A study of students at the University of Karachi shows that a child of a parent with a university education has a 4,000 per cent greater chance of going to a university than the child of an illiterate parent (Ruffi, Kilitgaard and Gustafson, 1977).

These facts indicate both the low opportunity and the low demand for education among the poor and rural sections of the population. Many other factors have also contributed to a low effective demand for education among these sections. Rural income distribution is highly skewed and the opportunity cost of sending children to school even when schooling is "free" tends to be very high, especially in peak periods of activity. There are wide disparities between the quality of education and educational facilities available to the children of rural and underprivileged urban population, and those available to children of the urban elites (Planning Commission 1976 and Bureau of Education Planning). The educational prerequisites for entry into urban jobs continue to rise steadily to a level beyond the capacity of rural schools to supply or the parents' ability to buy. Education therefore becomes a poor means of obtaining employment or increasing income.

Lack of a sufficiently strong effective (market) demand for primary education has resulted in lower priority being assigned to that

level of education, although most studies have shown that social rate of return on the primary education sector is generally high. In contrast, there has been a relative overexpansion of post-primary education demanded mainly by the middle and higher income groups whose children can afford to enter the labor market at older ages. This explains why the demand for this kind of education continues to increase in spite of the high rates of unemployment among the educated.[8]

Although reliable estimates of unemployment rate among the educated are not available, a rough approximation would place it between 15-25 per cent. However, it is the technical manpower — usually diploma engineers and technicians — which has very high unemployment rates. The estimates range from 25 to 45 per cent for different categories and have generally increased over time. The period of unemployment among the educated is fairly long. A national survey of middle level technicians who had been out of school for 5 to 10 years showed that 24.4 per cent were unemployed in 1970. Another study of graduates of Lahore Polytechnic revealed that 14 per cent of the graduates had been unemployed for more than a year. A 1972 study of the North West Frontier Province (NWFP) showed that 1 to 2 years after graduation, 64 per cent of the matriculate graduates and 50 per cent of the intermediate graduates did not have jobs nor continued schooling. A survey of Punjab University graduates who had finished 3 to 4 years earlier showed that 47 per cent were unemployed. Another study found that 16 per cent of the graduates of the Agricultural University of Lyallpur were unemployed for nearly 6 to 8 years after leaving the university. A more telling evidence of lack of manpower planning is that only 66 per cent of those who were working had jobs connected with their specialized disciplines.[9]

At the heart of the problem of educated unemployment is the lack of integration between educational and manpower planning. The link between technical education and industry is very weak, resulting in the production of graduates improperly trained for available jobs and their employment in jobs which make little use of their acquired education. The efforts to create both short- and long-

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[8] M. Blaug, in *The Cases of Graduate Unemployment in India*(Lane 1969), analyzes this phenomenon in the context of India.

[9] For specific references see: Saudagar, "Problems of Educated Unemployed", *Pakistan Labor Journal,* (February 1975); and Hoda S.S., "Employment of the Educated in Pakistan", *Manpower Review,* Vol. 1, No. 2. (July-September 1975).

term manpower planning and to devise an effective mechanism for a useful dialogue between educators and employers have so far been inadequate. While some mismatch between educational output and employment opportunities is inevitable in a changing and uncertain world, constant attempts nevertheless are needed to minimize this gap.

The higher education sector absorbs a disproportionately high percentage of investment in education (about 40 per cent of capital expenditure). Yet, its contribution to national development has been dubious. Planners and policy makers are evidently conscious of this problem. They are attempting to curtail enrollments and expenditures and improve the quality and content of instruction.[10] However, the political pressures to maintain the status quo are so great such that a significant change may not be possible.

This brief survey of the government's educational policies shows that there is a considerable misallocation of resources in the education sector, i.e., under-investment in primary education programs which could serve the poor better, and over-investment in higher and professional education. Emigration of semi-skilled, skilled, highly skilled, and professional manpower can be viewed as one way of solving this lack of correspondence between educational supply and domestic demand for jobs. Deliberate creation of surpluses through overexpansion of capacity seems to be an unwise policy in the short and long run, since higher and professional education in Pakistan is expensive and heavily subsidized. Table 2 illustrates the different costs borne by the government and by the students for different levels of education in the country.

Two main inferences may be drawn from the table regarding the cost to society of the migration of its highly skilled manpower: (a) that the cost of migration rises sharply as the level of education at which migration occurs increases; and (b) that a very substantial burden of this cost falls on the society directly, since a fairly high proportion of educational costs, particularly at higher education levels, is borne by the government using public funds (tax revenues).

Problems and Policies Relating to Three Specific Professional Groups: Doctors, Engineers, Scientists and Teachers

This section discusses the special problems and policies related to three categories of professionals — doctors, engineers and scien-

[10] See, for instance, Planning Commission, *Working Papers for the Development Perspective,* Vol. II, Government of Pakistan, Islamabad.

TABLE 2

Cost of Education According to Level (in Rupees)

Education Level	Gov't-borne Recurring Costs	Pupil-born Recurring Costs	Foregone Earnings	Social Recurring Costs
Primary (1-5)	1050	150	2280	3480
Middle (6-8)	945	120	3192	4257
High (9-10)	1566	96	2288	4550
Inter (11-12)	4810	740	3496	9046
Upper (13-14)	5604	788	4104	10,496
Univ (15-16)	17,636	818	4864	23,318
Eng. College (13-16)	35,272	1636	9728	46,636
Medical (13-17)	44,090	2045	12,160	58,295

Source: Bureau of Educational Planning, Ministry of Education, *Pakistan Education 1974: A Sector Assessment* (Islamabad, October, 1974).

tists and university teachers — who constitute the bulk of those involved in the brain drain problem. There are other professional categories, such as aircraft pilots and crews, accountants and managers, etc., which are also important but which have not been included in the present discussion for lack of sufficient information.

A. *Doctors*

Traditionally, the phenomenon of the brain drain has been associated with the emigration of doctors. The number of qualified doctors produced in the country each year is estimated to be 1,000. Reliable figures on emigration of doctors have not been available since 1973-74. The Ministry of Health, however, issues data about doctors who are granted "No Objection Certificates" (NOCs)[11] each year. These are given in Appendix Table 3. Figures in the table indicate only the number of those "permitted" to leave rather than those who actually left the country over the period 1973-77. Those who actually left are generally greater in number in spite of the

[11] NOCs amount to the permission to leave.

possibility that all who received the permission may not have availed of it, since a considerable number of doctors emigrate through various illegal channels (e.g. by obtaining passports as students or by not disclosing their correct profession or even through tacit payments to immigration officials) without obtaining the NOCs. It is estimated that each year, about 50 to 70 per cent of the annual output of doctors, (i.e. 500-700) leave the country (either illegally or through formal channels) for employment abroad.

Policies Regulating the Outflow of Doctors. The regulations governing the exit of doctors have undergone changes from time to time. In the first two decades of Pakistan's existence there was virtually no restriction on leaving the country. The only requirement was a valid passport. Restrictions on the grant of foreign exchange were readily waived for approved courses of education. From 1961 to 1970 about 250 doctors left the country annually, or a total of 2,537 doctors over the ten-year period (see Appendix Table 4). Of these, about 100 left each year primarily for higher studies in medicine.

Since 1971 the annual outflow of doctors has increased considerably and the government has been forced to issue a number of restrictions on their exit from the country. The first set of restrictions came in September 1973 when a total ban on the exit of doctors was implemented to "regulate the brain drain of qualified medical doctors from Pakistan". The doctors exempted from this ban were required to obtain the NOCs from the Ministry of Health. The exemptions were granted only if the recruitment for employment abroad was done on government-to-government basis and if a request was made by a foreign government through official channels. Exemptions were also given to doctors going on fellowships, scholarships or training abroad with government approval.

In the case of training at the trainees' private expense, NOCs were given only in the fields of study for which training facilities did not exist in the country. Postgraduate training leading to Fellowship of the College of Physicians and Surgeons (FCPS) was started in two postgraduate medical centers at Karachi and Lahore mainly to replace equivalent medical training which Pakistani doctors had traditionally obtained in the past from the United Kingdom and the United States. However, training and research facilities at these centers are inadequate and a strong preference among Pakistani doctors with foreign postgraduate degrees still continues.

The emigration of doctors has been viewed with considerable concern in government circles, especially since nearly half the stock of Pakistani doctors is believed to be serving abroad (Planning Commission, Government of Pakistan and Ahmed 1976). The number of doctors being produced per year, which stood at 1,000 for the last ten years or so is expected to rise to 4,000 in the next three years as a result of the expansion of medical education during the past five years. However, the entire stock of doctors (minus those who emigrate) seems to be concentrated in urban centers with only marginal movement to the rural areas. In the absence of such a movement, the pressures to "emigrate" and further liberalize the restrictions on doctors' emigration have tended to increase.

Attempts to Encourage Emigration of Doctors to Rural Areas. The almost total absence of doctors in the rural areas and their large-scale emigration abroad clearly highlight the urban bias of Pakistan's development strategy. These also reveal the intimate connection between the rural-urban migration within the country and "outmigration" from the country. The few in the rural areas who manage to get higher and professional education tend not to return to the rural areas. They either permanently settle in the urban areas or emigrate abroad.

The government has taken certain measures to encourage migrant doctors to return home and motivate them to settle in the rural areas. Permission is granted to returning doctors to import equipment without customs and other import duties. Private practitioners, particularly specialists, who want to settle in the rural areas are provided land for free by the government. Loan facilities are also provided to practitioners for establishing clinics and hospitals in the rural areas.

The Cost of Educating a Doctor. The cost of educating a doctor in Pakistan has been estimated at about Rs. 80,000 (see Table 2). Since a large proportion of those trained as doctors emigrate, this expenditure contributes very little to the welfare of the country. As it is likely that a large part of the increased output of doctors in the coming years will be exported without a corresponding return to the producing country, there seems to be a strong case for making the medical profession pay at least for the cost of education. One suggestion was to introduce a compulsory internship scheme for every medical graduate before he is registered as a doctor (Ahmed 1976). Since an intern is normally paid half the salary of a new doctor this would be a way of retrieving the amount invested in training a doctor. Furthermore, since many of the intern-

ships are in the small urban centers and subdistricts, the scheme could also increase the chances of the rural population's access to medical facilities.

B. *Engineers and Technologists*

The stock of qualified engineers in Pakistan is estimated at about 15,000. The present number of engineers produced by engineering colleges is 1,600 per year. By the end of this decade, the output is likely to go up to 2,000 per year.

The considerable unemployment in the engineering profession in the past, has somewhat improved in the last five years due to two major factors: (a) growth of employment in public projects, like the Tarbela dam, and other heavy engineering and steel projects; and (b) immigration mainly to the Middle East. Nevertheless, the reported unemployment rate among engineers is still about 10 per cent.

Significant emigration of engineers is of recent origin. Information from the Bureau of Emigration indicates that whereas 427 engineers emigrated during the decade 1961-71, emigration during the next five-year period (1971-75) amounted to 800 (see Appendix Table 4). The number of engineers who migrated through government channels also increased substantially, from 26 in 1971 to 419 in 1976. Furthermore, an equally large number of engineers probably left the country without being registered with the Emigration Bureau.

There are no restrictions on the emigration of engineers and the government's policy seems to encourage their emigration, partly to relieve unemployment. However, much of the unemployment problem is structural and not curable by emigration *per se.* The government faces some difficulties regarding the engineering profession. The present overexpansion of engineering colleges, especially in civil engineering, may become a burden after the employment boom in the Middle East slows down and emigrants start returning home. From the long-run point of view it may be more profitable to concentrate expansion in fields more closely related to domestic demand.

C. *Teachers and Scientists*

It is difficult to estimate the number of highly qualified scien-

tists and teachers in the country. The number of teachers in higher education (presumably including those with postgraduate degrees) has been estimated at 15,000 (see Appendix Table 4). An equal number of postgraduate degree holders are probably employed in research institutions, government departments and private establishments. A considerable proportion of these highly qualified scientists and teachers have had foreign training and research experience.

The number of university and college teachers who have migrated is almost equal to that of doctors. The universities have been the worst sufferers. In one university, 125 teachers out of a total teaching staff of 375 had left for foreign countries. Some professions have been more seriously affected. A 1975 inventory of 350 Pakistani economists, with at least some foreign training, showed that over 100 were working outside the country.

Causes of Brain Drain Among Scientists and Teachers and Attempts to Solve the Problem. Although monetary considerations was the primary reason for emigration, there have been other factors which influenced the decision to emigrate among scientists and teachers. These are the lack of proper research facilities, harassment and irritation caused by bureaucratic delays and red-tape, the low social esteem given to teachers, and factional campus politics which account for the low regard for academic excellence and commitment.

The hope of finding a better professional climate abroad is a great pull factor for the scholar. The possibility and sometimes the need for international contacts and collaboration with other research workers who can provide him the desired intellectual stimulation and exchange of ideas is a factor reckoned with seriously by Pakistani scientists and scholars of international standing. It is, however, true that most of the recent migrations have been to Africa and the Middle East where, with few exceptions, the academic environment is hardly any better and the level of teaching standard sometimes lower. Nevertheless, the scholar is liberated from financial worries and other similar problems. His job allows him to concentrate on his academic and research goals and provides him the satisfaction he can not find at home. Of course, the temptation to relax in a comfortable and non-competitive atmosphere is also present and its danger may not be minimized. But since the international job market is usually very competitive, a person is unlikely to survive if he gives in to this temptation.

The policies adopted to solve the problem of brain drain of scientists and university teachers have usually been inadequate. As pointed out in Section C, the pay and salary structure of public employees, regardless of their professions, have been made uniform on the basis of their qualifications and abilities. This has put scientists and educators on an equal footing with other professionals employed in the public sector with regard to salaries. However, they still compare unfavorably with respect to fringe benefits, such as housing, medical facilities, transportation, secretarial services, etc. The government has done little to provide serious and committed scholars and scientists with a social and professional climate which would enable them to pursue their research activities. Merit and scholarships have not been considered in making appointments and promotions which have become political issues. Facilities for independent research and professional practice are inadequate. Restrictions and bureaucratic controls on visits abroad to attend seminars, and on short-term visits of professors on sabbatical leave have effectively encouraged them to emigrate on a permanent basis.

Some Well-Meaning Efforts that Failed. In spite of the general lack of policies to check the brain drain of scientists and scholars, the government undertook some well-meaning efforts. In 1967, the government decided to establish a Federal University in Islamabad, which would concentrate exclusively on postgraduate studies and research. The university was principally envisioned to reverse the "brain drain" by attracting expatriate Pakistani scholars to accept faculty positions in the new university and form its nucleus staff. Repatriation grants for staff members and their families were provided. Staff salary scales were the same as in other universities but teaching ranks and initial salaries were determined on the basis of the teacher's qualifications and publication record rather than on experience or age. The teaching load was kept deliberately low — an average of four hours per week — to encourage research. Sabbatical leave was granted every three years and liberal facilities were provided to the academic staff to attend national and international symposia and seminars in their fields.

Although the university still exists (renamed after the founder of the country), the idea behind its existence is all but dead a few years after its inception. Political interference, mediocre leadership and professional jealousies reduced the university to a stage wherein the nucleus staff, as well as those they had managed to attract, felt themselves completely isolated in their efforts to maintain the old

standards of teaching and research. Sabbatical leave privileges have been reduced to only once after six years completion of service. In appointments and promotions, experience tends to be given greater weight than performance or publications.

In recent years, the University Grants Commission and the National Science Foundation have made positive, though still inadequate, efforts to redeem the profession of scientists and university teachers. By promoting a number of research programs and projects, by organizing seminars and conferences and by promoting exchanges among scientists and teachers who come from different institutions, it has performed an extremely useful function. Handicapped by insufficient resources, however, it has failed to create the necessary infrastructure needed to prevent or reverse the brain drain.

It is, of course, impossible to find a completely satisfactory solution to the "brain drain" problem as long as the problem of underdevelopment itself is not solved. Appeals to patriotism and the need for self-reliance, which the Chinese have successfully used, are bound to be ineffective in an environment where they are addressed only to limited sections of the population and are not accompanied by complementary policies.

APPENDIX TABLE 1

Number (Stock) of Pakistanis Overseas as Estimated by Pakistan Missions Abroad as of 1977

	Country of Immigration	Estimated Number of Migrants
A.	Developed Market Economy Countries	356,690
	United Kingdom	250,000
	Canada	50,000
	United States	30,000
	Denmark	6,000
	Greece	5,000
	Germany(West)	4,000
	Norway	4,000
	Sweden	3,000
	Portugal	2,007
	Netherlands	1,000
	Others	1,683
B.	Socialist Countries of Eastern Europe	294
C.	Developing Countries	295,317
	Saudi Arabia	55,000
	Qatar	45,000
	Abu Dhabi	37,000
	Dubai	37,000
	Oman	36,000
	Kuwait	25,000
	Bahrain	12,000
	Libya	8,000
	Iran	5,700
	Iraq	5,500
	Other Middle Eastern Countries (states)	8,548
	Other Countries	30,652
	Total	662,381

Source: Bureau of Emigration and Overseas Employment, Government of Pakistan.

APPENDIX TABLE 2

Education Expenditures as Percentage of GNP for Selected Countries

Country	Per Capita Income in US$	Total	Primary	Secondary	Higher
	(1)	(2)	(3)	(4)	(5)
			(Per Cent)		
Malaysia	570	4.99	2.34	1.82	.82
Philippines	280	4.93	2.73	.94	1.26
Sri Lanka	120	4.90	1.73	2.89	.27
Korea	—	3.37	1.57	1.21	.57
Burma	80	3.11	1.09	1.34	.67
Thailand	270	2.97	1.75	.71	.50
Singapore	1,830	2.42	1.07	.83	.51
Indonesia	130	2.17	1.54	.43	.19
Pakistan	120	1.69	.61	.51	.57
Nepal	90	.73	.21	.20	.30
Typical Asian country	—	3.04	1.33	.93	.56
Developing countries	—	4.40	1.68	1.79	.71
OECD countries	—	3.47	1.67	1.05	.58

Source: Per capita income taken from *World Tables, 1976,* The World Bank, Washington, D.C.

Percentage expenditure figures for all countries except Pakistan taken from Zymelman, M. "Patterns of Educational Expenditures", *World Bank Staff Working Paper* No. 246 (November 1976).

Percentage expenditure figures for Pakistan calculated from figures used by the Planning Commission for 1975.

APPENDIX TABLE 3

Total Number of NCOs Issued to Doctors

Destination \ Year	1973/74	1974/75	1975/76	1976/77	Total
			(Number)		
United States	66	94	85	55	300
United Kingdom	159	149	144	126	578
Iran	267	104	196	255	822
Libya	193	21	97	45	356
Saudi Arabia	191	177	134	198	700
Other Countries	(221)	(259)	(297)	(513)	(1,290)
Total	1,097	804	953	1,192	4,046

Source: Ministry of Health

Note: Figures in parentheses are estimates.

APPENDIX TABLE 4

Number of Pakistanis Selected for Overseas Employment During 1971 to 1975, By Occupation

S. No.	Occupation	1971	1972	1973	1974	1975	Total
		(1)	(2)	(3)	(4)	(5)	(6)
				(Number)			
1.	Engineers (427)[a/]	26	113	155	205	302	801
2.	Doctors (2537)[a/]	38	606	222	286	118	1270
3.	Nurses	47	403	46	58	62	516
4.	Teachers	68	45	415	349	446	1323
5.	Accountants	30	14	98	97	73	312
6.	Managers	1	4	—	17	46	68
7.	Welders	18	—	—	442	663	1123
8.	Stenographers	11	31	26	94	74	236
9.	Storekeepers	41	34	44	83	130	332
10.	Clerks/typists	43	110	133	327	571	1184
11.	Agriculturists	—	—	45	16	1	62
12.	Foremen/supervisors (factories/firms)	58	57	52	—	180	355
13.	Masons	773	649	912	1166	1789	5109
14.	Carpenters	—	514	597	924	2642	4677
15.	Electricians	436	315	338	252	723	2064
16.	Cooks	557	295	90	159	314	1415
17.	Plumbers	252	201	53	162	426	1094
18.	Waiters/bearers	416	375	—	116	146	1053
19.	Steel erectors	397	—	—	—	452	849
20.	Painters	243	318	26	87	133	807
21.	Laborers	—	290	616	3126	5934	9966
22.	Technicians (all types)	72	32	2037	524	319	2984
23.	Mechanics	—	—	129	455	1221	1805
24.	Cable jointers	—	280	311	—	24	615
25.	Other categories	7	24	5955	7383	6280	19649
	Total:	3534	4530	12300	16328	23077	59769

Source: Bureau of Emigration and Overseas Employment

[a/] 1961 – 1970

APPENDIX TABLE 5

Pakistanis Working Abroad By Occupation and Country as of 31 December 1966

Countries	Doctor	Engineer	Teacher	Accountant	Statistician	Managerial	M.Sc.	Ph.D.	Others	Total
Canada	29	12	25	7	—	—	8	—	—	81
W. Germany	4	1	1	—	—	—	—	1	—	7
Iran	—	3	—	13	1	3	—	—	1[a/]	21
Lebanon	—	—	—	—	—	—	—	—	—	—
Libya	173	100	—	—	—	—	—	3	—	276
Japan	—	—	—	—	—	—	—	—	—	—
Kuwait	7	2	6	—	—	—	—	—	—	15
Tanzania	5	—	10	3	—	—	—	—	—	18
Saudi Arabia	1,068	26	1	—	—	—	—	—	4,905	6,000
United Kingdom[b/]	—	—	—	—	—	—	—	—	—	—
Abu Dhabi	—	1	—	—	—	—	1	—	—	2
Nigeria	30	40	35	5	—	—	—	—	—	110
USA[c/]	30	5	—	—	—	—	5	—	14	54
Turkey	—	—	1	—	—	—	—	—	—	1
Total:	1,436	190	79	28	1	3	14	4	4,920	6,585
										1,100[b/]
						Total:				7,685
										1,000[c/]
						Grand Total:				8,685

Source: Compiled by National Employment Bureau

a/ Refers to pilot.

b/ For the U.K. an estimated 1,100 doctors must be added.

c/ For the USA an additional 1,000 persons must be added.

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