

CHAPTER- III

BRAIN-DRAIN - CONCEPT, EXTENT, CAUSES AND IMPLICATIONS

Grubel and Scott defined it as " The migration of highly skilled individuals to the U.S." <sup>1</sup> and then they analysed the effects of such immigration on the U.S. Economy. The UNCTAD study described it as a reverse transfer of technology and it accepted the definition of skilled immigrants as covering PTK i.e. professional, technical and kindered workers. This was derived from the classification of workers adopted by the United States Immigration and Nationalisation services. <sup>2</sup> While commenting on the use of the world brain-drain, G. Chandra stated "one wonders about the meaning of the term" drain is used to transport the used-up and unwanted material from one place to another. Is this what one means by brain-drain ? certainly not. Brain-drain connotes the flow of highly educated and trained people from less developed countries to more developed ones, where the opportunities are better. It is a flow of human capital from less rewarding areas to more rewarding areas of the world." <sup>3</sup>

There are four catagories or types of brain-migration which are discussed at length by Dr. B.N. Ghosh and Dr. Mrs. Roma Ghosh. <sup>4</sup>

In their opinion, due to the overproduction or under utilisation of brains, some of them remain wholly unabsorbed or surplus. This they call 'brain-overflow' George Baldwin has also explained the problem by accepting this concept of brain-overflow.

The other category that they have pointed out is that of brain-export. In this, the brains are treated just as any other internationally trade commodity for which compensatory payments are made in the form of (mainly) remittances. There are some countries like Barbados and Phillipines, which train the people in such a way that they are easily absorbed in the developed countries.<sup>5</sup>

The third category of brain-migration is that of brain-exchange. In the recent years the less developed countries and the developed areas indulge into an exchange of scholars and scientists for their mutual benefit. However, such exchange is usually for a fixed period and there are no direct losses or gains for any of them.

The fourth category is that of brain-drain proper, which involves a one-way permanent migration of skilled people mostly from less developed countries to the developed ones.

The internationalists always used brain-drain to mean brain-overflow, and hence have pointed out the advantages stemming from it to the less developed countries.

It has to be admitted, however that, it is very difficult to distinguish clearly between the brain-overflow and brain-drain.

Brain-overflow mainly implies migration of labour from the category of surplus labour. The persons thus migrating are

unemployed in the home country. As such, the marginal productivity of the brain is zero in the home country and hence it will not involve any loss to the country of emigration. Emigration of such brains mainly occurs for securing the opportunity of employment in the country of immigration.

Brain-drain, on the other hand is from among those who are already employed in the home country; but these brains are underemployed. The emigration of such brains certainly involves loss in the form of their output for their home country. The main pull factor for such emigration is usually higher income in the country of immigration.

On this background discussion of brain overflow and brain-drain, if we take into account the following facts about the brain-migration from a country like India it will be clear how difficult it is to define the brain-drain proper.

In a country like India, there is widespread unemployment and underemployment but at the same time there is a shortage of technically skilled persons and hence it is not difficult for such persons to obtain remunerative jobs. In such conditions, the urge for higher income, better standard of living, better working conditions, job-satisfaction and better research facilities are the motivating factors which make the brains migrate as soon as the opportunity is available. However, it is very difficult to say whether the emigrating brains are motivated simply by

employment opportunities or not.

Thus the nature of brain-migration from a country like India is actually a mixture of brain-overflow and brain-drain.

For the purpose of our study, therefore we treat all brain migration as brain-drain as it is a more convincing concept, considering the facts mentioned above.

The definition, therefore, that we follow is " brain-drain means emigration of highly skilled manpower from developing countries to the developed ones"

### 3.3 EXTENT OF BRAIN\_DRAIN :-

The estimates of the brain-drain from developing countries to the developed ones are attempted by various organisations study groups, committees as well as individuals studying the problem. Before we make an attempt to estimate the extent of brain-drain from India, we present below the estimates made by others. This is done with a view to providing a reasonably significant basis for our estimates, at the same time it is an attempt to bring together as much available data as possible relating to brain-drain.

Brinlay Thomas,<sup>6</sup> has given the data pertaining to brain-drain from all countries to the United States during 1962-1964.

The same are given in table 3.1.

Table No. 3.1

Scientists and Engineers Admitted to the United States as  
Immigrants by Country of Region of Birth ( 1962-1964).

Year	1962		1963		1964	
Country OR Region of birth	Number	Distri- bution %	Number	Dist. %	Number	Dist. %
Europe	2431	56.6	3002	50.6	2982	21.8
UK	925	21.5	1153	19.4	1175	20.4
Germany	356	8.3	428	7.2	491	8.5
Canada	526	12.2	633	10.7	685	11.9
Mexico	58	1.4	61	1.0	55	0.9
Cuba	289	6.7	198	3.3	236	4.1
South Am.	219	5.1	327	5.5	426	7.4
Asia	498	11.6	1406	23.7	1053	18.3
All others	276	6.4	306	5.2	325	5.6
<b>All Countries</b>	<b>4297</b>	<b>100.0</b>	<b>5933</b>	<b>100.0</b>	<b>5762</b>	<b>100.0</b>

The above table provides evidence of brain drain from developing countries to the United States. Following inferences can be drawn from the above table :

- a) Compared with the European and other countries, brain-drain from developing countries increased sharply from about 12% to 24% ( of the total) between 1962-1963.
- b) The number of immigrants to the United States from Asia, in absolute terms, increased three fold between 1962-1963.
- c) The increase in the number of immigrants from Asia was mainly on account of special congressional legislation passed in october, 1962 allowing large number of young scientists and engineers to achieve immigrant status with a relatively short period of time.
- d) The figures for 1964 indicate that under developed regions ( Asia, South <sup>A</sup>merica, Cuba, Maxico, and othercountries) contributed over a third of the immigrant scientists and engineers.

The United States Congress Committee<sup>7</sup> on Government operation in its report on " Scientific Brain-Drain from the Developing countries" published in 1968 has given the following estimation of immigration of highly qualified manpower (HQM) to the United Stats between 1962-1967.

Table 3.2

Immigration of HQM to USA from Developed and Developing countries  
( 1962-1967 )

Year	From Developed countries		From Developing Countries		From All Countries	
	No.	%	No	%	No	%
1962	3573	60.0	2383	40.0	5956	100
1963	4534	57.4	3362	42.6	7896	100
1964	4607	59.0	3203	41.0	7810	100
1965	4548	63.2	2650	36.8	7198	100
1966	5144	54.0	4390	46.0	9534	100
1967	7359	48.2	7913	51.8	15272	100

Source : Dr. B.N. Ghosh and Dr. Roma Ghosh " Economics of Brain-Migration" Deep and Deep publication, New Delhi, 1982, P. 72.

The data given in the above table indicate that in the years since 1965, the share of developing countries in the total immigrant population of United States has been increasing. It has gone up from 36.8% in 1965 to 51.8% in 1967.

Table No. 3.3 summarises the data relating to immigration of HQM and Lower Qualified manpower (LQM) into U.S.A.) during the period 1950 to 1967. It can be seen from the table that the



proportion of HQM emigrants to LQM emigrants from Asia is highest as compared to the same from Africa and Latin America. It is as high as 2.76:1 for Asia while it is 1.71:1 for Africa and 0.61:1 for Latin America. The conclusion from this table is obvious that Asia is the largest supplier of high quality manpower to the United States for the last several years.

Table No. 3.3  
Immigrants to USA ( 1950-1967)

Year from	Africa		Asia		Latin America	
	HQM	LQM	HQM	LQM	HQM	LQM
1950	60	60	300	400	1300	2400
1951	40	80	300	300	1100	2400
1952	70	110	300	200	1500	3000
1953	70	100	300	400	2200	5000
1954	100	100	600	300	2600	7100
1955	110	200	700	300	2500	8500
1956	100	200	1400	700	3300	9900
1957	200	200	2300	1000	3500	6900
1958	300	200	2200	400	3900	5400
1959	400	200	2300	900	3300	4400
1960	400	200	1900	1400	4000	6600
1961	300	100	1700	1000	4900	7200
1962	300	100	2000	1100	6500	8800
1963	400	200	3800	1000	6700	10200
1964	400	200	2800	700	8000	10100
1965	500	300	2100	800	8300	11200
1966	600	200	5900	2500	7400	10500
1967	900	300	13800	3000	9000	11800
<b>Total</b>	<b>5250</b>	<b>3050</b>	<b>44300</b>	<b>16400</b>	<b>80000</b>	<b>131000</b>

Source : Same as for table 3.2, P. 77.

The occupationwise structure of brain migrations from all developing countries during 1962-1967 to the United States has been presented in the following table 3.4

Table No. 3.4

Structure of Brain-Migration from Developing countries (1962-1967).

Influx/ outflux Countries	Engineers	Scientific Workers		Doctors	Other skilled	Total
		Natural Science	Hum			
To USA	10787	3978	811	7475	63650	86701
<u>From</u>						
Asia	5856	2211	337	2273	17104	37781
India	2141	641	78	174	6112	9129
Iran	369	85	18	311	1616	2399
Pakistan	110	45	4	33	552	753
Phillippines	434	187	36	1158	6214	8029
% of Indian Countries	19.85	15.69	9.62	2.33	9.60	10.53

Source : Same as for table 3.2 P. 76.

It is to be noticed from the data given in the above table that, India has been the largest supplier to the U.S.A. The percentage of Indian contributions to the various categories of occupations mentioned in the table clearly indicate that as many as one fifth of the engineers and one sixth of the national scientists immigrating in USA have migrated from India only.

The percentage of all categories taken together comes to be 10.53% which is quite significant.

The estimates relating to the emigration of skilled persons from Asian countries to the United States are presented in table No. 3.5 below. :

Table No. 3.5

Brain Migration from Asia to USA. ( 1962-1967).

From	Total emigrants	Percentage Distribution in Asia.
a) Asia	37781	-
b) India	9129	24.16
c) Iran	2399	6.35
d) Pakistan	753	1.99
e) Phillipines	8029	21.25

Source : Same as for Table 3.2

The data in the above table show the percentage distributions and the total emigrants from Asian countries to the United States. It is evident from it that India's share in the total emigrants from Asia is the highest, almost one fourth of the total.

The data presented below in table No. 3.6 are relating to the immigrants of USA from Asia.

Table No. 3.6Immigrants to USA from Asia.

Period.	Total No.	Annual Average.	% increase over the earlier period.
I 1956 to 1961	11800	1967	-
II 1962 to 1967	30000	5000	254.19

Source : Same as for Table 3.2

It can be seen from the above data that during the two spans of the period i.e. 1956 to 1961 and 1962 to 1967, the annual average outflow of emigrants from Asia to the United States has increased from 1967 to 5000 and this rise is of 254.19% or a little over two and a half times over the earlier period.

The report of the UNCTAD study gives the following data relating to the share of developing countries in total skilled immigration to the USA, Canada and UK. (Table 3.7)

Table No. 3.7

Share of Developing countries in total skilled immigration to the USA, Canada and UK. ( 1961-1976).

Country of and Occupations	Skilled Migrants from		as % of
	Developing Countries	All Countries	
<u>USA</u>	118816	190813	62
a) Physician and Surgeons	40876	56447	72
b) Engineering and Scientists	77279	133478	58
c) All Others	661	888	74
<u>CANADA</u>	81613	297211	27
a) Physicians and Surgeons	4850	13023	37
b) Engineering and Scientists	13610	42711	32
c) Others	63152	241477	26
<u>United Kingdom</u>	84040	380751	22
a) Physicians and Surgeons	15655	32065	49
b) Engineering and Scientists	9225	54705	17
c) All others	59160	293981	20
<u>Total</u>	284469	868775	33
a) Physicians and Surgens	61381	10536	60
b) Engineering and Scientists	100105	230894	43
c) All others	122983	536346	23

It is particularly to be noted from the above that, in respect of the United States as many as 62 percent of the total immigrants are from the developing countries; and as such it is the biggest buyer importer of the HQM from the developing countries of the world.

3.3.1 ESTIMATION AND PROJECTION OF THE EXTENT OF BRAIN-DRAIN FROM INDIA TO USA :-

It is thus clear from the foregoing, that among all developing countries from Asia, India happens to be the largest supplier of HQM to the developed countries and that, the United State of Amrica is the largest absorbent of the Indian brains.

We, therefore, take into account only the Indian emigration to the USA, for the purpose of our analysis.

It is evident from table No. 3.4 above that during 1962-1967, India's share in the total emmigrations of HQM to USA was 10.53%. We take this as a constant proportion throughout the period for which we attempt estimates of the brain drain from India to the USA.

The latest available data relating to the Brain-Drain from all less developed countries to USA are for the period 1963 to 1973 we present the same in the following table (Table 3.8)

Table No. 3.8

Brain-Drain from all less developed countries to  
U.S.A. ( 1963 -1973.)

<u>Year</u>	<u>No of Persons</u>
1963	11029
1964	11418
1965	11001
1966	13986
1967	23361
1968	28511
1969	27536
1970	33776
1971	38647
1972	39106
1973	31939
<b>Total</b>	<b>270330</b>

Source : Same as for table No. 3.2

On the basis of the data presented above, we now attempt to project the figures of brain-drain for all years upto 1981. For this purpose we use the method of the Least squares where the regression analysis can be applied. By following a streight line equation of rereession of X on Y, the trend values of Yc (computed y)

where

Y = figures of brain drain

and

X = time have been calculated.

The following equation gives us the final figures of trend values of Yc.

$$Y_c = a + b(x)$$

where

Yc = computed Y

Y = brain-drain

$$a = \frac{\sum Y}{N} \text{ (where } N = \text{No. of years for which figures are known)}$$

$$b = \frac{\sum xy}{x^2}$$

and : X = time period or plus/minus variations from midyear of the base data.

Table 3.9 gives the values of  $\sum X, \sum X^2, \sum XY, \sum X^2$  and trend values.



Table No. 3.9  
Brain-Drain from less developed Countries to USA.  
and trend values.

Year	Y	X	X	Y
1963	11029	- 5	- 55145	25
1964	11418	- 4	- 45672	16
1965	11001	- 3	- 33003	9
1966	13986	- 2	- 27972	4
1967	23361	- 1	- 23361	1
1968	28511	0	0	0
1969	27536	1	27536	1
1970	33776	2	67592	4
1971	38647	3	115941	9
1972	39106	4	156424	16
1973	31939	5	159645	25
<b>N = 11</b>	<b>270330</b>		<b>342035</b>	<b>110</b>

On the basis of the above table and trend values, the trend values for this period 1974 to 1981 have been projected and the same are shown in the following table ( Table 3.10)

Table No. 3.10Extent of Brain-Migration from India to USA ('1963to 1981).

Year	From LDC'S to USA (Projected trend values)	From India to USA (Projected trend values)	Cumulative Total
1963	9030	951	951
1964	12139	1278	2229
1965	15248	1606	3835
1966	18357	1933	5768
1967	21466	2260	8028
1968	24575	2588	10616
1969	27684	2915	13531
1970	30793	3243	16774
1971	33902	3570	20344
1972	37011	3897	24241
1973	40120	4225	28466
1974	43229	4552	33018
1975	46338	4879	37837
1976	49447	5207	43044
1977	52556	5534	48578
1978	56665	5862	54440
1979	58774	6189	60629
1980	61883	6516	67145
1981	64992	6844	73989

Note : India's share 10.53% taken to be constant.

In the 3rd (last) column of the above table the projected trend value for brain drain from India to USA ( taking 10.53% to be the constant share of India, in brain drain from all developing countries) have been presented while the 4th column give the cumulative total of the brain-drain from India to the USA at the end of each year. The final figure thus, for India's brain-drain to USA during 1963 to 1981 comes to be 73989 and we use this estimated extent of brain-drain, throughout our study for the purpose of further analysis.

#### 3.4 CAUSES AND IMPLICATIONS OF BRAIN\_DRAIN :-

There are, as mentioned earlier, a number of studies conducted on the problem of brain-drain. The causal factors behind the increasing brain-drain from the underdeveloped countries have been mentioned in some of the studies. The main causes of brain-drain appearing in the literature are summarised below. This will be followed by a similar summary of the implications of this problem for the countries like India.

##### 3.4.1 CAUSES OF BRAIN\_DRAIN :-

Brain-drain from less developed countries to the developed ones is a result of several factors for US simultaneously working on the mind of the prospective migrant. S Nagarajan<sup>9</sup> has given the following causes of brain-drain :

- 1) Education has not been commensurate with national needs.  
i.e. it is more than what the home economy is able to use.
- 2) Talent and ability to perform go unrecognised or unrewarded.
- 3) Jobs do not exist for people trained for specific professions.
- 4) Advancement is more often based on social status or family income than on professional ability.
- 5) Discrimination on the basis of sex, social class, race or entrenched economic or political interests are noticed.

The causes listed above indicate the research gap, economic gap and social gap existing between the countries of emigration and immigration.

#### 3.4.2 UNITAR REPORT :-

UNITAR<sup>10</sup> study is perhaps the most systematic fact finding study in respect of brain-drain. It has given the following factors or causes responsible for migration.

##### I WORKING CONDITIONS :

- a) Potential contributions to the emigrants profession.
- b) Potential income and living standards.
- c) Quality of jobs available.
- d) Number of jobs available.

e) Satisfactory housing at a reasonable price.

II) PROFESSIONAL NEEDS :

a) Contact with developments in the profession through travel, access to current publications etc.

b) Sufficient time for professional development free of routine work,

c) Library facilities.

d) Equipment.

e) Laboratory or Office space.

f) Status of professionals in pay and prestige in comparison with other occupations.

III) COLLEGGUES.

a) Research workers with whom the immigrant can discuss the problem.

b) Skilled assistants with specialisation.

IV) SOCIAL SETTING :-

a) Difference in the cultural level.

b) Challenge of life.

v) POLITICS :-

- a) Political conditions.
- b) The governments policies.

The other factors mentioned in the study by UNITAR are the factors which make the immigrants go back to their home country.

3.4.3 PULL AND PUSH FACTORS :-

On the whole, there are some factors which 'pull' the skilled manpower to the developed countries, while there are factors which push the manpower from less developed countries.

The push factors include :

- a) Low wages and salaries.
- b) Lack of research and other facilities.
- c) Lack of freedom.
- d) Desire for better life.
- e) Desire for higher qualification.
- f) Lack of satisfactory working conditions.

The pull-factors include :

- a) Job-oppertunities.
- b) Higher salaries/wages.

- c) Better research facilities.
- d) Better working conditions.
- e) Relative political stability.
- f) Frequent chances of a lucky break in life.

#### 3.4.4 THE TWO MAJOR FACTORS :

The factors mentioned above highlighted by some studies ultimately suggest two most important factors and they need a little more explanation. :

##### 1) DIFFERENCE IN EARNINGS :

The most important factor responsible for migration is the difference in the earnings of the brain in the countries of his emigration and immigration. The per capita incomes differ in the two countries mainly since the home country of the emigrant is less developed as compared to the country of immigration, but the difference in the earnings of the qualified persons is often far greater than the difference in the per capita incomes. The gap between the incomes in the two countries results in the difference relating to the standard of living, status, importance of an individual, social standing, honour and prestige availability of modern amenities of life and so on. The person who migrates first on temporary basis, does not feel like coming back to the home country as he becomes habituated to the life style in the developed countries. Thus, the

difference in the earnings and a natural urge for improving the standard of living is the first important reason of brain-drain.

2) DIFFERENCE IN ENVIRONMENT :

The second important reason for brain-migration is the difference in environment in the two countries. The term 'environment' here is used to describe the complex of work environment, social environment and political environment. These environmental conditions substantially differ in the two countries. The difference results in, facilities at the work place, quality of colleagues, the regards for better performance, the techniques available, the political conditions making totally different in the two nations.

3.5 IMPLICATIONS OF BRAIN\_ DRAIN :-

Brain-Drain results in the following economic effects :

- 1) Loss of investment in human capital (educations and training).
- 2) Loss of potential income from the emigrants.
- 3) Loss of Tax revenue from such emigrants.
- 4) Loss of potential Savings by the emigrants.



Besides these economic effects, brain-drain has other implications in the form of loss of,

- 1) Research and other innovations by the emigrants.
- 2) Improvement in the techniques by the emigrants.
- 3) External economics of such emigrants.

Thus the 'Brain-Drain' has got many implications which will be gauged in the next chapter of this study.

### 3.6 CONCLUSIONS :

To put in a nutshell, it can be stated that Brain-Drain is very difficult to define particularly since Brain-overflow and Brain-Drain are overlapping concepts.

There are various estimates about the extent of Brain-Drain but due to non-availability of latest figures, the data have been projected by following the least square method.

The main causes of Brain-Drain are the difference in the earnings and the environmental conditions as between the less developed countries and the developed ones.

Brain-Drain implies same economic losses as well as some non-economic losses for the home country of the emigrants; apart from some political and cultural irritants the immigrants tend to gradually mix with the nationals of the country of immigration.

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