No.84

SOME CORRELATES OF MALE PARTICIPATION IN THE NON-AGRICULTURAL LABOUR FORCE IN WEST PAKISTAN

by

Farhat Yusuf

October 1969

SOME CORRELATES OF MALE PARTICIPATION
IN THE NON - AGRICULTURAL LABOUR
FORCE IN WEST PAKISTAN

Farhat Yusuf*

INTRODUCTION

The economies of most of the under-developed coun-
tries depend heavily on agriculture, as a result, such
countries are characterized by the much smaller size of their
non-agricultural labour force.[1] For example, according to the
1961 Census of Pakistan, the proportion of male labour force
reported as engaged in non-agricultural occupations was only
27.3 per cent, it ranged between 7.0 and 72.8 per cent in
East and between 11.9 and 76.2 per cent in the administrative
districts of West Pakistan $/\bar{1}4\bar{/}$. The extent of male
participation in non-agricultural labour force is affected
by various social, cultural, economic and demographic

1. Throughout this paper the term labour force signifies
    labour force aged 10 years and over as defined
    subsequently.

variables $\underline{/5},16,18\underline{/}$. Information about some of these variables is available from the 1960 Housing and the 1961 Population Censuses of Pakistan. In this paper the available census statistics have been utilized to study the interrelationships between these variables and the extent of male participation in non-agricultural labour force in the administrative districts of West Pakistan.

DATA

The basic data utilized in this paper consisted of statistics about 20 characteristics for each of the 45 districts of West Pakistan (see Table I). All these statistics were derived from various publications of the 1960 Housing and the 1961 Population Censuses of Pakistan $\underline{/9},10,11,12,13,$ $14,15\underline{/}.$ [2] Before presenting the results of the analysis of these statistics it is desirable to list the concepts and their definitions as used by the data collecting agencies or adopted in this paper.

In the 1961 Census of Pakistan a person was enumerated as literate if he/she could read "with understanding" a statement in any language $\underline{/11\underline{/}}$. Thus, persons who could not write were also included in the category of literates. [3]

---

2. It may be noted that for items (a) through (i), (s) and (t), the percentages were calculated only for persons of age 10 years and over.

3. Persons who could read HOLY QURAN only without understanding were not taken as literates.

Persons who were counted as literates were asked to report whether they had any formal schooling and the highest grade passed $\sqrt{11}$. [4]

An area with a population of 5000 or more was treated as an urban area if in the opinion of the Provincial Director of Census the area had "pronounced urban characteristics, .. e.g. common utilities, roads, sanitation, schools and specially non-agricultural occupation of the people" $\sqrt{9}$. In some cases even areas of less than 5000 population were treated as urban if they had pronounced "urban characteristics".

The density of population was defined as the number of persons per square mile. It may be noted that unlike East Pakistan the geographical area of West Pakistan districts remain practically the same whether rivers, are included or excluded. Thus, in the denominator of the density formula the area covered by rivers, canals etc. was not excluded.

A question about place of birth was asked from each person enumerated in the 1961 Census. We have defined as "non-migrants" all those persons who were enumerated in the same district where they were born.

Masculinity ratio for the group 20-49 years was defined as the number of males of this age bracket divided by the number of females of the same age group.

---

4. For limitations of the 1961 Census literacy data see $\sqrt{1,8}$.

The dependency ratio was defined as the number of dependents, (i.e. persons aged 0-9 and 60+ years) divided by the number of persons aged 10-59 years who were assumed to be economically active. It may be noted that because of the problems of digital preference and misreporting the quality of age data in Pakistan is quite poor /‾6.7.19‾7.

Families which belonged to either of the following, two categories were defined as "nuclear families": (1) husband and wife without sons or daughters, and (2) husband and /wife with own sons and/or daughters only. Information about both these categories was available from the 1960 Housing Census /‾15‾7.

All persons of age 10 years and over were classified as economically active if they were working for profit or earning wages or salary, helping any member of their families or were not working but looking for work. Students, housewives, beggars, prostitutes and all other persons who were neither working nor helping nor looking for work, were not considered as part of the labour force. Questions about occupation, industry and work status were asked from all persons included in the labour force. For non-agricultural workers the reference period was one week prior to the interview, while there was no such reference period for agricultural workers. It may be pointed out that the 1961 Census labour force data had many limitations. There were problems in the correct identification of the economically

active persons, particularly in case of housewives who were
reported sometimes as economically active and some times as
economically not active. Further, the fixation of lower
limit at age 10 resulted in concealment of the child labour.
It also affected the age groups 5-9 and 10-14 years, since
the enumerators were likely to report persons aged 10,11 or
even 12 years as less than 10 years, since by doing so they
were saved from the trouble of asking seven labour force
questions.[5]

METHODOLOGY

Besides the various measures of central tendency and
dispersion, the simple, partial and multiple correlation
coefficients were used to study the interrelationships
between the per cent of males engaged in non-agricultural
occupations and the other variables listed in Table 1. The
ecological correlations were computed because of the non-
availability of data on the characteristics of individuals.
It must be pointed out that the ecological correlations
presented in this paper should be considered merely as
indicative of possible interrelationships between different

5.   For more details of limitations of the labour force
        data see /¯6,7_7.

group characteristics and for this reason caution is given
that no inferences may be drawn with respect to the behaviour
of the individuals. For a discussion of the problems of
interpreting the ecological correlations as indicative of the
individual behaviour see $\sqrt{17\_7}$.

RESULTS

Table I shows some measures of central tendency and
dispersion computed for the 20 characteristics of the 45
districts of West Pakistan. The table shows that the levels
of literacy and education were quite low - particularly so
in case of females, less than one-fifth of the population
was living in urban conglomerations, the density of popula-
tion was moderately high, the population was quite immobile,
the dependency load was heavy, women were mostly engaged in
the household activities and male participation in non-
agricultural labour force was quite low. The inter-district
comparison for each variable shows that there was substantial
variation in the characteristics of each district. This is
also evident from the "Standard deviation" column of Table
I. The coefficients of variation for variables (b), (h), (i)
and (k) were in excess of 100 per cent, while those for
variables (d), (f), (g), (j) and (s) varied between 50-99
per cent and for the remaining variables the coefficients
of variation were less than 50 per cent.

Further, it is evident from Table I that districts like Karachi which had higher rates of male participation in non-agricultural labour force were characterized by higher levels of literacy and education, were substantially more urbanized, had large number of migrants and had lower dependency load, while districts like Mekran, Kharan, Lasbela etc, which had lower rates of male participation in non-agricultural labour force were characterized by low levels of literary and education, less urbanization and high dependency load.

It must be pointed out that part of the observed inter-district variation could well be due to the vagaries of the data, for example, the highest female participation in labour force was recorded in the district of Jacobabad. This seems quite implausible as Jacobabad district ranked quite low in terms of the various other indexes of modernization.

The ecological correlations between the per cent of males in non-agricultural labour force and the 19 selected characteristics of the 45 districts of West Pakistan have been presented in Table II. These characteristics have been classified into three categories:
(1) literacy and education, (2) urbanization and migration, and (3) dependency load. The first category includes variables (a) through (i), the second includes variables (j) through (m) and the third category includes variables

(n) through (s).

All the components of the "literacy and education" category showed positive correlation with the male participation in non-agricultural labour force. The correlation coefficients were statistically significant at 5 per cent level, except the one involving per cent of males who had completed 1-4 years of schooling. It is interesting to note that for the same level of education the correlation coefficient was higher for females compared to that for males.

TABLE I - SOME MEASURES OF CENTRAL TENDENCY AND DISPERSION FOR THE 20 SELECTED CHARACTERISTICS OF THE 45 DISTRICTS OF WEST PAKISTAN

Characteristics	Mean	S.D.*	Range Highest	Range Lowest
1. Per cent of literated males	23.04	9.71	50.30 (Rawalpindi)	6.50 (Lasbela)
2. Per cent of literate females	5.63	5.64	33.60 (Karachi)	0.50 (Kharan)
3. Per cent of male who had completed 1-4 years of schooling	6.96	3.23	14.20 (Sukkur)	1.90 (Kalat)
4. Per cent of females who had completed 1-4 years of schooling	1.80	1.48	8.30 (Karachi)	0.10 (Kharan)
5. Per cent of males who had completed 5-8 years of schooling	9.71	4.42	22.20 (Jhelum)	1.80 (Lasbela)
6. Per cent of females who had completed 5-8 years of schooling	2.09	2.06	10.30 (Karachi)	0.20 (Mekran/Kharan)
7. Per cent of males who had completed 9-10 years of schooling	3.61	2.71	14.30 (Karachi)	0.70 (Kharan)
8. Per cent of females who had completed 9 or more years of schooling	0.65	1.20	7.40 (Karachi)	0.40 (Kharan)
9. Per cent of males who had completed more than 10 years of schooling	0.74	0.80	4.60 (Karachi)	0.10 (Kalat/Kharan)
10. Per cent of urban population	18.90	15.49	93.60 (Karachi)	3.50 (Lasbela)
11. Density of population	287.75	316.24	1506.00 (Karachi)	2.00 (Kharan)
12. Per cent of non-migrants	84.24	12.38	98.80 (Mekran/Kharan)	41.70 (Karachi)
13. Masculinity ratio for the age group 20-49 years	113.97	12.89	159.40 (Karachi)	87.30 (Kohat)
14. Per cent of population of age less than 15 years	43.13	2.37	47.90 (Chagai)	37.10 (Dadu)
15. Per cent of population of age 60 years and over	6.50	1.35	8.70 (Dadu/Jhelum)	3.40 (Zhob)
16. Dependency ratio	67.46	6.04	78.00 (Hazara)	52.10 (Karachi)
17. Per cent of nuclear families	52.21	5.97	71.20 (Mekran)	39.90 (Larkana)
18. Child-women ratio	881.74	86.21	1072.00 (Chagai)	721.20 (Sialkot)
19. Per cent of females in labour force	9.55	8.09	41.90 (Jacobebad)	0.30 (Chagai)
20. Per cent of males in non-agricultural labour force	28.32	10.78	76.20 (Karachi)	11.90 (Kharan)

* Standard deviation

The per cent of males in non-agricultural labour force had positive correlations with the per cent of urban population, density of population and masculinity ratio for the age group 20-49 years and negative correlation with the per cent of non-migrants. All the correlation coefficients of the "urbanization and migration" category were statisitcally significant at 5 per cent level.

Among the six components of the "dependency load" category, only the per cent of nuclear families exhibited a positive correlation, while the other five variables showed negative correlations with the per cent of males in non-agricultural labour force. Only the correlation coefficients involving dependency ratio and per cent of females in labour force were significant while the remaining four coefficients were not significant at 5 per cent level.

Further, it is evident from Table II that in terms of the "explained variation"[6], the following components of the three categories of independent variables scored highest among the components of their respective categories: (1) per cent of males who had more than 10 years of schooling ("literacy and education" category), (2) per cent of urban population ("urbanization and migration" category) and (3) dependency ratio ("dependency load" category).

---

6. The coefficient of determination, which is the square of the coefficient of correlation, is an index to measure the "explained variation", that is, the extent of variation in the dependent variable which can be explained by variations in the independent variable.

On examining the interrelationships between the components of "literacy and education", "urbanization and migration" and "dependency load" categories, it was noted that positive correlation existed between the components of first and second categories, while the components of first and third, and second and third categories were generally inversely correlated.[7] Because of these interrelationships between the three categories of independent variables, the simple correlation coefficients are likely to be misleading, since they do not allow us to isolate the effect of one or more independent variables on the dependent variable. In order to be able to achieve this goal, at least partly, the partial and multiple correlation coefficients were computed.

---

7. These observations are based on the 19 x 19 correlation matrix which has not been included in this paper due to the shortage of space.

TABLE II -CORRELATION COEFFICIENTS BETWEEN THE PER CENT OF
MALES IN NON - AGRICULTURAL LABOUR FORCE (t) AND
SOME SELECTED CHARACTERISTICS OF THE 45 DISTRICTS
OF WEST PAKISTAN

Characteristic	Correlation coefficient	Standard error
Per cent of literate males (a)	0.685	0.080
Per cent of literate females (b)	0.884	0.033
Per cent of males who had completed 1-4 years of schooling (c)	0.201*	0.145
Per cent of females who had completed 1-4 years of schooling (d)	0.770	0.061
Per cent of males who had completed 5-8 years of schooling (e)	0.518	0.110
Per cent of females who had completed 5-8 years of schooling (f)	0.851	0.000
Per cent of males who had completed 9-10 years of schooling (g)	0.848	0. 000
Per cent of females who had completed 9 or more years of schooling (h)	0.861	0.039
Per cent of males who had completed more than 10 years of schooling (i)	0.863	0.038
Per cent of urban population (j)	0.880	0.034
Density of population (k)	0.761	0.063
Per cent of non-migrants (l)	-0.700	0.077
Masculinity ratio for the age group 20-49 years (m)	0.519	0.110
Per cent of population of age less than 15 years (n)	- 0.274*	0.139
Per cent of population of age 60 years and over (o)	- 0.083*	0.150
Dependency ratio (p)	- 0.577	0.101
Per cent of nuclear families (q)	0.118*	0.149
Child-women ratio (r)	- 0.270*	0.140
Per cent of females in labour force (s)	- 0.302	0.137

*   Correlation coefficient not significant at 5 per cent level.

Presented below are some simple and partial correlation coefficients between the per cent of males in non-agricultural labour force and the three variables, which in terms of the "explained variation" scored highest among the components of their respective categories:[8]

Literacy and
education: $R(it) = 0.863$ $R(it.j) = 0.212$ $R(it.p) = 0.800$

Urbanization and
migration: $R(jt) = 0.880$ $R(jt.i) = 0.394$ $R(jt.p) = 0.818$

Dependency
load: $R(pt) = -0.577$ $R(pt.i) = -0.240$ $R(pt.j) = -0.144$

It is apparent from these statistics that the correlation between per cent of males in non-agricultural labour force (t) and per cent of males who had completed more than 10 years of schooling (i), and dependency ratio (p) decreased substantially when the effect of per cent of urban population (j) was held constant. Similarly, the holding constant of the per cent of males who had completed more than 10 years of schooling also resulted in substantial drop in the correlations between male participation in non-agricultural labour force and the per cent of urban population and dependency ratio. However, the correlation coefficients $R(it)$ and $R(jt)$ were not significantly affected when the dependency ratio was held constant, showing thereby that the effect of

---

8.   The lower case alphabets refer to the variables listed in Table I. We have used R to denote the simple, partial and multiple correlation coefficients.

education and urbanization on male participation in non-
agricultural labour force was independent of the effect of
dependency ratio. The multiple correlation coefficient
$R(t.ij)$, which shows the joint effect of variables (i) and
(j) on the male participation in non-agricultural labour
force was 0.887. The addition of dependency ratio in the
calculation of multiple correlation coefficient did not
change the value of the coefficient to any great extent,
$R(t.ijp)$ was 0.888. This means that about 79 per cent of the
variation in the male participation in non-agricultural
labour force in the 45 districts of West Pakistan could be
explained by variation in the per cent of males who had
completed more than 10 years of schooling and the per cent
of urban population.

CONCLUSIONS

The analysis presented in this paper has shown that
the incidence of male participation in non-agricultural
labour force was affected by the levels of literacy and
education, by the proportion of urban population and the
extent of rural to urban migration, and other variables such
as dependency ratio and female participation in labour force.
Most of these explanatory variables were interrelated among
themselves, for example, districts which had higher proportion
of literate and educated population also ranked high in terms
of urbanization and rural to urban migration.

It was noted that a large proportion of variation in the
male participation in non-agricultural labour force in the
45 administrative districts of West Pakistan could be
explained by variations in the levels of literacy and
education and the extent of urbanization and rural to
urban migration. Thus, it seems that these factors are
among the important determinants of the incidence of male
participation in non-agricultural labour force in the
districts of West Pakistan.

REFERENCES

1.   Akhtar, Jamila, "Literacy and Education: Fifth Release
         from the 1961 Census of Pakistan", The Pakistan
         Development Review, Vol 3, Autumn 1963, pp.424-442

2.   Afzal, Mohammad, "Migration and Supply of Non-Agricul-
         tural Male Labour Force in the Cities of Pakistan,
         1960", mineographed paper presented to the
         Seminar on Population Problems in the Economic
         Development of Pakistan held at Pakistan
         Institute of Development Economics, Karachi.
         June 2-3, 1967.

3.   Bean, L. L.   , "Demographic Aspects of Potential
         Labour Force Growth in Pakistan", International
         Union for the Scientific Study of Population:
         Contributed Papers, Sydney Conference, Sydney,
         August 21-25, 1967, pp. 87-97.

4.   Bean, L.L. Danial M. Farooq and Masihur Rehman Khan,
         "The Labour Force of Pakistan: A Note on 1961
         Census", The Pakistan Development Review, Vol. 4,
         Winter 1966, pp. 587-591.

5.   Denti, Ettore, "Sex - Age Patterns of Labour Force
         Participation by Urban and Rural Population",
         International Labour Review, Vol. 98, December
         1968, pp. 525-550.

6.   Farooq, Ghazi Muntaz, "Labour Force Participation
          Rates in Pakistan", The Pakistan Development
          Review, Vol. 8, Spring 1968, pp. 74-95.

7.   Hashmi, Sultan S., "Main Features of the Demographic
          Conditions in Pakistan", Country Background
          Paper, Asian Population Conference, New Delhi,
          December 10-20, 1963.

8.   Jilani, M.S., "Changes in Levels of Educational
          Attainment in Pakistan, The Pakistan Development
          Review, Vol. 4, Spring 1964, pp. 69-92.

9.   Pakistan, Population Census of Pakistan 1961, Final
          Tables of Population, Sex, Urban-Rural, Religion,
          Census Bulletin 2, Office of the Census
          Commissioner, Government of Pakistan,
          Islamabad, 1961.

10.   Pakistan, Population Census of Pakistan 1961, Age
          Sex and Marital Status, Census Bulletin 3,
          Office of the Census Commissioner, Government
          of Pakistan, Karachi, 1962

11.   Pakistan, Population Census of Pakistan 1961,
          Literacy and Education, Census Bulletin 4,
          Office of the Census Commissioner, Government
          of Pakistan, Karachi, 1962.

12. Pakistan, Census of Pakistan Population 1961, Pakistan Tables and Report, Vol. 1, Office of the Census Commissioner, Government of Pakistan, Karachi, undated.

13. Pakistan, Census of Pakistan Population 1961, West Pakistan, Tables and Report. Vol. 3, Office of the Census Commissioner, Government of Pakistan, Karachi, undated.

14. Pakistan, Census of Pakistan Population 1961, Non-Agricultural Labour Force, West Pakistan, Vol. 6, Office of the Census Commissioner, Government of Pakistan, Karachi, undated.

15. Pakistan, Census of Pakistan, Housing 1960, West Pakistan, Vol. 10, Office of the Census Commissioner, Government of Pakistan, Karachi, undated.

16. Penninent, J.S., "The Influence of Cultural and Socio Economic Factors on Labour Force Participation Rates", Proceedings of the 1965 World Population Conference, Vol. 4, United Nations, New York, 1967, pp. 318-321.

17. Robinson, W.S., "Ecological Correlations and the Behaviour of Individuals", American Sociological Review, Vol. 15, 1950, pp. 351-357.

18.   Stewart, C.M.,"Degree of Urbanization and Patterns of
          Labour Force Participation", Proceedings of the
          1965 World Population Conference, Vol. 4,
          United Nations, New York, 1967, pp. 327-332.

19.   Yusuf, Farhat, "On the Extent of Digital Preference
          in Reporting of Ages in Pakistan", The Pakistan
          Development Review, Vol. 7, Winter 1967 ,
          pp. 519-532