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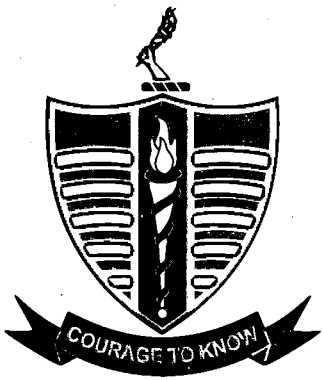

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INCOME AND EMPLOYMENT SITUATION OF LANDLESS NON-FARM LABOR FORCE IN LOWER RURAL PUNJAB

Rana Ejaz Ali Khan, Karamat Ali and Shahnawaz Malik *

ABSTRACT

Asian Development Bank [ADB 2000] underscored the need for greater stability of income and employment in rural areas of Pakistan by focusing on policy and institutional framework, which includes expansion of non-farm employment. In the present study we probed into the income and employment situation of rural landless households considered to be the lowest income group of the rural population. The study provides the planners and policy makers the statistics about income and employment level of that focus group. It may help to formulate rural industrial policies and programs and ascertain the training needs of the target group labor force for the creation of healthy economic environment. We found that the focus group confronts problems of mass unemployment and under-employment. The rural infrastructure, community work programs, rural industrialization, credit facilities, involvement of NGOs and Bait-ul-Mal are recommended to enhance the income and employment of the target group.

1. INTRODUCTION

Pakistan's labor force has been increasing at an annual growth rate of 2.4%, while the average annual GDP growth rate of 4.5% during the 1990s was insufficient to generate necessary additional employment. The average employment elasticity in Pakistan is estimated to be 0.4, which means additional jobs created in the 1990s provided employment to only about two-fifth of new entrants into the labor force. The two-third population of Pakistan lives in rural areas, where agriculture sector overcrowded by labor force cannot absorb fast growing rural labor force. Moreover, the increasing landless labor in rural Pakistan has pushed the rural labor force into low productive non-farm sector, where the labor market is characterized by unemployment, under-employment, disguised unemployment, low wages and low productivity of labor. As a consequence a substantial segment of non-farm labor force has lower level of earnings. This finally results into poverty and misery. SPDC [2001] noted that access to employment reduces poverty incidence by 18%. [See also Arif *et al* 2000]. Therefore the core of the poverty problem of Pakistan is rural [Hussain 1999]. The current official rate of unemployment of 7.8% grown from 6.1% in 1999 is incredible. It is observed that 0.6 million people are being added to the rank of unemployment every year [ADB 2002]. The urban under-employment rate of the country is 12.7% and vast majority of the underemployed (83%) lives in

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rural areas and most of them are illiterate. The unemployment and under-employment in rural areas is accompanied by disguised unemployment, seasonality of job opportunities, lack of alternative job avenues, lack of skill and existence of traditional apathy towards improvement of various skills, strong occupational bondage, absence of agrobased/cottage industry, insufficiency of education and low earnings of labor force. Although the official unemployment figures are considerably higher, but SPDC [2001] described that unemployment rate increased from an average of 3.5% during 1981-1990 to 5.7% during 1991-2000, and it rose to 6.7% in 2000-01. Poverty reduction primarily depends on employment generation. Consequently, the percentage of population living below the poverty line increased from 31% in 1979 to 33 %in 1999. The poverty level in 2000-01 is the same as it was in 1964, i.e. 40.2%.

Most of the income in rural areas is seasonal which makes the demand for consumption goods and services seasonal, so employment opportunities for landless non-farm labor force are not available throughout the year contributing to the under-employment of labor force and lower income. The landless labor force is vulnerable group of the society [Lanjouw 1999]. Kardar [1987:147] noted that in a survey, casual workers in the rural areas of Punjab earn almost 40% less than the minimum amount earned by an urban beggar.

The low income/earnings represent the characteristics of informal sector in rural areas. The household subjective preference regarding profession and unemployment depends on the household's social class or caste status. Traditionally, the caste status called Biradri in Punjab is identified with an occupational position. For example, agricultural landless laborers and artisans are strictly distinguished from landowners. This system of caste has prevailed in the form of social norms, and members of each class are expected to act according to their social and economic status.

The rural population have lower standard of living compared to their urban counterparts [Arif *et. Al* 2000]. Among others it is attributed to high unemployment and underemployment. The average income for a household in rural areas is less than that of urban areas which has been highlighted in all the Household Income and Expenditure Surveys (HIES) [Saeed 2000].

In the economic literature concerning rural employment most of the studies have focused on farm households and consequently non-farm households have received little attention. The reasons for not conducting studies on non-farm households are as follows: first the increment of agricultural production has been the prime and urgent concern of policy makers and academicians. Secondly, non-farm households generally represent the lower section of the society and suffer from lower status in the rural areas. Finally non-farm households find casual employment in village economy to meet their subsistence needs.

Development economists have become increasingly conscious of the social aspect of economic development. The fundamental problem of economic development is not how to create but to increase the capacity of all the people to

create wealth and distribute it equitably amongst them. It is now generally realized that economic growth should be a mean towards the eradication of existing social and economic inequalities, unemployment and or under-employment. So landless non-farm labor force should be considered as an agent of change in the economy specifically in rural community because it is the major part of the country's non-utilized or under-utilized labor force. Lanjouw [1999] dictates that specific attention should be given to non-farm labor force for economic growth. Arif *et. al* [2000] concluded that spread of employment and income of non-farm labor force may result in rapid growth, egalitarian distribution and elimination of rural poverty.

The outcomes of Pakistan's economic development have not been distributed evenly in the provinces of the country. Punjab is richer than other provinces but within the province disparity exists. Punjab is divided into upper Punjab (Rawalpindi division and district of Mianwali from Sargodha division), lower Punjab (Multan, Bahawalpur and Dera Ghazi Khan divisions) and middle Punjab (Lahore, Gujranwala and Sargodha divisions excluding district Mianwali). Middle and lower Punjab show in general, greater inequality than upper Punjab. Lower Punjab is unambiguously the poorest region, regardless of the choice of poverty line, welfare indicators, or assumptions about household size and consumption effect. Moreover lower Punjab shows, in general greater inequality than upper Punjab [Gazdar 1999:291,302].

The use of administrative boundaries for the purpose of socio-economic segregation is not, of course, the best way to proceed. But there are certain advantages in doing so, which do possibly mitigate the disadvantages. There is a geographical basis for focusing on regional variations within Punjab, which can provide useful results for analysis of income and employment situation of the focus group. Within Punjab, Potohar Plateau and surrounding high lands are contrasted with rest of the province in agronomy. Moreover these areas in upper Punjab are barani areas and rest of the Punjab (Middle and Lower Punjab) is served by canal irrigation and tube wells. Middle and Lower Punjab again are different, as lower Punjab have a higher concentration of landownership, and a strong political presence of powerful landowners.

Lower Punjab comprises of 23.7% of total population of Pakistan that is higher than the upper and middle Punjab, while population wise Punjab is the biggest province of Pakistan and comprises of 64% of the population of Pakistan. In lower Punjab 42.3% of the rural households are landless and 20.8% of rural work force is related to non-agriculture. The literacy rate (in 10+ age group) is only 15.9% as compared to 21.0% in middle Punjab and 27.3% in upper Punjab [Gazdar 1999:228]. These facts justify the study to focus on lower Punjab regarding income and employment situation of labor force.

1.1 Objectives

The facts on landless non-farm rural labor force are needed in many areas; nevertheless, to keep the study within a meaningful and manageable frame of analysis, it has been narrowed down to the following goals:

1. To analyze the income, mode of income and periodicity of income of non-cultivating landless labor force.
2. To analyze the employment and under-employment status of labor force
3. To estimate the child labor force participation of focus group

The scope of the study is confined to non-farm and casual labor force so it does not include all the categories of landless rural household like government employees, educated and trained permanent employees of corporations or private enterprises, etc.

2. METHODOLOGY

The study has been divided into four sections. The first section describes the introduction. The second section, methodology consists of related definitions and concepts, and sampling and collection of data technique. In the third section the results are discussed. In the last and fourth section some recommendations have been framed.

2.1 Definitions and Concepts

Non-farm households

There are several approaches in rural economic literature to define non-farm sector, one approach is to identify non-farm sector by industry. Qureshi and Arif [2001] have classified farm and non-farm categories on the reported "industrial status" of the individual. If the status was agriculture it was considered a farm activity. The rest of the individuals were grouped into the non-farm activity. Arif *et al* [2000] have classified labor force into farm and non-farm activities on the basis of occupations. We have also focused on the occupational aspect of the labor force to define farm and non-farm households. Farm households include households reporting any farm area irrespective of its tenure, i.e. rent receivers, tenant cultivators, owner cultivators, owner-cum-tenant cultivators (subsidiaries of agriculture like dairy farming, poultry farming etc. are also considered as farm activity). Non-farm households are further divided into "kamees and non-kamees" households. Kamees are households who have a "seyp relationship" (households who have annual employment contract with farm households, taking seasonal income in kind on harvesting of the crop). These households include carpenter, blacksmiths, shoemakers and barbars, etc. Non-kamees are households who have non-seyp like relationship with farm households. These households include shopkeepers, masons, drivers, milkmen and laborers etc.

Landless households

It refers in the study to households, which have no access to farmland regarding cultivation.

Income/Wage

A large variety of professions exist in the rural areas and a number of modes of payments are used for payment, i.e. cash, kind, and the payments are made daily, weekly, monthly, biannually, seasonally and annually. To calculate the income/wage of the households the value of the kind is added to the cash and adjusted per month.

Employed labor force

All the persons of 16 years of age or above who worked at least one hour during the reference period (one week) and were either "paid employees" or "self employed".

Unemployed labor force

All the persons of 16 years of age or above who are terminated or temporarily suspended and seeking work for pay or profit, and are available for work and seeking work for pay or profit in the reference period.

Underemployed labor force

All the persons of 16 years of age or above who are willing to do more work than he/she is doing at present; he/she may either be actively searching for more work or need work if it is offered on terms to which he/she may either be actively searching for more work or need work if it is offered on terms to which he/she is accustomed; removable from his/her present employment in the sense that contribution to output is so small that his/her removal would not reduce output; and/or who worked less than thirty five hours per week in the reference period and are available for additional work.

2.2 Sampling and Collection of Data

District Pakpattan is situated in Lower Punjab. It is selected due to its specific characteristics regarding land holding, income group and rural development. These features make the district to represent the Lower Punjab. There are a large number of villages in Pakpattan. The present study is confined to four villages i.e. 26/SP, Sardool, 56/SP and Wan Bodla. These villages represent the average conditions of the district.

The personal interview method was adopted to collect the data. For the purpose of field survey, 220 households of the target group were interviewed. It is assumed that landless non-farmers by virtue of their experience in their

respective field/occupations are aware of the extent of the use of labor in different operational activities and hence are able to give reliable and consistent information about employment, under-employment and income/wage. To analyze the data simple arithmetic techniques are used.

3. RESULTS AND DISCUSSION

The study was based on data collected from landless non-farm rural households from four villages of District Pakpattan. The landless non-farm labor force of the sample area was found working as: carpenter, iron smith, cobbler, barber, taili (oil seller), kumhar (potter), tailor, weaver, shopkeeper, butcher, imam masjid, laborer, employee, mason, biopari (seller), driver, tonga driver, auto mechanic, cycle repairer, donkey cart owner, chokidar (watchman), band player, beggar, private servant, animal dealer and crop dealer. In the present study the findings are consistent with the theoretical hypothesis of target households.

The analysis of the landless non-farm labor force reveals that:

- Annual per capita income of the focus households group is very low
- Average income of the adult labor force is also very low
- Average income of the child labor is one twentieth of that of an adult
- More than half of the adult labor force (16 years and above) receive income seasonally
- A large majority of the adult labor force is illiterate and underemployed
- Two-fifth of the adult labor fore is unemployed
- A significant part (14 percent) of the children (5-15 years) is economically active
- More than half of the school age children are doing nothing, i.e. they are involved in home care activity
- A vast majority of (89.69 percent) of the female school age children is doing home care

The detailed results are expressed in the tables. The income of the landless non-farm households is represented in table 1.

Table 1
Income of Landless Non-farm Households

Income	Rupees
Annual Per Capita Income	4923.21
Per Month Per Capita Income	410.26
Average Income of Household	2559 /Month
Average Income of an Earning Individual	712.17/Month
Average Income of an Adult	750 /Month
Average Income of a Child	37.5 /Month

The annual per capita income of the landless non-farm households is found only Rs.4923.21, as the annual per capita income of the country is Rs.29,000,

the figure puts the landless non-farm households in the lowest quarter of the per capita income group of Pakistan [Qureshi and Arif 2001]. The calculated per month per capita income stands at Rs.410. If the poverty line defined by Planning Commission of Pakistan at Rs.670 per capita per month is taken into account, on average whole of the population of sample lives below poverty line. As a matter of fact 92.6% of the households belonging to the sample are living below poverty line.

The average income of the household is found as Rs.2559/month while the average income of the poorest household in 1998-99 was Rs.1500/month [Tahir and Fatima 2001:25]. It means the target households fall in the poorest category of households living at subsistence level. As regards average income of an earning individual (adult and children), it is Rs.712/month and Rs.750/month. The figures conclude:

- The wage rates are very low in rural areas
- There is mass under-employment in the rural areas
- The business/professional or income opportunities are low
- The productivity of labor is low

The children are generally excluded from the economically active population. But in a country like Pakistan, where the primary education is not compulsory practically, the participation of children in various economic activities should not be ignored. The low level of current income of the household keeps poor children out of school and thus perpetuates their poverty into next generation [see, also, Baland and Robinson 1998]. As regards income of the child labor (in the age group of 5-15 years), it is only Rs.37.5/month on average. It is one-twentieth of the average income of an adult. The flow of the income of the labor force are shown in table 2.

Table 2
Flow of Income of Landless Non-farm Total Labor Force

Flow of Income	Percentage of the Labor Force
Daily	17.04
Weekly	5.71
Monthly	20.95
Seasonally (Three or Six monthly)	54.28
Seldom	2.00

The daily wagers/earners are 17% of the total labor force (adults and children). This type of labor force experience more fluctuations in their income and employment. They have to face the situation of employment or unemployment on daily basis. As a result of this, they have low bargaining power regarding wages. ADB [2002:77] narrated that volatility of income is one of the major causes of rural poverty.

The weekly income takers are only 5.71% and labor force taking income on monthly basis is 20.95 percent. The monthly wagers are best among the labor

force regarding the frequency of income period and the group faces comparatively less probability of unemployment or fluctuation in employment status. As regards the seasonal income earners the largest portion of the labor force falls in this category, i.e. 54.28%. Their flow of income represents that majority of them are engaged in sype system with landowner households. This class seems to be having high under-employment and disguised unemployment as the income is paid to the head of the household while whole family work for landowner households. The landowner households even do not spare the children.

For the seasonal income earners, it is difficult to manage the daily expenditures, so they have to remain passive to landowner households but this type of labor force has relatively less chances of unemployment.

A small ratio of labor force, i.e. 2 %has no regular flow of income. They receive income on the occasions like marriage ceremonies, death occasions, melas (traditional public gathering) and other social gatherings. They are severely under-employed. The mode of income of landless non-farm labor force is expressed in table 3.

Table 3
Mode of Income of Landless Non-farm Total Labor Force

Mode of Income	Percentage of Labor Force
Cash	42.85
Kind	17.14
Cash and Kind	40.95

It is assumed that the cash payment is the best mode of payment as compared to kind, kind and cash, because in the form of cash the income is specific and determined in monetary terms, while the income in the form of kind is non-specific in monetary terms. Our study shows that only 42.85% of the focused labor force is receiving the income in cash. While 17.14% of the labor force is receiving the income in kind. The income in kind has two types. In the first type the income is given in the form of food and clothes only. It may be considered as the daily flow of income. The cash is given very seldom usually on religious occasion like Eid and ceremonial family gatherings or marriages in landowing households. Majority of this type of labor force work as domestic servants in the homes of landowner households and as servants in "deras" (the area in the houses of the landlords exclusive for males for the purpose of meetings, sittings and residence of guests) and care for stud and dairy farms. Usually girls, children and women belong to this type of labor force. The second type of kind earners comprised of labor force contracted in sype system. The income in the sype system is given in the form of six monthly crops, usually wheat and rice. Both the kinds have relatively less monetary value. The monetary income of labor force depends upon the prices of the crops, which are comparatively low in the harvesting seasons, so the earners remained in disadvantage. They cannot wait for the rise in prices, because they need the

cash urgently as they have received the income after six months. Moreover the income in kind is never given in the form of valuable crops in monetary terms like the vegetable and other cash crops. The composition and characteristics of landless non-farm labor force are expressed in table 4.

Table 4
Composition and Characteristics of Landless Non-farm Labor Force

Composition and Characteristics	Ratio/Average
Adult Labor Force Participation	76.33 %
Average Number of Years of Education of Labor Force	0.96 Years
Illiterate Labor Force	72.51 %
Ratio of Child Labor Force in Total Labor Force	7.14 %
Ratio of School Going Children	17.24 %
Ratio of School Children (Male)	31.03 %
Ratio of School Going Children (Female)	3.44 %
Ratio of School Going and Working Children Simultaneously	Less Than One %
Child Labor Force Participation	13.79 %
Child Labor Force Participation (Male)	20.68 %
Child Labor Force Participation (Female)	6.89 %
Ratio of No-School No-Work Children	68.96 %
Ratio of No-School No-Work Children (Male)	48.27 %
Ratio of No-School No-Work Children (Female)	89.69 %

Labor Force Surveys have defined Refined Activity Rate (RAR) of labor force as the percentage of labor force in population having ten years of age and above. According to Labor Force Surveys 1999-2000 the RAR is 42.8%. In the present study, to segregate the adult labor force participation from child labor force participation, we used the age of adults as 16 years and above and of child 5-15 years.

The adult labor force participation in the landless non-form households is 76.33 percent. The average number of years of education of this labor force is less than one year and more than 72 %of labor force is illiterate. The illiteracy is one of the major causes of poverty in these households. Federal Bureau of Statistics (FBS) [2001] described that in rural areas of Punjab 75.73 % households were illiterate. Sawada and Lokshin [2000] found that more educated mothers and fathers seem to be better able to perceive the benefit of education than uneducated parents, since they can estimate returns to education more precisely. That is why the school participation rate of children is low in these households. The low school participation rate is generating unemployment and low-income level for future labor force.

To asses the future income and employment of these households, the activities of children from these households have also been analyzed. Child labor

force participation rate is 13.79 percent. Ratio of the child labor force participation in total labor force participation (adult and child labor force) is 7.14 percent.

Ratio of the school going children (5-15 years) is only 17.24% while for male children it is 31.03 %and for female children it is only 3.44 percent. The results show very poor school participation in these households. Sawada and Lokshin [2000:4] found that children, who had entered primary schools in rural areas of Pakistan, drastically increase the average years of child schooling. The school participation specifically for the target group of present study is more significant. Moreover, a high gender disparity exists in child's schooling in landless non-farm household [see also, Sawada 1997]. There are several possible explanations for the distinct gender gap in schooling. The high opportunity costs of daughter's education in rural Pakistan may lead to apparent intra-household discrimination against women in terms of education. Because of the custom of seclusion of women, purdah (veil), parents might have a strong negative perception of female education. But the low school participation of female and ultimately low level of female education has manifold implications. There is high degree of correlation between adult female literacy and lower infant mortality, high primary school enrollment and lower dropout and higher contraceptive prevalence rates. So the next generation of landless non-farm households, being without significant female literacy is going to be trapped by the vicious cycle of lower socio-economic status.

Sawada and Lokshin [2000:17] explained the low school participation as the farmers with landownership have high levels of educational investment at primary school level than landless farmers or casual labor force households. So the occupation, which is traditionally related to social status, affects educational investment decision at school level.

Nearly 14 %of children from the households are child laborers. The ratio for the male children is 20.68% while for female children it is 6.89 percent. These figures again show that human capital investment is very poor. Theory suggests that low level of education may have a strong negative effect on the country's long-term macroeconomic growth. Moreover illiteracy increases the unemployment and decreases the income level of the future adults.

The ratio of the children involved in no school no work or homecare activities is 68.96 percent. For male children it is 48.27 %while for female children it is 89.69 percent. The homecare children are actually sparing their adults for employment. The notion reveals that despite this fact, the adults are earning very low income. This means that the opportunity cost of home care children is very low and adults are underemployed, semi-employed or have low productivity. It also explains that even the low opportunity cost is significant for the low-income households.

The employment level of landless non-farm adult labor force is shown in table 5.

Table 5
Employment level of the Adult Labor Force

Employment level	Ratio
Adult Employed (16-60 Years)	56.05 %
Old Age Employed (61+Years)	27.27 %
Adult Unemployed (16-60)	38.93 %
Adult Under-employed (16-60)	91.42 %

We have divided the adults into two age groups, i.e. adults of 16-60 years of age and 61 and above. The purpose of this division is to show the hectic efforts of landless non-farm labor force to earn income even in the age of retirement. The adult employment ratio (16-60 years) of landless non-farm labor force is 56.5%, while 27.27% of the labor force in the age group of 60+ years is employed. The adult unemployment rate (16-60) is 38.93 %while under-employment rate is 91.42%. If these figures are compared with the national figures, i.e. 7.82% of the labor force (10 and above year of age) is unemployed, 12.7% of the labor force (10 and above years of age) is under-employed and 20% of the working age population (10 and above years of age) is under-employed or under employed [Tahir and Fatima 2001:26] found that the employment situation of landless non-farm is worse in the economy. SPDC [2000] found that 33% of the households living below poverty line belong to the unemployed labor force households and 42% of the households belong to under-employed labor force households in rural areas of Pakistan. The figures support the evidence that unemployment and under-employment is one of the major causes of poverty in landless non-farm household.

4. RECOMMENDATIONS

A deliberate program to formulate policy prescriptions towards any segment of the economy begins with serious efforts to collect quantitative facts about that segment. In view of the apparent magnitude of the problem in Pakistan, a large scale gathering of systematic data on the issue/problem of rural landless non-farm household is urgently required. It is important to strengthen the information and analytical insight into the state of rural landless non-farm households.

The sype system may be revised and monthly wages in the form of cash should be adjusted. In order to enhance the earnings of these households, a reasonable minimum wage should be ensured with appropriate daily working hours so that these landless laborers may be attracted to employment.

Training/vocational education can contribute to increase employment. To enhance the employment and income of female labor force, greater emphasis may be placed on the training of women folk in domestic and commercial skills like sewing, embroidery, and knitting. For this purpose existing industrial homes

may be strengthened in terms of facilities and funds and new industrial homes may be established in the rural areas.

Interest free or soft loans may also be provided to purchase and modernize the traditional implements. National Rural Support Program (NRSP), Khushhali Bank, Small and Medium Enterprises (SME) Bank and other micro-credit banks and commercial banks can provide the loan.

To improve the rural infrastructure specifically transport and roads may also play an important role in employment level of the rural labor force as it enlarges the labor market for employment in the nearest town or cities. Community Work Programs, Public Sector Development Programs, and Small and Medium Enterprises programs can create employment.

As employment is a function of investment, so rural industrialization, agro-based industry and live stock programs have the largest employment potential for this labor force. Livestock programs are generally labor intensive and make better utilization of labor force. They are practically suitable for weaker sections of the rural community.

Pakistan Bait-ul-Mal provides relief to poor. With the help of this institution in rural areas, schools, vocational centers, *dustcari* (handicrafts) schools for women and training centers may be established.

NGOs and CBOs involved in skill development and adult education with strategies to improve income-generating opportunities may help. The poverty reduction strategies should cover creation of income and employment opportunities.

REFERNCES

ADB (Asian Development Bank) (2000), "Poverty in Pakistan: Issues, Causes and Institutional Responses" Asian Development Bank, Pakistan Resident Mission, Islamabad.

Arif, G.M., H. Nazli and R. Haq (2000), "Rural Non-farm Agricultural Employment and Poverty in Pakistan" *Pakistan Development Review*, 39(4).

Baland, J; and R. Jams (1998), " A Model of Child Labor" Seri Recherche No. 206 CRED, University of Namur, Namur, Belgium.

FBS (Federal Bureau of Statistics) (2001), "Pakistan Integrated Household Survey-Poverty in the 1990s" (Second Draft), Federal Bureau of Statistics, Islamabad.

Gazder, H. (1999), "Poverty in Pakistan: A Review, Traditional Topics and Contemporary Concerns", Karachi: Oxford University Press.

Haq, M; and K. Haq (1998), "Human Development in South Asia 1998" Karachi: Oxford University Press.

Hussain, I. (1999), "Pakistan-The Economy of an Elitist State" Karachi: Oxford University Press.

Kardar, S. (1987), "The Political Economy of Pakistan" Lahore: Progressive Publishers.

Lanjouw, P. (1999), "Rural Non-agricultural Employment and Poverty in Ecuador" *Economic Development and Cultural Change,* 48 (1).

Qureshi, S.K; and G.M. Arif (2001), "Profile of Poverty in Pakistan, 1998-99" MIMAP Technical Report No.2, Pakistan Institute of Development Economics, Islamabad.

Saeed, K. A. (2000), "Economy of Pakistan (2000-2001 Edition)" Lahore: New Fine Printing Press.

Sawada, Y. (1997), "Human Capital Investment in Pakistan, Implications for Micro Evidence from Rural Households" *Pakistan Development Review*, 36(4).

Sawada, Y. and M. Lokshin (2000), "Household Schooling Decisions in Rural Pakistan" Japanese Ministry of Education, The Foundation for Advance Studies on International Development and Matsushita International Foundation, Japan.

SPDC (Sustainable Policy Development Centre) (2001), "Annual Review 2000: Towards Poverty Reduction" Social Policy Development Center, Karachi.

Tahir, P. and S. Fatima (2001), "Social and Economic Development-A Rights Puzzle" *Lahore Journal of Economics*, 6(1).

NEED FOR SUSTAINABLE DEVELOPMENT IN PAKISTAN

Qais Aslam*

ABSTRACT

The growth of industrial sector without regard to environmental considerations held Pakistan back from pursuing the course of sustainable development. This paper analyses the environmental degradation in Pakistan, resulting from production techniques which were neither cleaner nor environment friendly. The paper discusses at length the extent of environmental degradation in the light of environmental economic theory. The paper concludes that the adoption of cleaner production techniques will not only enable the industries to reap the benefits of trade in the wake of 2005 when WTO agreements will be in force, but also promote sustainable development so vital for the health of the future generations.

1. INTRODUCTION

Over the last few years Pakistan's environment has come under grave stress. The terrestrial ecosystem has been greatly damaged and the rate of depletion of the natural resources has reached alarming levels. Deforestation, desertification, soil and land erosion, and water logging pose a serious threat to wide range of animal and plants species. Pakistan has the unenviable distinction of having the second largest rate of deforestation in the world. The level of pollution in both the urban and rural areas is horrific.

According to one estimate carried out in 2001, Pakistan generates 47,920 tonnes of solid waste per day out of which 19,190 tonnes is urban waste and 28,730 tonnes is rural waste. To make matters worse, excessive use of pesticides has adversely affected biomass of agricultural land. The entry of huge amount of chemicals into the environment every year and their processing through outdated production techniques create a potential risk not only to the ecosystem but also to public health. The continuing loss of biodiversity and fragmentation of natural habitats has affected agro eco-systems and brought some species on the verge of extinction.

This study looks into environmental challenges confronting Pakistan in the changed and changing international economic and environmental regime in the wake of globalization. It underscores the need to adopt sustainable development strategies and solutions to cope with problems which stem from the introduction of new multilateral trading system regime in the world.

The study unfolds as follows: Section 2 presents the rationale behind sustainable development in the light of environmental economic theory. Section 3

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explains the international pre requisites of sustainable development Section 4 highlights the policy measures which the government should adopt for the promotion of sustainable development in the country. Section 5 underlines the need for the introduction of environment friendly technologies in the industries in the light of new WTO rules and regulations. Section 6 discusses the environmental degradation in Pakistan in recent years. The last section concludes the paper by emphasizing the need for sustainable development to cater to the needs of new trade architecture and fulfill international obligations set out in it.

2. ENVIRONMENTAL ECONOMIC THEORY

The best way to analyze environmental protection through cleaner production techniques is by using the tool of cost-benefit analysis. In this approach environmental costs and economic benefits of production are valued. It also shows the effect of output on environmental degradation and assesses the economic and social benefits from production of that output. This would include costs of cleaning up environment as well as the long-term sustainability of the benefits. If the costs are greater than the benefits, the product is 'not clean' and therefore has to be produced through more environment friendly techniques and technologies. If the product's long-term benefits are more than the costs it is referred as 'clean' product since it contributes to sustainable development.

Fig.1: Cost Benefit Analysis

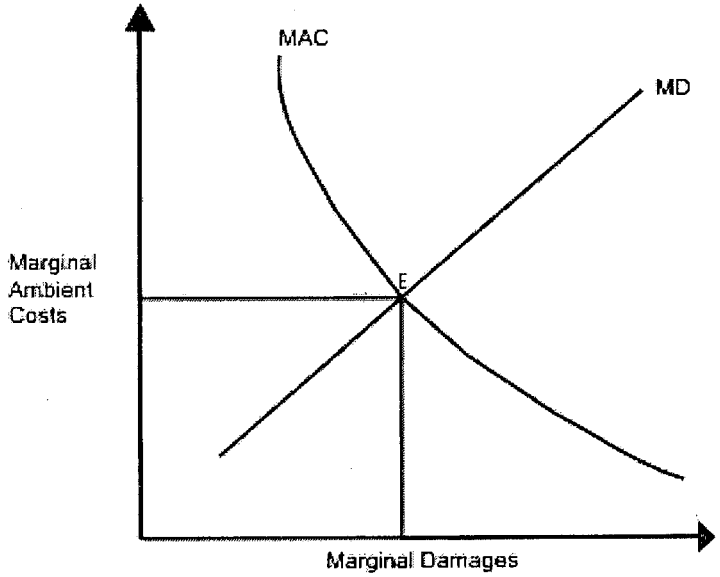
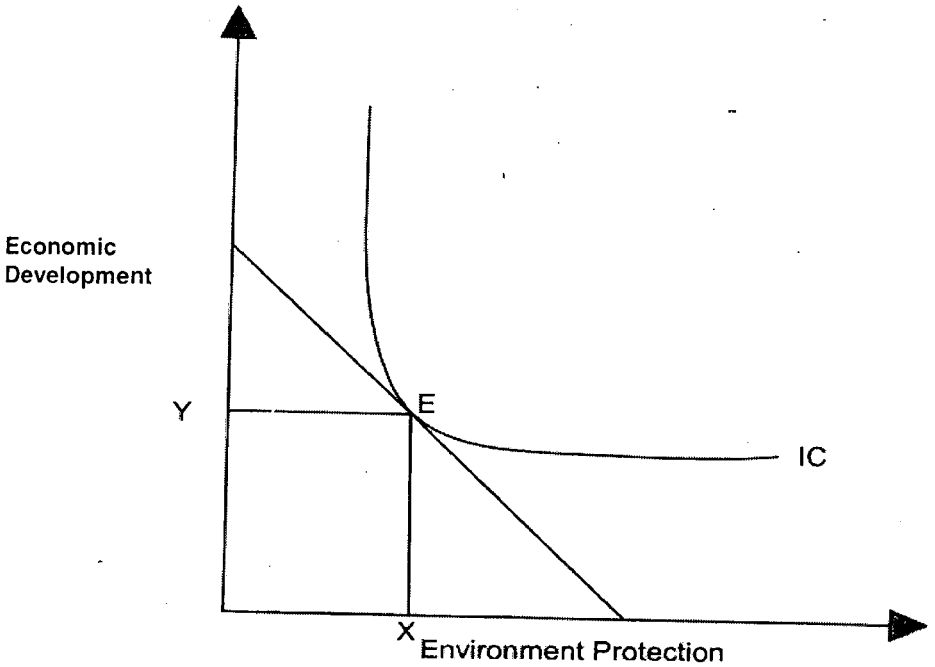


Figure 1 shows the cost benefit analysis of production of cleaner products for sustainable development. The point of interaction between Marginal Damage (MD) to the environment curve and the Marginal Ambient Costs (MAC) Curve is

the cost-effective point where development of and production of a 'clean' product can be achieved with the help of eco-friendly technologies or 'eco-tech' Industry for sustainable development and cleaner environment. This can also be seen with the help of opportunity cost analysis in Figure 2.

Fig.2: Opportunity Cost Analysis



In Figure 2, the point of tangency between the Community Indifference Curve and the Community's budget line is the point where it is cost effective to produce goods that cater for both sustainable economic development and environment protection. At all points above the equilibrium point (tangency point) economic development will be at the cost of cleaner environment, and at all points below the equilibrium point, greater environment protection will be at the cost of economic development and standards of living.

Economic theory can help us understand the characteristics of these economic principles and approaches in the most favorable circumstances for use and assist in the process of designing instruments for maximum effectiveness in producing 'cleaner' products for sustainable development.

3. INTERNATIONAL PREREQUISITES ON SUSTAINABLE DEVELOPMENT

Principle 3 of the United Nations Conference on Environment and Development at Rio 1992 states, "The right to development must be fulfilled so as to equitably meet developmental and environmental needs of the present and

the future generations". This would in economic terms mean 'Intra-generational equity' or in more general term 'Sustainable development'. Sustainable development means that the present generation should undertake such economic activity that not only ensures a 'relatively' decent standard of living for the present generation, but for the future generations as well.

Sustainable development through 'Cleaner Products' means economic development for the sake of progress, for the sake of standard of living, for the sake of satisfying the needs of our community and our market – both at national and global levels. But this economic development has to be environment friendly and not at the cost of health of our children.

The first law of thermodynamics is that the waste generated as a result of the cumulative production and consumption must be present somewhere in the physical system of our natural and social environment. The capacity of that system to absorb waste must therefore be taken into account when planning any economic activity, especially production of goods and services, both for consumption as well as production purposes.

Another question is the limit to economic growth. Studies show that the earth's mineral resources are running out quickly. Therefore it is necessary to plan economic activity in a manner that it preserves resources of this earth which can be used for productive, and consumption needs of this generation without compromising needs of the future generations. There is an array of substitute technology development that helps preserve energy resources as well as raw materials and also recycle waste in such a way that can be reused both as energy sources as well as raw material for the same or another related industry.

Of the terawatts of energy used on earth, the per capita consumption is 2.1 kilowatts. Pakistan's consumption is 500-600 watts per capita. Oil and gas put together cater to the needs of two thirds of the country's population. The rest is met by firewood and biomass. Coupled with this, our energy use is characterized by high degree of waste and inefficiency. Since the bulk of the energy consumed comes from oil, it has adverse effects of environment.

Renewable energy sources and methods of energy conservation can play an important role in addressing the challenges and environmental concerns and in facilitating the sustainable development agenda for a better and secure future. These energy sources promote clean environment, create job opportunities for the people, and enhance the living standards besides protecting the environment. Energy conservation and renewable energy sources are praised and promoted the world over these days. Wind, sunlight, and biomass are some of the examples of renewable energy resources.

The United Nations Conference on the Human Environment at Stockholm 1972 declared, "Man is both creature and molder of his environment, which gives him physical substance and affords him opportunity for intellectual, moral, social and spiritual growth. In the long and tortuous evolution of the human race on this

planet a stage has been reached when, through the rapid acceleration of science and technology, man has acquired the power to transform his environment in countless ways and on an unfrequented scale. Both aspects of man's environment, the natural and the man-made are essential to his wellbeing and to the enjoyment of basic human rights — even the right to life itself".[2]

In the recently concluded World Summit on Sustainable Development, biogas has boon identified as a very important source of energy for the rural communities. Pakistan council for Research into Renewable Technologies has set up biogas plants in various cities to promote this renewable energy source. Energy conservation and renewable energy sources offer alternative means to ensure equitable access to energy to the people irrespective of their income levels and should go long way toward promotion of sustainable development.

4. POLICY MEASURES FOR SUSTAINABLE DEVELOPMENT

At the policy and legislative levels, each government has at its disposal policy instruments for control of environmental externalities. These instruments should include economic and regulatory instruments like redefining of property rights; tax/charge system for controlling pollution; subsidies for changing to environment friendly technologies and techniques; as well as deposit / refund system for industries that might produce environment friendly or environment non-friendly products. On the regulatory side strict environmental quality standard; resource use quotas; and enforcement with penalties under the 'polluter pay' principle and principle of 'pollution prevention' should be introduced.

Economic Instruments	
1. Redefining property rights	Tradable Emission Permits: Liability insurance legislation
2. Tax / charge system	Effluent charges, User charges, Product charges and Administrative charges
3. Subsidies	Financial aid in installing new technologies Subsidies to environmental Research and Development (R & D) expenditure
4. Deposit-Refund System	Combines charges, and Subsidies so as to provide incentives to return pollutants for recycling
Regulations	
5. Standards	Effluent Ambient, and Technology standards
6. Resource use quotas	Emission quotas, Harvesting quotas, By allowing quotas to be traded among market agents The quota system would be transformed to system of traded permits

2 See the Declaration of the United Nations Conference on Human Environment, Stockholm (1972).

These instruments can be broadly classified into direct regulations, also known as 'command and control' strategies; and economic instruments, which make use of the market mechanism and price incentives. The most common form is setting of fixed standards, which may be framed in terms of effluent emissions, ambient concentrations or technological specifications. Standard setting also requires the establishment of a monitoring agency, which has the power to impose penalties for non-adherence.

International Organization for Standardization (ISO) started in 1993 to develop international standards on environment management called ISO 14000, are similar to its widely accepted ISO 9000 quality management standards. The objective of ISO 14000 is to improve environment performance of organizations and to harmonize different national environment management standards in order to facilitate international trade. An increasing number of eco-labelling schemes and standards on environmental management have been developed in several countries. ISO 14000 comprises standards on eco-labeling and life-cycle-assessments focusing primarily on a company's products as well as standards on environment management systems, performance evaluation and auditing which focuses on its management system.

The adoption and execution of a range of environmental management practices and methods per se can guarantee the optimal outcomes for industries. In order to achieve the objectives of sustainable development, the environmental management systems should encourage organizations and industries to take into account and employ technologically viable and economically feasible methods of production.

5. WTO, GLOBALIZATION AND PAKISTAN

Many economists now propound the idea that the natural capital has to be valued. Kenneth Arrow and Larry Goulder emphasize the need to account for ecosystem services. On the other hand ecologists also reconcile that prohibiting everything in the name of protecting nature is not useful either. Experts from both the groups call for striking the right balance between the two strategies. Growth need not be enemy of greenery, but the two forces could be attuned for the greater cause of sustainable development

Today our industry has not only to produce for the internal market; but also for the international market in order to survive in a highly competitive economic environment. It is interesting to note WTO regime not only espouses the cause of free trade without restrictions and governmental controls, it also calls for protection of natural resources for sustainable development. The general exceptions in this regard are among other things, trade and economic activity which affects "human, animal, plant life and health; natural resource conservation, national treasures, etc". [3]

[3] See the GATT based Framework for International Trade (1994)

Our industry is not fully geared to compete and catch up with developed countries of the world. The industrial sector driven by the prime motive of higher profits is operating without caring for environmental considerations at all. The policies adopted by the government in the past were not compatible with sustainable development and have led to growing environmental problems.

According to a study carried out by World Bank in 1992-93 and later updated in 1997, the environmental cost to Pakistan economy in six major sectors of the economy was estimated at US $ 1.8 billion. The cost to economy in terms of urban air pollution was estimated US $ 369 million per year. This cost will be magnified if the government, industry and other stakeholders involved in the overall development process don't take into account the international trend towards sustainability and new patterns of regional and global cooperation. Pakistan being a signatory to a number of international conventions and protocols on environment has to green its industrial sector to get to grips with the challenges of globalization.

In order to compete more efficiently at home and abroad, the industry in Pakistan has to adopt environment friendly technologies and techniques, equip itself with the standards to achieve and demonstrate sound environmental performance and control the impact of development activities on environment by taking into account environmental policy and objectives. This not only means bringing in new technologies for better products, this also means bringing in technologies for 'cleaner' products. Products that use fewer raw materials, less energy, give out less waste after consumption, and which can be (in one way or another) re-used or re-cycled into other products.

The recent phenomena of globalization has not only affected Pakistan but has affected the structure of societies throughout the world. It has redefined the traditional roles and responsibilities of the governments, and business community. The government alone cannot commit itself to deliver the goods on cutting green house gases. It has to work in tandem with the corporate sector to achieve this aim. It is important for Pakistan to restructure its industrial sector and make it adopt international standards on environment to fully reap the benefits emanating from the free trade.

Environment Impact Assessment has been made mandatory for all new industries in order to judge and foresee any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services. It is intended by the Government of Pakistan that the environment management system provides "a structured process for the achievement of continual improvement" of the environment. [4]

Bringing industrial pollution levels to the limits specified in the National Environmental Quality Standards (NEQS) have become all the important for the country since after 2003 the whole international trade regime will undergo

4 See the Pakistan Environment Protection Act (1997).

dramatic change of form and structure in accordance with the WTO agreements. These NEQS were designed by the government of Pakistan in accordance with the ISO 14000 standards. It has also laid down guidelines to design environmental management systems for cleaner products.

Initially NEQS were not well received by the industrial sector. Due to lack of awareness, resources and non-availability of indigenous technology, the industrial sector has failed to address the environmental concerns. The government of Pakistan as part of its policy has initiated a dialogue with the industries responsible for environmental degradation with the view to enable and equip them with the tools and techniques to adopt the specification standards to better compete in international market. Time has come to implement international quality standards as laid down both by ISO 14000 and the Pakistan Government for cleaner products which can sustain development as well as protect our physical and social environment for this and the future generation.

For environmental protection, the government should introduce risk management programs based on accurate and up-to-date emission inventories, screening assessments and identification of safer chemicals. Also strategic approaches and implementation programmers, which take into account the different needs of individual industries, will have to be adopted. Action to stop industries and firms from producing, promoting, and trading in dangerous chemicals should be taken. The industry and households should be encouraged to use non-toxic cleaner products. There has to be stringent enforcement of ban on the use of chemicals, which have harmful effects on the natural and living environment. There has to be a greater use of 'precautionary principles' and 'polluter pays' principle in checking, controlling and managing pollution to the environment from the industry. Proactive efforts by the manufacturers and users of all hazardous materials should be adopted, disrupting substances to phase out their use and production, so that more environment friendly products can replace them. Safe waste disposal techniques and works should be introduced by the industry to eradicate hazardous to human health materials and environment pollutants.

6. ENVIRONMENTAL DEGRADATION IN PAKISTAN

The total land area in Pakistan is 88.2 million hectares. Less than 5% of the total area is under forests. There are approximately 51.3 million hectares of rangelands in the country. It is estimated that 40 thousand hectares of land is destroyed annually due to water logging and salinity.[5]

The rate of urbanization in the country is 5%. The urban population in 1989 was 28%, which has gone up to 50% in 1999. Due to this accelerated pace of urbanization, prime agricultural land is being eaten away by city dwellers. In Pakistan per capita urban absorption costs are typically 4 to 6 times of the rural retention costs. Currently, one fourth of Pakistan's urban population resides in

5 See IUCN Factsheet on Land (1989)

unserviced squatter settlements. [6] According to the National Human settlements Policy Study the share of squatter settlements could exceed 60% in 2003.

Pakistan has abundant fresh water resources from surface water of the five rivers and their tributaries, local rainfall, ground water and glaciers. In 1998 total fresh water resources in the country were approximately 2,000 cubic meters per capita. While annual fresh water withdrawal was 155.6 billion cubic meters, which is 61 %of total resources. With the development of cheap hydroelectric power, the use of traditional water systems has been neglected resulting in a rise in water levels.

Evaporation results in salinity and water logging. 60% of total Cultivable Command Area was waterlogged and another 24% area had salinity in 1985. Due to the inadequacy of the water supply, sewage is carried by surface flow into open drains, which ultimately discharge into streams and rivers. River Ravi around city of Lahore has a sewage dilution of a ratio of 1:1 and the river is now merely a sewage carrier, devoid of any marine life.

Apart from municipal waste, river water also carries pollution from industrial waste. Virtually every type of pollution is found on the coasts of Pakistan. The greatest threat to marine life and environment is from oil pollution and oil spills from the Persian Gulf region. Rate of siltation in the Tarbela Reservoir is 168 million cubic meters per annum and in Mangla Reservoir is 48 million cubic meters per annum. In 1996 only 52 %of the rural population and 77 %of the urban population had access to improved water resources in the country. [7]

Less than 5% of the total area is under forests. The deforestation rate has been estimated at 0.2% to 0.5% per annum. Pakistan's woody biomass is declining at a rate of 4-6% per year. The main causes of deforestation are mounting population pressure, dependence of urban and rural households on fuelwood, suspension of forest management in natural forests, unscientific grazing beyond carrying capacity, smuggling of wood by timber mafia floods, fires and storms, and inadequate financial inputs. Nearly 50% of the beating and cooking requirements are met by 20.88 cubic meters of fuel wood consumed every year, as the cheaper fuel source – natural gas – is accessible to the affluent, rather than the poor.

Air pollution is another big problem. Statistics show that in 1997 there was approximately 57 million metric tons of commercial energy (oil equivalent) use in Pakistan which amounts to 442 kg of oil equivalent in per capita terms. The carbon dioxide emissions in 1996 were a total of 94.3 million metric tons, which were 0.8 % per capita metric tons.[8]. For practical purposes there are no controls of waste emissions by industry in Pakistan. The material that the industry spews into the air, discharges into the water sources, or dumps on the ground is

6 See the Statistical Appendix of Economic Survey of Pakistan 1999-2000.
7 See IUCN Factsheet on Water
8 See the Pakistan Standard Specification for Environmental Management Systems (2000).

frequently toxic. This discharge poisons rivers and land, killing fish, affecting human health, and rendering waste cultivable area through pollution.

This unplanned, uncontrolled, and unsustainable economic activity degrades the environment and increases the risk of poverty in the country. This situation carries the message whereby Pakistan is called upon to adopt sustainable development policies and implementing sustainable development solutions to stem the time of environmental degradation.

7. CONCLUSIONS

Looking at the state of the environmental degradation in Pakistan, it can be said that Pakistan still has a long way to go to reach the equilibrium in the light of environmental economic theory. The wastewater production levels suggest that production techniques currently in use are neither clean nor environment friendly. A survey carried out for 150 industrial units in five potentially toxic groups revealed that these units are producing pollution levels far beyond those prescribed in the National Environmental Quality Standards. The tanneries located in Kasur and Sialkot are discharging effluents with chrome concentration ranging between 182-222 mg/litre against the standards of 1 mg/litre prescribed in NEQS.

Pakistan's industrial sector grew and developed without giving much consideration to environmental issues and considerations. It evolved before the enactment of basic national environmental legislation and strong pollution controls. The laws promulgated so far like Environmental Protection Ordinance approved in 1997 require further improvements. The high quality environment protection standards should be designed in the light local conditions and reflect the consensus opinion of the industry before its application at the national level. Accordingly, environmental degradation due to uncontrolled and inefficient use of natural resources, low industrial productivity, excessive generation of hazardous industrial and solid waste, air pollutants and untreated waste water into natural environment has become a major problem in Pakistan. The ecological damage arising from the environmentally inefficient production techniques is accompanied by considerable economic losses due to use of these production methods. The rate at which environment friendly production techniques are being adopted by the industry is very low.

Despite various attempts the industrial sector remains in the doldrums due to inadequate and insufficient institutional and financial capacity and has failed to achieve ecologically sustainable industrial development. The low level of awareness and understanding of the importance of conservation and ecologically sustainable development, as well as an insufficient level of involvement of all stakeholders like the community and industry in decision making for actions to conserve natural resources and adopt environment-friendly production processes creates a trade off between development and degradation in Pakistan. To make worse there is a wrong perception that sustainable development solutions are not socially equitable and economically viable. As a result of this, costs to the

environment exceeds the benefits to the industry and economy, as people are not putting cleaner production methods to improve the environmental performance of industry.

According to the environmental economic theory the introduction of cleaner production processes and technologies can make a major contribution toward reducing risks to people and the environment. This calls for a shift in thinking from end-of-pipe treatment to pollution prevention. The introduction and implementation of cleaner production techniques which include good operating practices, recycling, reuse and purchase of environment friendly inputs and outputs helps create development patterns without environmental degradation.

The government of Pakistan has started National Cleaner Production Program to help the industries and tanneries to tackle environmental issues. The "multi-sectoral" program will build the capacity of the industrial sector to adopt cleaner production methods by providing policy advice on environmental management, supporting demonstrations of cleaner production techniques/technologies, and highlight the benefits accruing from training industry and professionals in industrial environmental management thus obtaining the point of tangency where there will be no trade off between economic development and environmental degradation outlined in our environmental economic theory.

The start of cross-sectoral National Cleaner Production Program should go a long way toward raising awareness, in-plant demonstrations for initial environmental auditing and development of no-cost and low-cost measures, training, information dissemination and policy assessment and last but not the least the environmental reporting to put a constant check on the industries to remain environment freindly. These activities are interrelated and interlinked with each other. What is significant is that the industries have also started realizing that cleaner products, it will not be possible for them to catch up with the international competitors after 2005 due to new trade regime, rules and regulations.

The potential to improve significantly the environment of Pakistan's large cities which are experiencing severe environmental degradation as a result of population growth, associated increase in urban traffic, and emissions from the industry rests on the governmental commitment to keep persuading the industrial sector that the adoption of cleaner products will go to their benefits as this will equip them to cope with new challenges of globalization. Sustainable development is no longer a luxury. It is the essence of the solution to Pakistan's most pressing environmental problems, realizing the need for economic, social as well as environmental conservation. It will be a win win win situation for the industry, people and government.

REFERENCES

Aslam, Q; (1992), "Population Growth and Pakistan's Economic Problems", *Government College Economic Journal,* XXV (1&2)

Aslam, Q; (1998), "Socio-Economic & Environmental Problems in Pakistan: Past Present and Future", *The Journal of Political Science* XXI (1&2)

Aslam, Q; and B. Naseem, (2000), "Poverty and Environment - A Critical Appraisal", *The Journal of Political Science, XXII (1&2).*

Government of Pakistan (2000), "Pakistan Standard Specifications for Environment Management System, Government of Pakistan, Islamabad.

IUCN (International Union for Conservation of Nature) (1989), "Fact Sheet on Land", Karachi, Pakistan.

---------- (1989), " Fact Sheet on Water" Karachi, Pakistan.

---------- (1989), "Fact Sheet on Land" Karachi, Pakistan.

Ministry of Finance, "Economic Survey of Pakistan" [Various Issues].

Munir, M. A, N. Ahmad and S. Cheema, (2000), "From GATT to WTO: A Legal Analysis", *Pakistan Company & Tax Law Reports* Lahore.

The Ministry of Environment, (1997), "Pakistan Environment Protection Act, 1997", The Gazette of Pakistan, Islamabad.

The World Bank, (2000), *"World Development Report"* [Various Issues], The World Bank, 2721, Washington D.C.

UNDP (United Nations Development Program) (1996), "ISO-14000, Environment Management Standards and Implications for Exporters to Developed Markets", UNDP, New York, USA.

UNO (The United Nations Organizations) (1972), "Declaration of the United Nations Conference on the Human Environment", Stockholm, Sweden.

UNO (The United Nations Organizations) (1992), "The United Nations Conference on Environment and Development, Rio Declaration, Rio De Janeiro, Brazil.

WTO (World Trade Organization) (1994), "WTO Agreement and The GATT based Framework for International Trade" WTO, Geneva, Switzerland.

EMPLOYMENT GENERATION AND LABOUR ALLOCATION IN THE RURAL PUNJAB: A TEMPORAL POLICY REVIEW

Mahboob Ellahi*

ABSTRACT

A number of public policies including, the use of bio-chemical technologies, land reforms and public works programmes have been introduced by the government over the years to expedite the process of economic development, open overseas labour market and promote agro-based industries. This study is an attempt to examine the implications of these policies for rural employment and labour allocation. It analyzes the impact of these policies on job tenure and overtime changes in the employment contribution of various sectors. The bio-chemical technologies increased employment which is concentrated at seasonal peaks and job tenure remained almost unaltered. Overall agricultural growth motivated the development of backward and forward linkages with industries and increased labour employment. However, the share of agriculture in total employment declined from about 65% in 1951 to about 48% in 2000. There was a considerable increase in employment shares of construction, transport and commercial activities, and a slight increase in manufacturing industries showing fluctuations in response to public policies.

1. INTRODUCTION

At the time of independence in 1947, Pakistan's economy depended heavily on agriculture. The government introduced new technologies to achieve a break-through in agricultural production in the early 1960s. This was followed by the establishment of large and small scale industries leading to non-farm employment. The opening of overseas labour market in the 1970s attracted skilled and unskilled labour. These changes influenced the demand for and supply of labour. The main objective of this study is to review technical and institutional changes from the viewpoints of employment generation and how they influence labour allocation. It is based on temporal information and data provided in a variety of published material.

The data on temporal changes are not consistently available for Punjab as all provinces remained as 'One Unit', called West Pakistan, during 1955-70 period [Khan (1997)]. Thus, country level data were used where the same were unavailable for Punjab. Input data are consistently available from 1970-71 and the same are generally used as a reference point.

The study unfolds as follows: A review of development process, comprising bio-chemical, mechanical and hydrological technologies is provided at the outset,

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which is followed by land reform policies. A temporal review of various policies for labour absorption in the domestic and overseas labour markets, along with their implications for employment, labour allocation, wages and occupational change is undertaken in section 4. Section 5 reviews the temporal changes in sectoral shares in total employment. It concludes with the policy implications for rural employment and job tenure in rural Punjab.

2. TECHNOLOGICAL CHANGE

In the beginning, the "Five First" priorities comprising improved seeds, chemical fertilizers, plant protection, tubewells for supplementary irrigation and tractors for expeditious land preparation were introduced [Naqvi et al. (1989)]. To facilitate input financing, credit policies were recommended by the government through the public sector institutions [Government of Pakistan (1960a)]. In addition, policies for subsidizing bio-chemical inputs were introduced along with extension services [Alavi (1983)].

2.1 Bio-Chemical Technologies

The green-revolution started with the introduction of fertilizer-responsive varieties of dwarf Mexican wheat and IRRI rice. In addition, high-yielding and pest-resistant varieties of cotton and other crops were introduced. The data in this respect are provided in table 1.

Table 1
Input Use in the Punjab during Selected Crop Years

Inputs and units of measurement	1970-71	1980-81	1990-91	Growth rate[a] 2000-01	Per annum
i) Improved seed (000 tonnes)	14.8	62.1	55.4	170.8	8.5
ii) Fertilizer (000 nutrient tonnes)	184.3	697.7	1347.7	2068.0	8.4
Plant protection (%age of cropped area covered)	2.2 (2.0)[b]	1.7 (2.9)	18.7 (2.1)	38.6 (2.3)	10.4 -

Source: Agricultural Statistics Of Pakistan (Various Issues)

a) In 2000-01 as compared with 1970-71.

b) Number of times plant protection was applied.

The use of improved seed and chemical fertilizer increased at average annual rates of about 8.5% each. The plant protection coverage progressed from 2.2% in 1970-71 to 38.6% in 2000-01. This shows an impressive increase of more than 10.4% per annum compound.

The bio-chemical technologies were mainly production-oriented but they created rural employment. This was true for planting, weeding, harvesting, threshing and marketing of the output. For some operations, wages are output-

related and have implications for real wages. Precise estimates of the increased employment are not available. However, the technologies were scale neutral, consistent with small farming and labour intensive crops [Johnston and Cownie (1969), Khan (1978), Chaudhry (1981 and 1982) and Naqvi et al. (1989)].

The increased employment remained concentrated at the seasonal peaks for various crops with varying effects for landless and landed households. For example, the former are expected to supply more labour for farm jobs on account of their attachment to land and latter may behave differently. High seasonal wages can motivate a temporary turn off from tenure jobs (with indefinite duration). On the other hand, if the cost of returning to tenure jobs is greater than net gains from temporary farm jobs, the tenure workers may forego high seasonal wages. Hence, bio-chemical technologies may not have a noticeable impact on tenure status of farm jobs.

2.2 Irrigation Technology

Irrigation water, at the farm-gate, increased from about 64 million acre feet (MAF) in 1965-66 to about 135 MAF in 2000-01 (Agricultural Statistics of Pakistan 1978 and 2000-01). The share of tubewell water increased from about 14% in 1965-66 to about 38% in 2000-01. In total, tubewell water increased about seven times. This facilitated change in cropping patterns, involving labour intensive crops, such as rice, cotton, sugarcane, orchards and vegetables. There are two implications of irrigation development for employment and labour allocation. First, increased demand for unskilled labour [Ellahi (1984)] and secondly skilled labour is required as tubewell mechanics.

2.3 Tractor Technology

The mechanical tractor power complements irrigation in adjusting to new crop rotations and higher cropping intensities. The Pakistan Census of Agricultural Machinery 1984 and 1994 reported 129,000 tractors in the Punjab during 1983-84 and 210,000 in 1993-94 showing an increase of 5% per annum compound [Government of Pakistan (1987 and 1995)].

The employment implications have been debated at length, in the empirical literature, putting forward either of the two arguments, i.e. increased demand for labour due to higher cropping intensities, or labour displacement from selected crop operations. Biswanger (1978) showed that tractor's impact on cropping intensities was negligible, a result supported by Cownie et al. (1970). Khan (1975) reported a displacement of about 0.2 million workers during 1972-73 in the Punjab, which was about 2% of rural labour. Khan (1978) and ILO (1983) observed that tractor was necessary to increase cropping intensities, but it displaced labour. Ahmad (1981 and 1983) reported that labour input per acre on mechanized farms was 18% less than that on bullock farms, while Bose and Clark (1969) and McInerny and Donaldson (1975) observed this effect as about 50 and 40% respectively. Gotsch (1973) showed that tubewell-tractor technology

led to an 18% increase in labour input, while Chaudhry (1986) concluded that there is a net increase of 4% in agricultural employment.

Tractor technology is scale non-neutral, but the conventional hire market for rental services makes it otherwise [Chaudhry et al. (1985)]. It is used for critical crop operations to overcome seasonal labour shortages. Farmers may prefer self cultivation with one family member, while others may take non-farm work. Also they may turn off permanent labour and employ casual labour during peak seasons.

2.4 Overall Impact of New Technologies

These impacts were analyzed by Khan (1978), Chaudhry (1981), Ellahi and Azim (1987) and Irfan (1988). Khan (1978) studied crop sub-sector for small farms (5 to 12.5 acres) in the Punjab, while Chaudhry (1981) focused on Pakistan. The analyses carried out by Ellahi and Azim (1987) and Irfan (1988) covered total agricultural sector of the country.

Additional employment of 0.22 million man years was generated in 1972 as compared to 1960, which was about 2.2% of the Punjab's rural labour force in 1972 [Khan (1978)]. Of this, tenure jobs were 0.1 million man years. Farm jobs in Pakistan's crop sub-sector during 1962-63 to 1977-78 increased by 2.6% per annum [Chaudhry (1981)]. The share of cropped area cropping pattern and new technologies were about 56, 28 and 22% respectively.

The average growth rate for hired labour from 1961-73 was about 4% per annum [Ellahi and Azim (1987)]. However, total agricultural employment grew at about 2% per annum. This compared very well with the same 1961-73 and 1973-81 periods which were 2.3 and 1.8% per annum, respectively [Irfan (1988)].

The Agriculture Censuses of 1972, 1980, 1990 and 2000 also provide an insight into the growth of tenure and non-tenure jobs in Punjab. The use of permanent labour declined from 0.35 million man years in 1972 to 0.30 million man years in 1980, showing a fall of 1.91% per annum. This, however, increased to 0.32 and 0.36 million man years in 1990 and 2000 respectively. This showed a growth rate of 0.65% per annum in 1990 compared to 1980 and 1.18% per annum in 2000 over the preceding census year. The use of family labour increased from 8.69 million man years in 1972 to 11.10 million man years in 1980, exhibiting a growth of 3.12% per annum. It declined to 10.32 million man years in 1990 at the rate of 0.73% per annum off-setting the increase in permanent labour. This, however, increased to 12.90 million man years in 2000 showing a growth of 2.26% per annum over 1990. Farms using casual labour increased from 34% in 1972 to 54% in 1980 and 58% in 1990, while in 2000 these declined to 44%.

The drastic variation in the composition of employed farm labour in the Census of 2000 as compared with earlier ones needs an in-depth study. During discussion with a senior officer of the Agricultural Census Organization, it was

revealed that there are two possible causes of the change observed, i.e. crop specialization and introduction of capital intensive and cost effective machinery, notably combine harvesters for wheat and paddy crops. These developments are an outcome of techno-economic adjustments rapidly taking place in the agrarian economy and call for policy measures to create alternatives for labour employment.

3. LAND REFORMS

Land reforms introduced in four different periods, had implications for labour use. In 1949, the Agrarian Committee of Pakistan Muslim League conferred limited rights to share-cropping tenants in Punjab, Sindh and North Western Frontier Provinces [Government of Pakistan (1957)]. Land reforms introduced in 1959 by the martial law regime, fixed ceiling on land ownership at 500 acres of irrigated or 1000 acres of unirrigated land with exemptions for mechanization livestock and orchards. In March 1972, land reforms fixed the maximum ceiling at 150 acres of irrigated land or 300 acres of unirrigated land with exemptions for farm machinery. The last attempt was the Land Reform Act of 1977 which remained an act only due to change of Government.

The objective was to increase production through redistribution of land and security of tenure, but land reforms did not succeed in significantly changing the status quo [Naqvi et al. (1987)]. Rather, it increased eviction [Nabi et al. (1986)]. After the land reforms of 1972, land owners invested in farm machinery to retain land for self cultivation and eviction of tenants, who became agricultural labourers.

4. EMPLOYMENT POLICIES

4.1 The Overseas Market

Attracted by very high wages, the skilled artisans, poor farmers and unskilled labourers moved overseas. The Gulf States accounted for about 90% of the total outflow of migrants from Pakistan during the 1970s [Pervaiz (1979)].

About 1.5 million Pakistanis were reported to be abroad in the late 1970s [Rashid (1983)]. About 43% of them belonged to Punjab of which 79% were from the rural areas. About 41% and 43% of Pakistanis employed in the Middle-East countries in 1979 were skilled and unskilled workers, respectively [Gilani et al. (1981)]. A total of about 1.71 million out-migrants from Pakistan were employed overseas in 1981 [Sarmad (1985)]. An exodus of labour had implications for labour supply and wages in rural areas [Sarmad (1985)]. The required labour is not available for peak season operations [Haider and Kuhnen (1974), Chaudhry (1982 and 1986)] so real wages went up in rural areas [Chaudhry (1982)].

4.2 Works Programmes

The works programmes were meant for community development and labour employment during slack seasons in crop farming [Qureshi and Ghani (1989)]. The activities consisted of developing infrastructures for health, sanitation,

schooling, veterinary care, drinking water, agricultural marketing, rural roads and electrification of villages. The small-scale cottage industries were accorded a high priority to employ landless labour and non-tenure workers.

The Village Agricultural and Industrial Development (Village AID) was initiated in the First Five-Year Plan 1955-60 to cover about 25% of rural population [Government of Pakistan (1957)], which increased to 85% in the Second Five-Year Plan 1960-65 [Government of Pakistan (1960b)]. It was replaced with Rural Works Programme in 1963-64 with more enthusiasm in the Third Five-Year Plan 1965-70 [Government of Pakistan (1965)]. The Rural Works Programme was replaced with the Peoples Works and Integrated Rural Development Programmes in 1972. However, the achievement remained below envisaged targets [Government of Pakistan (1978)].

The concept of works programmes disappeared from the Fifth (1978-83) and Sixth (1983-88) Five-Year Plan documents [Government of Pakistan (1978 and 1984b)]. However, special emphasis was given to rural development and rural transformation by providing a package of inputs and services, generally included in the previous works programmes. In addition, small-scale industries were encouraged by providing necessary credit facilities for fixed and working capital, especially for technical people, such as doctors, engineers and small businesses for self-employment.

Due to paucity of data, it is difficult to assess employment effects of the works programmes. It was estimated to provide 85,000 man years of direct and 315,000 man years of indirect employment during 1969-70, which was 2.25% of the total labour force [Government of Pakistan (1965)]. However, the envisaged employment targets could not be achieved due to reduction in resources actually used. According to ILO (1977), these programmes generated 62,000 million man years of employment, i.e. about 0.4% of the total labour, during 1963-64 to 1965-66. The Peoples Works Programme, during 1972-73, employed 35,000 skilled and unskilled persons in Punjab (0.35% of labour force) [Government of Pakistan (1973)]. All this implies that the Rural and Peoples Works Programmes did not have a noticeable impact on rural employment [Qureshi and Ghani (1989)].

4.3 Agro-Based Industries and Non-Farm Employment

The major agro-based industries include wheat milling, cotton ginning, spinning and textile processing, sugar manufacturing and processing of rice and oilseeds. Other industries include sports goods, hard-board manufacturing, milk processing, leather handling and manufacturing footwear, carpet and velvet making. Chemical fertilizers, processing seed and fabricating farm machinery and related equipment provided tenure employment to many skilled and unskilled workers. Their total employees were about 0.39 million during 1983-84 (about 2% of rural labour in the country) [Qureshi and Malik (1991)]. About 75% of these were unpaid family helpers. These industries help in bridging employment gaps between seasonal peaks as they function after crop harvest reaches them.

Non-farm employment includes a wide range of activities, including self-employment, white-collar jobs in regular services, personal businesses, skilled works, etc. In addition, construction work in the metropolitan areas provides non-farm jobs. This sector absorbs rural workers during slack seasons in rural economy [Muqtada (1991)]. Non-farm employment registered an average annual growth rate of 4.5% during 1951-61 period [Bose (1963)], which was 2.7 and 5.2% per annum during 1961-73 and 1973-81 periods, respectively [Irfan (1988)].

4.4 Occupational Change

The technical changes, institutional reforms, works programmes and development of agro-based industries had varying implications for structure of employment and relationships between landed and landless households. Further, the penetration of market economy and creation of non-farm jobs led the rural community to undergo occupational change.

Khan (1978) reported that landless households having technical skills, either migrated to towns and took up industrial jobs or produced marketable goods. Eckert (1972), Haider (1977) and Ellahi (1984) indicated that village artisans were shifting away from traditional work system to wage or profit earning jobs. Hirashima (1977) in this respect stated:

> 'Although there has been a gradual transformation of the *kamees* from traditional to non-traditional or more precisely, the extension of tradition based occupations, only recently has the occupational mobility of the *kamees* become visible because of the development of the non-agricultural sectors and spread of education.'

The process of occupational change applied to landed community as well. For instance, small farmers and tenants became agricultural labourers as a result of structural change [Khan (1978), Rouse (1983), Nabi et al. (1986) and Zaman (1988)].

5. TEMPORAL CHANGES IN SECTORAL EMPLOYMENT SHARES

Sectoral shares in total employment provide an insight into the interaction among various factors operating and implications of public policies on job creation. The data are derived from the Population Censuses of 1951, 1961, 1981 and 1998, the Housing Economic and Demographic (HED) Survey of 1973 and Labour Force Surveys. The census figures are broad-based whereas Labour Force Survey results are based on data collected from a limited sample. On the other hand, the census is carried out at intervals of ten years or more, while the survey results are available for most of the inter-census years.

The data on sectoral shares in employment for the country (due to paucity of the same for Punjab) are provided in Table-II.

Table 2
Sectoral Contribution of Employment in Pakistan (1951-2000)

Year	Agriculture	Manufacturing and Mining	Construction and Public utilities	Transport	Commerce and trade	Service and unallocated
1951	65.3	9.8	1.8	1.7	6.9	14.5
1961	59.6	13.7	2.3	2.7	7.1	14.7
1972	58.6	9.2	4.6	3.9	12.7	11.0
1981	52.6	9.7	4.8	4.1	10.2	18.6
1985	50.6	13.8	6.3	5.2	11.5	12.6
1990	51.2	12.8	7.0	4.9	11.9	12.2
1995	46.8	10.5	8.0	5.1	14.5	15.1
1998	47.2	10.1	7.0	5.5	13.9	16.3
2000	48.4	11.6	6.5	5.0	13.5	15.0

i) Population Censuses of 1951, 1961, 1981 and 1998;
ii) HED Survey of 1973; and
iii) Labour Force Surveys for 1985, 1990, 1995 and 2000.

It is revealed that the share of agriculture in total employment declined from 65.3% in 1951 to 59.6% in 1961. Due to low agricultural growth the employment contribution of agricultural sector declined further to 47.2% in 1998, while that of manufacturing, construction, transport and services increased which indicates development of non-agricultural sector. In 2000, agriculture and manufacturing showed some improvement, while an opposite of this took place for construction, transport and services sectors.

According to HED Survey of 1973, the share of agriculture showed a marginal decline as compared to 1961. Although the shares of construction and commercial activities increased, industrial manufacturing declined to its minimum level of 9% in 1972 and 1981 due to nationalization of industries in the 1971-77 period. The contribution of agricultural sector declined from 58.6% in 1972 to about 52.6 per cent in 1981. Most sectors retained their shares in total employment during this period but there was an increase in the share of services.

Finally, the share of agricultural sector during 1981-2000 period remained at about 52 to 48% while the share of manufacturing industries varied from 10 to 14%. The activities including, construction, transport and commerce registered increases of varying degrees in their shares during 1990s as compared to 1980s.

6. CONCLUSIONS

The study shows that public policies had implications for rural employment and job tenure. The bio-chemical technologies, being complementary to both land and labour, led to increased employment. However, it is concentrated at the seasonal peaks and tenure status of farm jobs remained almost unaltered. The irrigation technologies led to increased employment and improved the tenure status of farm jobs. The tractor technology had a positive relationship with farm labour, but it led to the eviction of tenants and labour displacement. On the whole, there was an increased demand for casual labour, but a decline for that of

permanent labour. This trend was, however, reversed during 1990s due to increased crop specialization and introduction of capital-intensive technology.

The land reforms led to eviction of tenants, increased self-cultivation and labour displacement, which motivated self-employment. Agricultural labour participated in the domestic non-farm labour market or left for abroad. These activities provided both tenure jobs and higher salaries as compared to farm jobs, which influenced labour allocation and farm wages.

Works programmes were initiated for mass participation of rural labour in economic development, but did not have a noticeable impact on rural employment. However, overall growth in agricultural sector increased potential for the development of backward and forward linkages with industries and increased labour employment.

As a result of various policies and changes taking place in the economy, the share of agriculture in total employment declined from about 65% in 1951 to about 48% in 2000. On the other hand, there has been a considerable increase in employment shares of construction, transport and commercial activities. The employment contribution of manufacturing industries also increased, but it showed considerable fluctuations in response to public policies.

REFERENCES

Ahmad, B. 1981. Implications of Farm Mechanization for Employment, Productivity and Income. Paper presented in a Workshop on Farm Mechanization, University of Agriculture, Faisalabad.

--------- 1983. Labour Utilization Pattern of Major Corps. *Pakistan Manpower Review*, 9(1), 26-46.

Alavi, H. 1983. Elite Farmer Strategy and Regional Disparities in Asian Agricultural Development. The Roots of Dictatorship, Zed Press, London.

Biswanger, H.P. 1978. The Economics of Tractors in South Asia: An Analytical Review. Agricultural Development Council Inc., New York.

Bose, S.R. and E.H. Clark II 1963. Labour Force and Employment in Pakistan 1961-86: A Preliminary Analysis. *The Pakistan Development Review*, 3(3), 371-398.

Bose, S.R. and E.H. Clark II 1969. Some Basic Considerations on Agricultural Mechanization in West Pakistan. *The Pakistan Development Review*, 9(3), 273-308.

Chaudhry, M.G. 1982. Green Revolution and Redistribution of Rural Incomes: Pakistan's Experience. *The Pakistan Development Review*, 25(4), 431-445.

--------- 1986. Mechanization and Agricultural Development in Pakistan. *The Pakistan Development Review,* 25(4), 431-445.

--------- 1981. Rural Employment in Pakistan: Magnitude and Some Relevant Strategies. Research Report Series No. 131, Pakistan Institute of Development Economics, Islamabad.

Chaudhry, M.G., M.A. Gill and G.M. Chaudhry 1985. Size Productivity Relationship in Pakistan Agriculture in the Seventies. *The Pakistan Development Review*, 24(3 and 4), 349-359.

Cownie, J., B.F. Johnston and B. Duff 1970. The Quantitative Impact of the Seed Fertilizer Revolution in West Pakistan: An Exploratory Study. Food Research Institute Studies, 14(1).

Eckert, J.B. 1972. Rural Labour Survey in the Punjab. Planning and Development Department, Lahore.

Ellahi, M. 1984. Employment and Occupational Composition of Landless Labour: An Empirical Evidence from Rural Punjab. *Pakistan Manpower Review*, 10(2), 1-13.

Ellahi, M. and P. Azim 1987. Labour Force Growth and Employment Generation in Agriculture Sector of Pakistan. *Pakistan Manpower Review*, 13(2), 55-68.

Gilani, I., E. Ghani and M. Iqbal 1981. Labour Migration from Pakistan to the Middle East and its Impact on the Domestic Economy. Research Report Series Nos. 126, 127 and 128, Pakistan Institute of Development Economics, Islamabad.

Government of Pakistan 1955. Census of Pakistan 1951. Tables of Economic Characteristics West Pakistan, Vols. 1 and 7, Ministry of Interior, Karachi.

--------- 1957. The First Five Year Plan (1970-75). Planning Commission of Pakistan, Islamabad.

--------- 1960a. Report of Food and Agriculture Commission. Food and Agriculture Commission, Karachi.

--------- 1960b. The Second Five Year Plan 1960-65. Planning Commission of Pakistan, Karachi.

--------- 1962. Population Census of Pakistan 1961. West Pakistan Tables and Reports. Vols. 1 and 3, Home Affairs Division, Karachi.

--------- 1965. The Third Five Year Plan 1965-70. Planning Commission of Pakistan, Islamabad.

--------- 1973. One year of Peoples' Works Programme 1972-73. Ministry of Finance and Planning, Islamabad.

--------- Housing Economic and Demographic Survey 1973. Vol. II, Part I, Statistical Tables Pakistan, Population Census Organization. Interior Division, Islamabad.

--------- 1975. Pakistan Census of Agriculture 1972, Vol. II, Part 2. Province Report Punjab, Agricultural Census Organization. Ministry of Food, Agriculture and Cooperatives, Lahore.

--------- 1978. The Fifth Five Year Plan 1978-83: Sectoral Programmes (Part II), Planning Commission, Islamabad

--------- 1983. Pakistan Census of Agriculture 1980, All Pakistan Report, Agricultural Census Organization. Ministry of Food, Agriculture and Cooperatives, Lahore

--------- 1984a. 1981 Census Report of Pakistan, Census Report No. 69, Population Census Organization. Statistics Division, Islamabad.

--------- 1984b. The Sixth Five Year Plan 1983-88, Planning Commission of Pakistan, Islamabad.

--------- 1987. Pakistan Census of Agricultural Machinery 1984. All Pakistan Report, Statistics Division, Lahore.

--------- 1993. 1990 Census of Agriculture. Vol. I. All Pakistan Report, Agricultural Census Organization, Economic Affairs and Statistics Division, Lahore.

--------- 1995. Pakistan Census of Agricultural Machinery 1994. All Pakistan Report, Statistics Division, Lahore.

--------- 2000. Agriculture Census 2000, Procedure & Data Tables Punjab, Province Report. Vol. II Part 2. Agricultural Census Organization, Statistics Division, Lahore.

-------- 2001. 1998 Census Report of Pakistan, Population Census Organization, Statistics Division, Islamabad.

--------- Agricultural Statistics of Pakistan, Ministry of Food, Agriculture and Livestock, Food and Agriculture Division (Planning Unit), Islamabad (various issues).

--------- Labour Force Survey. Statistics Division. Islamabad (various issues).

Gotsch, C.H. 1973. Tractor Mechanization and Rural Development in Pakistan. *International Labour Review*, 107(1), 133-166.

Haider, A.S. 1977. Emerging Occupations in the Rural Setting: Selective Evidence from Punjab, Pakistan. University of Agriculture, Faisalabad.

Haider, A.S. and P. Kuhnen 1974. Land Tenure and Rural Development in Pakistan, (mimeo).

Hirashima, S. 1977. Zamindars and Kamees in the Punjab - An Economic Analysis of Non-Farm Households in Pakistan Punjab, in Hired Labour in Rural Asia. Institute of Developing Economies, Tokyo.

International Labour Organization (ILO) 1983. Employment and Structural Changes in Pakistan, (Various Issues), Bangkok.

--------- 1977. Problems of Employment Promotion in Pakistan, Geneva.

Irfan, M. 1988. Employment and Wages in Rural Areas of Pakistan (mimeo). Pakistan Institute of Development Economics, Islamabad.

Johnston, B.F. and J. Cownie 1969. The Seed-Fertilizer Revolution and Labour Force Absorption. *The American Economic Review*, 59(4), 569-582.

Khan, D.A. 1978. Employment and Occupational Change in the Rural Punjab: Consequences of Green Revolution. A Paper Presented at the National Conference on Employment Planning and Basic Needs. May 15 to 18. 1978. Pakistan Manpower Institute and ILO, Islamabad.

Khan, M.J. 1975. Economics of Farm Mechanization and Water Development Policies in Pakistan: A Case Study, Ph.D. Thesis submitted to the Colorado State University, Fort Collins.

Khan R. 1997. Pakistan-- A Dream Gone Sour. Oxford University Press, Karachi.

McInerny, J.P. and G.F. Donaldson 1975. The Consequences of Farm Tractors in Pakistan, World Bank Staff Working Paper No. 210. The World Bank, Washington D.C.

Muqtada, M. 1991. Policies and Measures Towards Rural Employment Generation in Asia, in Measures for Rural Employment Generation. Report of Agricultural Productivity Organization (APO) Symposium. September 5 to 12, 1989, Tokyo.

Nabi, I., N. Hamid, and S. Zahid 1986. The Agrarian Economy of Pakistan: Issues and Policies. Oxford University Press, Karachi.

Naqvi, S.N.H., M.H. Khan and M.G. Chaudhry 1987. Land Reforms in Pakistan: A Historical Perspective. Pakistan Institute of Development Economics, Islamabad.

Naqvi, S.N.H., M.H. Khan and M.G. Chaudhry 1989. Structural Change in Pakistan's Agriculture. Pakistan Institute of Development Economics, Islamabad.

Pervaiz, S. 1979. Home Remittances. *Pakistan and the Gulf Economist*, 19(35), 13-32.

Qureshi, S.K. and E. Ghani 1989. Employment Generation in Rural Pakistan with a Special Focus on Rural Industrialization: A Preliminary Analysis. *The Pakistan Development Review*, 28(4), 587-599.

Qureshi, S.K. and M.H. Malik 1991. Measures for Rural Employment Generation: A Case Study of Pakistan, in Measures for Rural Employment Generation, Report of Agricultural Productivity Organization (APO) Symposium, September 5 to 12, 1989, Tokyo.

Rashid J. 1983. The Political Economy of Manpower Export in Pakistan. The Roots of Dictatorship, Zed Press, London.

Rouse, S.J. 1983. Systemic Injustices and Inequalities: Malaiki and Raiya in a Punjab Village in Pakistan. The Roots of Dictatorship, Zed Press, London.

Sarmad, K. 1985. Pakistani Migration to the Middle East Countries, Studies in Population, Labour Force and Migration Project Report No. 8. Pakistan Institute of Development Economics, Islamabad.

Zaman, A. 1988. Rural Employment Strategies and Policies in Pakistan. *Pakistan Manpower Review*, 14(1), 11-57.

A NONPARAMETRIC ANALYSIS OF TECHNICAL OUTPUT EFFICIENCY FOR IRRIGATED AGRICULTURE IN PUNJAB (PAKISTAN)

Haq Nawaz Shah*

ABSTRACT

In this paper a nonparametric analysis of technical and scale efficiencies has been conducted on input-output data of a sample of 387 irrigated farms from the province of Punjab, Pakistan. The results indicate that, on average, 39.59% of potential output was lost due to overall inefficiency, 30.18% due to pure technical inefficiency, and 7.33% due to scale inefficiency. Scale efficiency was significantly and positively associated with farm size, educational level of farmers and their access to credit. Large farmers in Punjab, who have all these characteristics, are technically more efficient than small farmers. The study does not find a support for land reforms because modern inputs have increased the required size of farms for efficient operation.

1. INTRODUCTION

The study of efficiency in production has been the focus of economists since 1951 when the first study on measurement of efficiency in production was undertaken by Debreu. Inefficiency in production has costs in the sense of excessive use of inputs to produce a given level of output. Efforts have been made to identify factors that influence inefficiency. This study uses a nonparametric approach to measure the efficiency of a sample of farms from the Punjab. It examines socio-economic and institutional factors for explaining sources of inefficiency in Punjab agriculture.

Battese *et al* (1993) estimated technical efficiency of a sample of 330 Pakistani farmers from four districts (Faisalabad, Attock, Badin and Dir) using a Cobb-Douglas stochastic frontier production function for wheat using panel data for the period 1986-1991. They found the existence of inefficiencies in three out of four districts and emphasized the need for promoting extension services to familiarize farmers with new technologies. Ghosh (1986) examined the relationship between farm size and productivity and found that, in the post-Green-Revolution period, greater access of large farmers to modern agricultural inputs and credit and extension had more than offset the productivity gains of small farmers over large farmers. Panda (1986) observed that farmers situated towards the head of a canal used more than optimal amount of irrigation water and, therefore, had lower yields per acre than farmers situated along the middle length of the canal. This study examines the efficiency issue in the post-Green revolution period in the Punjab province of Pakistan.

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2. DIFFERENT MEASURES OF EFFICIENCY

Total efficiency of a production unit is called economic efficiency. It has two components: a price dependent component called allocative efficiency and a price independent component called technical efficiency. This study focuses on the technical aspects only. Banker *et al* (1984) state, "technical inefficiencies are identified with failure to achieve the best possible output levels and/or usage of excessive amounts of inputs." The concept of measuring output efficiency is illustrated in Figure 1 using a one input and one output technology.

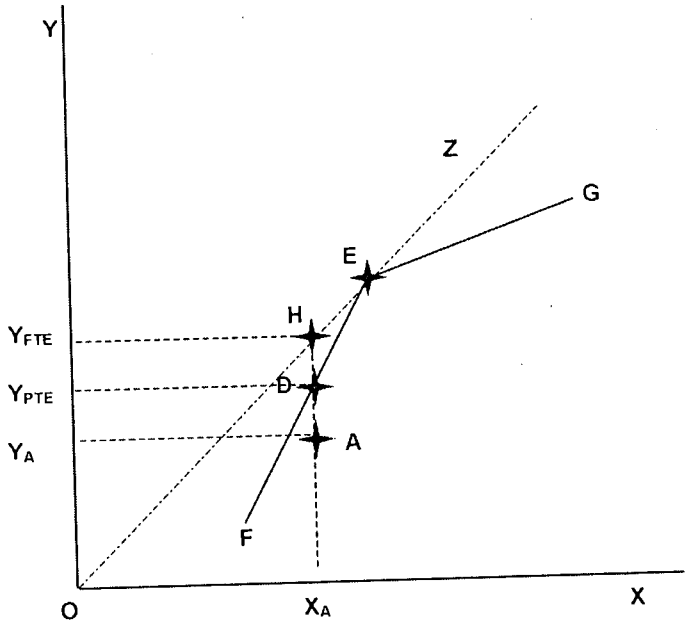

Fig1. Different Output Efficiency Measures

The line segment FEG is called the frontier. Output along this frontier represents the efficient outputs produced by farms that use an average technology rather than the best one. FEG represents the most output that could be generated given the set of inputs measured on the x-axis. All points bounded by the x-axis and FEG but not on FEG represent inefficient input-output combinations. Assume we observe a farm that uses input amount X_A to produce an output amount of Y_A. Drawing a vertical line from the point X_A on the x-axis to point D on the FEG, we locate point A corresponding to input-output combination (X_A, Y_A). The measurement of divergence of point A from the frontier FEG for the given level of input X_A, is called pure technical inefficiency (PTE). If farm producing at A were purely technically efficient, it could have produced output Y_{PTE} with input X_A. All farms observed on the frontier FEG are pure-technically efficient regardless of the scale of production. The segment OYA divided by OY_{PTE} measures pure technical efficiency of farms producing at point A.

Divergence of point A from constant returns to scale (CRS) technology is called overall or Farrell's measure of technical efficiency (FTE). The relevant frontier for CRS technology is a ray from the origin that is tangent to FEG. The line OZ from the origin represents the most productive scale size in that the output produced per unit of input is maximized. The overall technical efficiency at point A is measured with reference to point H on the ray OZ that uses the same amount of input as A.

The segment OY_{PTE} divided by OY_{FTE} measures the scale efficiency. It can be seen that Farrell technical efficiency is the product of scale efficiency and pure technical efficiency.

Model 1

$$FTE = \frac{OY_A}{OY_{FTE}}$$

$$FTE = \frac{OY_A}{OY_{PTE}} \times \frac{OY_{PTE}}{OY_{FTE}} \qquad (1)$$

$$FTE = PTE \times SE$$

The nonparametric models attribute all deviations of output from the frontier to inefficiency of the observed farm(s).

3. ESTIMATION PROCEDURES

In this research, models developed by Grabowski and Pasurka (1988) to measure technical efficiency were used. Let K be the total number of farms, M the number of outputs and N the number of inputs. Denoting the output matrix by U and the input matrix by X, U has the dimension (K x M) and X (K x N). The notation U_{km} denotes the mth output produced by the kth farm and X_{kn} the nth input used by the kth farm.

Let Z_k represent the (Kx1) vector that measures the intensity of utilizing a farm's technology. Each Z_k serves to construct the linear segments between observations to form the technology and its boundary (FEG or OZ in Figure 1). Different restrictions on Z_k produce a different type of technology. When each Z_k is restricted to be positive only, constant returns to scale technology (OZ) will be mapped. When each Z_k is restricted to be positive and the sum $Z_1+Z_2...+Z_k=1$, a variable returns to scale technology is mapped (FEG). When each Z_k is positive and $Z_1+Z_2...+Z_k \leq 1$, the model produces non-increasing returns to scale technology (EF in Figure 1) allowing for constant and decreasing but not increasing to scale. These restrictions are used to measure Farrell, pure technical, and scale efficiencies.

The following linear programming problem was solved for each observation k.

Maximize Θ_k

(Θ,z)

subject to

$$\text{(i)} \quad \sum_{k=1}^{K} z_k u_{km} \geq \Theta_k u_{km}, \qquad m = 1,\ldots,M$$

$$\text{(ii)} \quad \sum_{k=1}^{K} z_k x_{kn} \geq \Theta_k x_{kn}, \qquad n = 1,\ldots,N$$

$$\text{(iii)} \quad z_k \geq 0, \qquad k = 1,\ldots.K. \qquad \textbf{(2)}$$

In this model Θ_k is the efficiency parameter that measures the efficiency of farm k in transforming its inputs X_k into outputs U_k. if $\Theta = 1$ for the kth farm, it indicates the farm is on the frontier while $\Theta = 1.5$ indicates that the farm could produce $1.50*U_k$ by using the same amount of inputs and using the frontier technology. This model measures Farrell technical efficiency and is referred to as $F_o(X_k,U_k|CRS)$. The constant returns to scale output technical efficiency measure can be decomposed into pure technical efficiency and output scale efficiency. The pure technical efficiency measure is obtained by re-solving model (2) under the assumption of variable returns to scale rather than constant returns to scale. This is done by restricting the sum of the intensity variables Z_k for all farms to be equal to one. Thus, the following constraint is added to model (2) and re-estimated for all K observations:

$$\text{(iv)} \quad \sum_{k=1}^{K} z_k = 1, \qquad k = 1,\ldots.K. \qquad \textbf{(3)}$$

Model (3) measures pure technical efficiency and is referred to as $F_o(X_k,U_k|VRS)$. Scale efficiency is the ratio between the constant returns to scale and the variable returns to scale measures.

$$SE_o(X_k,U_k) = F_o(X_k,U_k \mid CRS)/F_o(X_k,U_k \mid VRS) \qquad k = 1,\ldots,K. \qquad \textbf{(4)}$$

If $SE_o = 1$, the observed farm is scale efficient, if $SE_o > 1$, it is output scale inefficient. If a farm is not scale efficient, it can be determined whether the farm is facing increasing or decreasing returns to scale. The following restriction on Z_k is imposed and included in model (3) as constraint (iva) instead of constraint (iv):

$$\text{(iva)} \quad \sum_{k=1}^{K} z_k \leq 1, \qquad k = 1,\ldots,K. \qquad \textbf{(5)}$$

This solution is referred to as $= F_o(X_k,U_k \mid NIRS)$ where NIRS stands for non-increasing returns to scale. For a farm where $SE_o > 1$, $F_o(X_k,U_k \mid CRS) = F_o(X_k,U_k \mid$

NIRS), then the kth farm faces increasing returns to scale. If $F_o(X_k,U_k \mid CRS) \neq F_o(X_k,U_k \mid NIRS)$, then farm faces decreasing returns to scale.

4. DATA AND SAMPLE DESCRIPTION

The data used in this analysis were obtained from Punjab Economic Research Institute (PERI)[1] which collected it in the crop year May 1990 to April 1991 from five districts (Vehari, Khanewal, Multan, Faisalabad and Gujrat) located in the central part of the Punjab for a benchmark survey for an irrigation project. In this study data of only 387 farms is included which produced the following crops: cotton, wheat, rice, sugarcane and corn. These crops covered 90% of cropped area of sample farms. They are also the major crops of irrigated agriculture in Punjab. Table 1 contains a summary of the socio-economic characteristics of farms and their operators. The average level of farmers' education is only under primary. In fact, 200 sample farmers were not literate. The family size averaged 8.79 members resulting in availability of substantial family labor. On average, 129 man-days of total labor per acre were used, with 111 man-days contributed by family labor. The average cropping intensity on sample farms was 156% of cultivated area. The average farm size was 8.70 acres. Only 3.88% of farms exceeded 25 acres. Most of the irrigated area is either canal irrigated only, or tube-well irrigated only.

Following Grabowski and Pasurka (1988) the capital stock was measured as the total value of livestock, machinery, implements and buildings, capital input was measured as a flow variable by adding the return to farm capital to the average depreciation cost of farm assets. Buildings were assumed to depreciate at 2% per year, machines and their implements at 10% and hand tools at 20%. The return to farm capital was calculated at 10.59% that was the weighted average rate of interest on all scheduled bank advances in 1991 [GOP (1994), Table 7.7, Statistical Appendix]. Hired labor was measured in man-days hired, family labor in adult male units of full time farmers in the family working for the whole year. Family labor was valued at the wage rate of hired labor. Inputs for livestock consisted of only purchased inputs. All fodder crops produced by sample farms were assumed to be fed to animals and included as an input.

Outputs used in the study were classified into three categories: (a) crops, (b) livestock, and (c) custom hiring services from the family's non-labor resources (land, tractors, and tube-wells). Livestock production consisted of milk and non-milk outputs. The third output consisted of custom hiring of land and farm machinery services which is quite common in the sample area. The number of sample farmers producing different outputs is given in Table 2. In this sample, crops contributed 71%, livestock products 25%, and custom hiring 4% of the total farm revenue. Similarly, the inputs were aggregated in the categories as shown in Table 3. For the purpose of aggregation, each input and output prices were normalized on their mean price.

1 PERI has already published a report on this data. See Shahid, S.A., M. Haq, and M.J. Khan. (1992)

5. RESULTS

Table 4 contains the results. Nearly 30% of all sample farmers were Farrell (overall technically) efficient. The mean level of overall technical inefficiency was 1.3959 implying that 39.59% more farm output could be produced if all sample farms were Farrell-technically efficient. Roughly 40% of the farmers were pure technically efficient. The mean level of pure technical efficiency was 1.30. In other words agricultural output could be increased by 30% if all farms produced on the production frontier (FEG in Figure 1). Although most farmers in the sample were not scale efficient, the average level of scale efficiency was 1.07. Thus, production below the frontier is a more severe problem in the Punjab than that at the incorrect scale. Most scale inefficient farmers were producing in a region of increasing returns to scale. In other words, if all inputs, including land, are doubled, their output will more than double. Only 39 out of 271 scale inefficient farmers were producing in a region of decreasing returns to scale. In developing countries where the population is rapidly growing and farm sizes are small (80% of farms in Pakistan are less than 12.5 acres of land each), most of the farms are too small to be scale-efficient. This study does not support land reforms.

6. SOURCES OF TECHNICAL EFFICIENCY

In this section econometric models are used to determine a relationship between efficiency and a set of explanatory variables. The efficiency index has a censored distribution in that it cannot be less than one. As noted by Greene (1990), if ordinary least square (OLS) is used for this model, the parameter estimates will be biased toward zero. For censored continuous distributions, it is common to use the Tobit model [Greene (1990)]. The parameter estimates of the Tobit model are determined by applying maximum likelihood estimation that maximizes the joint probability of observing the given sample. Following Chavas and Aliber (1993), the following Tobit model was estimated for Farrell, pure and scale efficiency indices:

$$EL_{ki} = W_k B + e_k, \qquad if \;\; W_k B + e_k > 0,$$

$$= 0 \quad otherwise,$$

$$where \;\; EI_{ki} = 1 - \frac{1}{\Theta_k}. \qquad (6)$$

W is a vector of variables expected to influence the efficiency index EI_{ki} where the subscript I stands for an efficiency index (overall technical efficiency, pure technical efficiency, or scale efficiency indices), k is the farm and e_k is an error term distributed ~$N(0,\sigma^2)$. The set of explanatory variables includes age of the head of household, age squared, education of the head of household measured by the number of school years attended, a binary variable which is 1 if the farmer applied only canal irrigation and 0 otherwise. Farm size is measured by acres cultivated, the amount of debt is measured in rupees, and the district binary variables were: District 1 stands for Faisalabad, 2 for Khanewal, 3 for

Vehari, and 4 for Multan. The fifth district, i.e. Gujrat, was excluded from the regressions and served as the reference district.

The Tobit regression results are reported in Table 5 for each efficiency index. Because the nonlimit dependent variable values represent inefficiency, the signs of the coefficients indicate the direction of response of inefficiency to changes in explanatory variables. The parameter estimates obtained from the Tobit model are not marginal effects as those obtained from OLS regressions. In Tobit models, hypotheses are tested by using the χ^2 test given in Greene (1990). The test statistic used to test hypotheses from maximum likelihood functions is $\chi^2 = -2\lambda$ with an α level of significance and j degrees of freedom, where j is the number of restrictions to be tested. The statistic $\lambda = \ln L_r - \ln L_{ur}$, where ln is the natural logarithm, the subscript r is for the restricted model and the subscript ur is for the unrestricted model and L is the value of likelihood function. To test the joint significance of all variables in the model, the natural logarithm of the maximum likelihood function regressed on intercept only, $\ln L_r$ is calculated. Greene (1990) has shown that $\ln L_r = \Sigma_t\, n_t * \ln p_t$ where n_t is the number of observations with attribute t, and p_t is the proportion of observations with attribute t. In this study an observation can have one of the two attributes, efficient or inefficient for a given efficiency index. The restricted model contains only intercept and the unrestricted model contains the nine independent variables. For the Farrell inefficiency regression, the $\ln L_{ur}$ given by the Tobit estimate is -111.208. The number of inefficient observations equals 272 that constitute 70.28% of sample farms. The number and proportion of efficient observations is 115 and 0.2972 respectively. Therefore $\ln L_r = -235.465$ resulting in a χ^2 of 248.51. The critical value for a χ^2 with 9 degrees of freedom and an α of 5% is 16.92. Therefore, the Farrell regression is highly significant.

The Farrell inefficiency regression indicates that farm size is highly significant in explaining inefficiency. Overall inefficiency decreases as farm size increases. In addition, the education variable is significant at a 90% confidence level with a negative sign implying that Farrell technical efficiency increases with education level. The loan variable is nearly significant at the 90% confidence level implying that Farrell efficiency increases as debt increases. Education, farm size, and debt increase Farrell efficiency of farmers. Districts 1, 2 and 4 are significant and positive implying that the mean inefficiency levels in these districts are higher than the mean inefficiency of Gujrat.

Since Farrell technical efficiency is decomposed into pure technical and scale efficiency, it is also useful to examine factors which influence pure technical and scale efficiencies. Table 5 shows that Tobit regressions for both pure technical and scale inefficiency indices are highly significant. The coefficient estimates and the t-ratios show that pure technical efficiency is not significantly affected by education level, farm size or debt. In fact, the only variables that influence pure technical inefficiency are the district variables. Districts 1 and 4 are significantly more inefficient than Gujrat.

Scale inefficiency is significantly highly and negatively influenced by farm size, education, and debt. It appears that more educated farmers who have the ability to rent land and borrow money are more efficient than their counterparts. The higher efficiency of large farmers likely emanates from their higher education levels and greater access to credit.

7. SUMMARY OF CONCLUSIONS

This study shows that in the sample area, about 40% of output in the sample year was foregone due to Farrell inefficiency. The main source of Farrell inefficiency was pure technical inefficiency, which averaged 30% for the sample farms. Although mean scale inefficiency was only 7%, 70% of farmers were scale inefficient. Scale efficiency was significantly and positively associated with farm size, educational level of the farm operator and debt. The study finds that it is important to decompose overall technical inefficiency into pure technical and scale inefficiencies. The results of this study imply that in the long run, technological forces will increase farm size in the Punjab. Elimination of imperfections in agricultural land market could increase the productive efficiency of the agricultural sector in Punjab. Increasing the educational level of farmers, particularly small farmers, training in non-agricultural skills, and an expansion of job opportunities in non-farm sector is required to increase agricultural efficiency.

Table 1
Major Socio-Economic Characteristics of the Sample Farmers

Attribute	Mean	Standard Deviation	Minimum	Maximum
Farm Manure (Loads)[a]	6.67	7.92	0	75.89
Fertilizer (Nut. Kgs)[a]	91.22	46.97	0	336.55
Total Labor (Mandays)[a]	128.78	106.00	10.44	627.89
Family Labor (Mandays)[a]	111.46	108.48	3.20	627.89
Area Sown/Cultivated Acre	1.56	0.38	0.36	2.77
Irrigation Water (Acre feet)	2.55	0.72	0.23	6.75
Canal Irrigation-Acres	46.79	47.34	0	275.68
Tube-well Irrigation-Acres	42.74	63.73	0	481.00
Mixed Irrigation-Acres	7.80	27.14	0	207.75
Cultivated area (Acres)	8.70	8.19	1	62.00
Institutional Loans (Rs)	9354.00	34415.00	0	487200.00
Bullock Operations (Acres)	4.51	6.38	0	26.89
Tractor Operations (Acres)	3.65	2.94	0	18.49
Age of Operator (years)	46.27	15.49	12.00	90.0
Years of Schooling	3.93	4.59	0	16.00
Family Size (numbers)	8.79	4.23	2.00	29.00

[a] denotes " per cultivated acre".

Table 2
Number of Sample Farmers Producing Different Farm Products

Outputs	Number Producing
Crops	387
Wheat	382
Kharif Fodder	351
Rabi Fodder	344
Indigenous Cotton	42
American Cotton	293
Sugarcane	161
Grain Maize	75
Fine Rice	30
Livestock Products	387
Custom Hiring Services Output	62
Total Sample Size	387

Table 3
Inputs Categories Used in Analysis

1.	Land	▪ Family Labor
2.	Labor (Three Types)	▪ Annually Hired Labor ▪ Casually Hired Labor
3.	Irrigation Water (Two Types)	▪ Canal Water ▪ Tube-well Water
4.	Cultural Operations (Four Types)	▪ Plowing (by bullocks, tractors) ▪ Leveling (by bullocks, tractors) ▪ Hoeing (by bullocks, tractors, manually) ▪ Planking (by bullocks, tractors)
5.	Capital Inputs (Five Types)	▪ Buildings ▪ Machines (tube-wells, tractors, combines) ▪ Mechanical implements ▪ Hand tools ▪ Livestock
6.	Fertilizers	▪ Chemical fertilizer ▪ Animal manure
7.	Seeds (All crops)	
8.	Threshing and Picking	
9.	Fodders and Feeds	
10.	Miscellaneous Costs	▪ Weedicides ▪ Insecticides ▪ Fuel, Electricity ▪ Repair and Maintenance

Table 4
Mean Efficiency Measures for Sample Farms

Item	FTE	PTE	SCE
Mean Efficiency	1.3959	1.3018	1.0733
Standard Deviation	0.4991	0.4407	0.1567
Minimum Efficiency	1.0000	1.0000	1.0000
Maximum Efficiency	5.0029	4.8805	2.5647
Efficient Farms (No.)	115	154	116
IRS Farms (No.)	-	-	232
DRS Farms (No.)	-	-	39

FTE = Farrell technical efficiency, PTE= pure technical efficiency
SCE= scale efficiency, IRS= increasing returns to scale, and
DRS= decreasing returns to scale

Table 5
Factors Influencing Inefficiency for Sample Farms

Parameter	Farrell Inefficiency		Pure Technical Inefficiency		Scale Inefficiency	
	Estimate	t-ratio	Estimate	t-ratio	Estimate	t-ratio
Constant	0.05728	0.42471	0.01243	0.08299	-0.01457	-0.24322
Age	0.00233	0.48674	-0.00139	-0.26316	0.00312	1.46524
Age squared	-0.00004	-0.84336	0.00000	-0.03765	-0.0004	-1.65442
Educational canal	-0.00572	-1.82437	-0.00493	-1.41896	-0.00211	-1.52349
District 1	-0.00027	-0.00643	0.00540	0.11596	-0.01251	-0.66846
District 2	0.18578	2.83212	0.20958	2.80055	0.04255	1.47601
District 3	0.12328	2.23722	0.11784	1.50833	0.07285	2.42102
District 4	0.10848	1.52202	0.11209	1.38632	0.03923	1.24740
Farm size	0.39828	4.99405	0.39502	4.41294	0.11295	3.21865
Debt	-0.00437	-2.13606	0.00007	0.03388	-0.00520	-5.12846
Log likelihood	-0.00000	-1.61713	0.00000	-1.50825	0.00000	-1.70553
Observations	-111.208	-	-147.786	-	131.777	-
Positive Observations	387	-	387	-	387	-
Percent of Positive	272	-	233	-	271	-
Observations	0.7028	-	0.6021	-	0.7003	-

REFERENCES

Banker, R.D., A. Charnes, and W.W. Cooper (1984), "Some Models for Estimating Technical and Scale Inefficiencies in Data Envelopment Analysis", *Management Science*, 30(9): 1078-092.

Banker, R. (1984), "Estimating Most Productive Scale Size Using Data Envelopment Analysis," *European Journal Of Operational Research*, 17: 35-44.

Battese, G.E., S.J. Malik, and S. Broca (1993), "Production Functions for Wheat Farmers in Selected Districts of Pakistan: An Application of a Stochastic Frontier Production Function with Time-varying Inefficiency Effects", *Pakistan Development Review*, 32(3): 233-68

Chavas, J.P., and M. Aliber (1993), "An Analysis of Economic Efficiency in Agriculture: A Nonparametric Approach", *Journal of Agricultural and Resource Economics*, 18(1): 1-16.

Debreu, G. (1951), "The Coefficient of Resource Utilization", *Econometrica*, 19(3): 273-92.

Farrell, M.J. (1957), "The Measurement of Production Efficiency", *Journal of the Royal Statistical Society*, Series A, General, 125, Part 2: 252-67

Fare, R., S. Grosskopf, and C.A.K. Lovell (1985), "The Measurement of Efficiency of Production", Kluwer-Nijhoff Publishing, Dordrechet, The Netherlands.

Ghosh, M. (1986), "Farm Size-Productivity Nexus Under Alternative Technoloy", *Indian Journal of Agricultural Economics*, 41(1):17-28.

Government of Pakistan (1994), "Economic Survey 1993-1994", Ministry of Finance, Islamabad.

Greene, W.H. (1990), "Econometric Analysis", Macmillan Publishing Company, New York, USA.

Panda, R. (1986) "Anomaly in the Use of Water in a Canal Irrigation System – A Case Study", *Indian Journal of Agricultural Economics*, 41(4):529-533.

Shahid, S.A., M. Haq, and M.J. Khan (1992), "Benchmark Survey of Irrigation Systems Management and Rehabilitation Project-II in Punjab (Pakistan), Lahore: Punjab Economic Research Institute.

Umesh, K.B. and S. Baisliah (1991), "Efficiency of Groundnut Production in Karnataka: Frontier Profit Function Approach", *Indian Journal of Agricultural Economics*, 46(1):20-33.

ECONOMIC CONFIDENCE-BUILDING MEASURES (CBMs) BETWEEN INDIA AND PAKISTAN

Saima Qayyum*

1. INTRODUCTION

South Asia is one of the most significant regions in the world. This region had always been a trade route for merchants, cradle of the knowledge, known for ancient civilization of the world and a center of politico-strategic interaction between empires. Since their creation India and Pakistan have been unable to reconcile with each other's existence. Consequently border clashes, wars, unresolved Kashmir issue, covert actions, arms race and subsequently nuclear blasts made possibilities of good friendly relations between these two neighbors impossible. Nuclear proliferation has aggravated the situation to such an extent that both the countries have been investing enormous economic resources, energies, and time in building their armed forces and equipping them with latest weaponry. There is a school of eminent thinkers, strategists and diplomats who believe that the build-up of nuclear armaments only increases insecurity and the likelihood of war. There is an old saying, "*to every cloud there is a silver lining*". The saner elements of both these countries at the same time have been trying to cultivate an atmosphere in which tension and conflicting relations could be softened.

Peace is not just an 'absence of war'. Peace also means to be involved in all forms of peaceful international relations, like economic, political, diplomatic, other forms of communication, interaction, and, above all, freedom from fear, distrust, tension, and threat among nations. Peace requires initiative both at formal level and at less formal level by all those countries that have a quest for peace. At formal level confidence is built between governments through mutual agreements and bilateral treaties. On a more informal level, ordinary people also undertake their own confidence building initiatives, sometimes described as 'people's détente or track III diplomacy.

Economic CBMs are one of the most important confidence-building measures between states. They are solid CBMs as they do not involve the interest of one group of people rather the opening up of economic and trade relations will involve groups, industrialists, companies, corporations, banks, businessmen and individuals. Any negative step from either side affects a major portion of the society. Therefore, these people can and should put pressure on their respective governments to take positive steps towards peace and security.

A brief review of Economic Confidence-Building Measures between India and Pakistan shows that these two countries have many forms of official, bilateral and multilateral economic relations. They include relations under bilateral trade; unofficial trade (smuggling); trade under SAARC, SAPTA-I, MFN Status, SAPTA-

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II, and SAFTA; Indo-Pakistan Chamber of Commerce relations; mutual economic agreements like Indus Water Treaty of 1960, IPPs Deal, as well as politics of Gas Pipeline etc.

2. BRIEF REVIEW OF ECONOMIES OF PAKISTAN AND INDIA

2.1 Pakistan's Economy

Pakistan's economy remained relatively more open and less import substituting in character than India's but failed to create a diversified, modern, and competitive industrial sector. Leading industries and exports of Pakistan still remain cotton textiles and other agro-based manufactures and semi-manufactured products. A major portion of Pakistan's export comprises of agricultural goods and primary products. In 1948-49, 56 percent of Pakistan's exports went to India while the percentage imports from India were 80 percent for East Pakistan and 50 percent for West Pakistan. By 1958, only 4 percent of Pakistan's exports went to India, as both countries actively disengaged and embarked on import-substitution strategies. Pakistan's economy grew at 6.8 percent in the 1960s, 4.8 percent in the 1970s, and 6.5 percent in the 1980s. It slowed to 4.7 percent over 1988-97. A key element relevant to India-Pakistan relations in this process has been the lowering of tariff barriers from a maximum of 225 percent to 45 percent over this period, and the reduction of quota restrictions. The trade deficit in Pakistan's trade with India was contained due to the increase in non-traditional exports despite rising imports, and a significant inflow of foreign direct and portfolio investment.

2.2 Indian Economy

India adopted an import-substitution industrialization strategy led by the public sector, with a highly protectionist trade policy, five-year plans, and comprehensive government controls on economic activity, particularly from 1956 onwards. However, the large-scale private manufacturing industry continued to grow. This model further strengthened in the late 1960s with the nationalization of banks in 1969, the Foreign Exchange Regulation Act of 1973, and the tightening of controls on foreign firms in India. An intensified round of import-substitution was launched in the early 1970s. Serious liberalization of the economy and the gradual dismantling of controls began only from 1991. As late as 1991, the peak import tariff was 300 percent, the average tariff about 100 percent and there were import quotas on a vast range of products. This has now come down to a peak tariff of 38.5 percent, an average tariff lower than 30 percent, and a commitment to phase out all quantitative restrictions by 2002. India's share of world trade contracted as India failed to compete in a range of industries, and failed to attract significant foreign investment.

In November 1981, Pakistan participated in international trade exhibition held at New Delhi. Moreover, in order to promote the bilateral trade between India and Pakistan a meeting was held between Pakistani and Indian foreign secretaries in New Delhi on 15th November 1985. During the meeting they discussed the bilateral trade issues.

On 4th July 1986 an agricultural cooperation agreement was concluded. On 7th December 1987 foreign secretaries of India and Pakistan met in New Delhi to discuss the various trade issues. They signed an agreement on 11th December 1987 under which they highlighted the importance of trade relations between the two adversaries. They decided to send their trade delegations.

3. BILATERAL TRADE BETWEEN INDIA AND PAKISTAN

Historically, trade between the two countries has seen a fluctuating pattern. However, Indo-Pakistan bilateral trade has remained at a very low level. Immediately after independence, India was Pakistan's largest trading partner. However, the 1965 War virtually ended all trade relations between the two countries. Since the beginning of the 1960's the share of India in Pakistan's total trade started declining and reached a low of less than one per cent by 1997. This is despite the fact that Pakistan has increased the list of freely importable items from India from 42 in 1957 to 601 in 1998. Amidst this, the much-touted issues of political tension are secondary. The most vital factors are economic compulsions backed by domestic political exigencies in Pakistan. The late Mahbub-ul-Haq, a well –known Pakistani economist, estimated in the 1960s that the prices of commodities supplied to Pakistan under a number of tied credit agreements had exceeded the lowest quoted price in the international market by up to 170 percent. This deprived the Pakistani consumers from other competitively priced sources and made Pakistan an artificially high cost economy. The real reason is the politically driven trade policy of Pakistan. Though tea is the top most item in the 601 freely importable list of Pakistan from India it is not imported from India. This is because the two major multinational tea-trading companies in Pakistan have their tea gardens in Kenya and it is natural for them to make Pakistan a captive market. The gradual opening up came only in the seventies. Pakistan is willing to sell at least 2,000 MW of surplus electricity to India though high costs and poor infrastructure may be a major stumbling block in the deal.

Table 1 shows the foreign trade relations between India and Pakistan from 1951 till 2000.

Table 1
Foreign Trade Relations of Pakistan with India From 1951-1952 Till 1999-2000 (In Million Pakistani Rupees.)

YEARS	EXPORTS	IMPORTS	VOLUME OF TRADE	BALANCE
1951-1952	375.7	0.3	376.0	375.4
1952-1953	145.0	0.4	145.4	144/6
1953-1954	114.5	39.0	153.5	75.5
1954-1955	136.4	36.8	173.2	99.6
1955-1956	210.0	41.4	2551.4	168.6
1956-1957	141.4	67.2	208.6	74.2
1957-1958	87.6	88.0	175.6	-0.4
1958-1959	42.0	77.4	119.4	-35.4

1959-1960	96.0	82.6	178.6	13.4
1960-1961	105.0	131.2	236.2	-26.2
1961-1962	151.5	107.3	258.8	44.2
1962-1963	194.5	105.5	300.0	89.0
1963-1964	111.5	94.5	206.0	17.0
1964-1965	219.8	127.7	337.5	92.1
1965-1966	18.0	261.8	279.8	-243.8
1966-1967	0.7	2.2	2.9	-1.5
1967-1968	0.4	3.2	3.6	-2.8
1968-1969	0.005	0.05	0.055	-.045
1969-1970	0.06	0.2	0.26	-0.14
1971-1972	-	-	-	-
1972-1973	-	-	-	-
1973-1974	-	-	-	-
1974-1975	-	-	-	-
1975-1976	151.0	13.0	164.0	138.0
1976-1977	1.0	230.0	231.0	-229.0
1977-1978	347.0	471.0	818.0	-124.0
1978-1979	167.0	209.0	376.0	-42.0
1979-1980	479.0	130.0	609.0	349.0
1980-1981	962.0	22.0	984	940.0
1981-1982	602.0	79.0	681.0	523.0
1982-1983	340.0	60.0	400.0	280.0
1983-1984	343.0	148.0	491.0	195.0
1984-1985	498.0	261.0	759.0	237.0
1985-1986	465.0	197.0	662.0	268.0
1986-1987	324.0	166.0	490.0	158.0
1987-1988	483.0	341.0	824.0	142.0
1988-1989	940.0	614.0	1,554.0	326.0
1989-1990	757.0	816.0	1,573.0	-59.0
1990-1991	933.0	1,026.0	1,959.0	-93.0
1991-1992	2,814.0	1,213.0	4,027.0	2,701.0
1992-1993	2,175.0	1,748.0	3,923.0	427.0
1993-1994	1,2880	2,126.0	3,414.0	-838.0
1994-1995	1,284.0	1,974.0	3,258.0	-690.0
1995-1996	1,379.0	3,172.0	4,551.0	-1,793.0
1996-1997	1,412.0	7,980.0	9,392.0	-6,568,0
1997-1998	3,912.0	6,675.0	10,587.0	-2,763.0
1998-1999	8,741.0	7,205.0	12,982.0	1,536.0
1999-2000	2,387.0	4,241.0	6,628.0	-1854.0

Source: *Economic Surveys of Pakistan, Government of Pakistan, Islamabad. [Various Issues].*

Table 1 shows that in 1951-52 Pakistan's exports to India were Pakistani Rs.375.7 million, while the imports from India were to a tune of approximately only Pakistani Rs.0.3 million with a trade surplus of Pakistani Rs.375.4 million. In 1957-1958 Pakistan's exports to India were (in Pakistani Rs.)87.6 million and her imports from India were approximately 88.0 million and for the first time Pakistan had a trade deficit with India to the tune of 0.4 million. Between 1961-62 and 1964-65, Pakistan's trade balance with India was once again in surplus. The volume of trade in 1964-65 was 34.74 million and Pakistan's trade surplus was

9.2 million. In 1965-66 Pakistan's trade surplus was 9.2 million. In 1965-66 Pakistan's trade with India went into a deficit to the tune of 8.2 million. Trade between the two countries started diminishing between the periods of 1965 and 1971 due to armed conflicts between them. From 1971-72 till 1974-75 there was no trade between these two rival states. In 1975-76 Pakistan's exports to India were 151.0 million and her imports from India were 13 million. Total volume of trade between the two countries was 164.0 million and Pakistan had a trade surplus of 138.0 million. The next three years Pakistan and Indian trade relations stayed at their minimum with Pakistan having a trade deficit in all the three years till 1979-1980. From 1980-81 onwards trade relations between the two countries have started picking up slightly with Pakistan maintaining a continuous surplus in its balance of trade with India due to stinging tariff and quota policy for imports of Indian goods. Trade relations between the two countries are picking up since 1995-96 and with relaxing of trade barriers and commercial policy regime towards India and other countries. This is due to Pakistan's and India's membership in the World Trade Organization, the volume of trade between them is quite good and in year 1999-2000 had reached 13 billion Pakistani rupees. Trade relations should enhance people-to-people contacts, increase dependency on the economies of each country and therefore should act as CBM in promoting regional security and peace.

There are about 800 products, which Pakistani government allows to be imported from India on its fixed import list. Major Pakistani imports from India are Soya bean, oil cakes, iron ore, ships for breaking up, and food products. These patterns of development over half a century, combined with the political antagonism between India and Pakistan, have resulted in extremely weak economic ties.

4. INFORMAL TRADE (Smuggling etc.)

Unofficial or informal trade would include cross-border smuggling between the nationals of both countries and trade between them through third party or country. There were 576 to 800 items officially being traded between India and Pakistan. However the informal trade between the two countries is estimated to be about US$ 200 million while trade through third country is estimated to be around US$ 500 million – a total of US$ 700 million. *The Pioneer* of 10th July 2000 reported, an organized gang from Pakistan was pushing pirated music cassettes and compact discs in India using railways, roadways and air routes. Cost of production of these materials is low in Pakistan. This volume of informal trade between the two countries bypassing official channels is estimated to have reached about $1.5 billion in 1999-2000, three times the volume of official trade between India and Pakistan. Estimates of the volume of Indian goods smuggled into Pakistan over the years amount to US$1 billion to US$ 2 billion. It comprises of betel leaves, nuts, tea, spices as well as cattle tyres, textiles, coffee, spare parts, small engineering goods, audio video cassettes and pharmaceutical products. Pakistani products, such as edible oil, dried fruits and textiles, have also made their way across the Indian border.

Indian and Pakistani businessmen are ready to have joint ventures in a 'third country, and the ultimate beneficiary will be the third country. Trade relations between India and Pakistan can flourish in areas such as agricultural and mineral products, including tea, cotton, sugar, edible oils, spices, rock salt, and phosphates, and some manufactures such as fertilizer, cement, tyres, auto components, textile and tannery chemicals, pharmaceuticals, and plastic raw materials. As pointed out by Sahabazada Yaqub Khan, the former Foreign Minister of Pakistan, "trade was important but the phobias, apprehensions, and anxieties in Pakistan, which created a feeling that it would lead to the destruction of its industries, had to be tackled carefully. Both sides should move on the trade front, steadily and progressively, with understanding and sensitivity."

5. REGIONAL AND MULTILATERAL TRADE UNDER SAARC

There is a growing trend of trade relations between India and Pakistan with a gradual growth of preferential trade since the mid-1990s. Under the auspices of SAARC[7], SAPTA-1, initiated in 1995 and later SAPTA-II, and SAPTA-III has generated to date three rounds of negotiations towards intraregional trade liberalization based on a commodity approach. A fourth round is scheduled soon. SAPTA was signed by the SAARC member states in 1993. The SAARC Chamber of Commerce and Industry, formed in 1994, has had limited success in promoting regional trade or investment or in influencing the SAPTA negotiations. Grant of Most Favored Nation (MFN) Status under SAPTA calls for expansion in regional trade by offering its signatories exchange of concessions in tariff, par-tariff, and non-tariff measured on preferential basis and adoption of direct trade links among member states. Pakistan has committed itself to reduce tariffs by 10% on 35 items imported from other SAARC countries while India has offered similar tariffs reductions on 106 items. Also 'binding' MFN status clauses in the World Trade Organization (WTO) Agreement would eventually force India and Pakistan, to dismantle trade barriers. In the WTO's Agreement (Article XXI), there are six safety clauses that a member country can invoke to safeguard its interests, in case of; (i) Dumping by an exporter, (ii) Export subsidies being used to get an unfair advantage, (iii) A fear of serious damage to balance of payment problem, (iv) A threat to national security, (v) Genuine reason to protect domestic producers, and (vi) A threat to the structure of the economy. A large number of Pakistani businessmen have apprehensions about granting India the MFN status by Pakistan. They are afraid that more efficient and cost effective Indian products would flood Pakistani Markets and ruin them. The whole argument is trying to reinforce the protectionist policy of import substitute industry as compared to those businessmen in Pakistan who genuinely want to export their goods into Indian markets or the consumers who would be glad to buy better and cheaper Indian goods.

The SAPTA process has been hampered by the Rules of Origin System based on import content norms (presently, sixty percent local content is required), since the present stage of development of many members does not allow them to undertake higher value added activities. An important problem facing both India and Pakistan to increase trade relations, as an instrument

towards mutual peace is that, both their economies are competitive rather than complementary with many of the exports of both being in the same product categories. The products that these two countries produce and export include textiles, leather goods and footwear, marine products, and other labour-intensive manufactures. Complementary goods that can be traded between them will grow in the long run as economies lower tariffs and phase out quantitative restrictions under their WTO obligations. This trend will be reinforced as SAPTA progresses to SAFTA, and as both India and Pakistan (particularly India) attract foreign direct investment, which will increasingly be interested in expanding from single-country to regional markets. This will follow only when confidence is built in the politics-proof reliability of Trans-border trade procedures.

6. INDIA-PAKISTAN CHAMBER OF COMMERCE AND INDUSTRY

The Indo-Pakistan Chamber of Commerce and Industry was formed in March 1999 after Prime Minister Vajpayee's visit to the historical Pakistani city of Lahore. A fifty-eight member Indian business delegation arrived in Karachi on March 7, 1999 headed by the President of Federation of Indian Export Organization (FIEO), and met with the Karachi Chamber of Commerce and Industry members. In the same spirit, the Indo-Pakistan Chamber of Commerce and Industry (IPCCI) was inaugurated on April 10, 1999. The basic thrust of these meetings, negotiations and agreements was to continue the dialogue and discussions at various levels. A seventy five-member business delegation visited FPCCI early April 1999. During this meeting in Islamabad, one of the most discussed issues was a proposal to give India the MFN trading status. During a visit of the Indian trade delegation, both sides went to significant lengths to generate goodwill and positive sentiment on the issue of bilateral trade. A recently held Pakistan Peace Conference's working group on the Economics for Peace concluded: "The case for greater economic interaction between Pakistan and its neighbors is overwhelming. There is already a great deal of trade that goes on informally or through third countries. Pakistan has also signed up to be a part of international trade agreements, which necessitate opening up to all countries including India. In other words, greater trade and economic cooperation is not just beneficial, but inevitable."

7. ECONOMIC AGREEMENTS BETWEEN INDIA AND PAKISTAN

Basically there is only one well-defined and effective Economic CBM between India and Pakistan - the Indus Water Treaty signed in 1960. The Indus Water Treaty not only continues to work effectively, but it also serves as a model CBM for future Indo-Pakistani agreements. It is expected that these two countries have the potential in the future to conclude more economic CBMs. These Economic CBMs can be in the realm of electricity deal, and agreement for laying of gas pipeline between Iran and India through Pakistan.

7.1 The Indus Waters Treaty

The Redcliff line partitioning the two countries in 1947 cut right through the basin with five of the six rivers, the Indus, Jehlum, Chenab, Ravi, Bias, and

Sutlej, flowing from India (including the Indian side of Jammu and Kashmir) into Pakistan. On 1st April, 1948, with the expiry of the Standstill Agreements on waters, the Indian state of East Punjab shut off water from the Upper Bari Doab Canal, which it controlled, to the Central Bari Doab Canal in Pakistani Punjab. This triggered the first major economic conflict between the two countries. Following a temporary compromise agreement of May 4, 1948, efforts were made to establish a formula for the quantitative sharing of the Indus river waters. The core problem however, was the fact that there were no clear-cut rules of international law on river waters until 1966 (Helsinki Rules on the Uses of Waters on International Rivers). Pakistan wanted to go to the International Court of Justice in 1952 but India advocated bilateralism. At this juncture, in May 1952 the World Bank offered its good offices as a mediator and offered a comprehensive plan for the joint development of the Indus system's waters. In February 1954, the "World Bank followed up with a proposal that was based on the principle of dividing the rivers between the two countries. The core features of the 1954 proposal were; a division of the waters such that the waters of three western rivers, the Indus, Jehlum, and Chenab, were to be exclusively for Pakistan's use. And waters of the three eastern rivers-the Ravi, Beas and Sutluj were to be exclusively for India's use. Both sides accepted the World Bank proposal of 1954 as a basis for negotiation for settlement of the dispute. A Permanent Commission on the Indus Water was set up with engineers on both sides meeting once every two months to exchange data on cultivation and irrigation. These exchanges continued right through the periods of maximum tension in Indo-Pakistan relations for the past fifty-four years.

In 1977, there was even an agreement between India and Pakistan that was, strictly speaking, a deviation from the Indus Basin Treaty. The Salal hydroelectric project on the Chenab in Jammu and Kashmir was negotiated by India and Pakistan and has not been disputed by subsequent governments. The The project provides waters to Pakistan in a regulated manner but involves no diversion by India. Three key features distinguishing the Treaty from earlier river dispute settlements. were, 1) water supplies must continue to be given to areas receiving them historically, but they need not be from the existing sources i.e. Pakistani areas dependent hitherto on the eastern rivers could get their supplies from the western rivers; 2) the greatest possible freedom of action by each country in the operation, maintenance, and future development of its irrigation facilities; 3) assistance for Pakistan from six friendly nations and the World Bank to construct a system of replacement-cum-development works worth $1 billion. In addition to some special features of the Treaty, there was international mediation by the World Bank, without which the Treaty might perhaps never have been negotiated.

7.2 Electricity Deal between the Two Countries

A proposal, which has been discussed since 1996 under the United Front government in India, is the export of surplus electricity from Pakistan to Northern India. Prime Minister of Pakistan made the proposal to the Indian Prime Minister when they met at the United Nations in September 1998. A power surplus for

years to come was anticipated for Pakistan from the end of the Pakistani Eighth Plan in 1998. A proposal was backed by the IPPs, who had come on stream in Pakistan with the liberalization of the power sector in the 1990s, to export power to the Power Grid Corporation of India to meet the shortfall in India's northern grid. Pakistan was willing to sell at least 2,000 MW of surplus for Power and Water. Mr. Haleem Siddiqui, said; "In principle we have agreed to the Indian proposal and talks will start as soon as possible". Visiting Union Minister for power, Mr. Rangarajan Kumaramangalm declared that India has "accepted" Pakistan's offer to sell 2,000 MW of electricity, and very soon negotiations could take place if Pakistan were to take follow-up action. India and Pakistan were likely to make headway on the power purchase project with the arrival of a high level delegation from Pakistan for the second round of talks scheduled to begin. The first round of technical discussions on export of power to India was held at Islamabad in November 1998. The second round of talks was expected to focus on the pricing formula besides technical, financial and legal issues involved in transfer of power. At the November meeting, an agreement on transfer of power up to 500 MW in the short run and 2000 MW in the long run was broadly reached. The issues of price, quantity and time period of purchase of power by India from Pakistan was on the agenda of the Pakistan delegation. Power could be supplied by Pakistan to India from four Independent Power Producers (IPPs)- Japan Power, Saba Power, Kohinoor Power and Southern Electric Company- situated near Lahore. The estimate was that if Pakistan had a surplus capacity of 2000 megawatts for export, it could earn as much as $1.2 billion per year for perhaps up to twenty years. However, the deal fell through over price. It also fell through because of a quarrel between the IPPs in Pakistan and the government over high power tariffs within Pakistan. The important point to note here, though, and a reason why a deal can still be struck, is the fact that, from October 1998, both governments were keen on quickly finalizing the deal so that it could "considerably rev up the then ongoing foreign secretary-level talks".

7.3 Iran-India Gas Pipeline through Pakistan

There has been much talk in recent years of economic cooperation in the laying of gas pipelines from Iran, the Persian Gulf, and Central Asia through Pakistani land or maritime (continental shelf) territory to India. Several proposals have been offered in lieu of strategic considerations. Possible gas pipelines from Turkmenistan, Iran, Qatar, or Oman through Iran and Pakistan over land, or undersea within Pakistan's maritime territory, have several advantages. Natural gas, which is abundant in these countries and far less so in India and Pakistan, is an economical and environmentally less polluting fuel for thermal power plants. Both countries depend largely on thermal power now and will continue to depend on it in the foreseeable future. It would make both economic and environmental sense for India and Pakistan to phase in greater use of gas as opposed to coal or fuel oil for thermal power. Pipeline technology is mature and would be more economical than the import of Liquefied Natural Gas (LNG) for both countries. A joint pipeline would make possible greater economies of scale and lower unit costs than a separate pipeline for Pakistan alone. It would cost as much as 25 to 30 percent less than importing LNG for Pakistan and northern India. The India –

Iran gas pipeline project is an inevitable development that will have an impact on the socio-economic and geo-strategic condition of South Asian region. The three countries have quietly discussed and pondered over the idea for some time. Compared to the off-shore pipeline, the onshore one is a cheaper option. It is also the one that will benefit the three parties. While Iran and India will be the direct seller and buyer, Pakistan would gain financially by making its territory available as a transit route. Islamabad could expect to make $200 million or more per month as transit charges. The Pakistani government has approved a pipeline from Iran across Pakistan to supply gas to India. Jehangir Bashar, a Petroleum Ministry spokesman in Islamabad said on April 3, "It will be an on-shore pipeline and Pakistan will get transit fees for providing the passage."[16] A better-negotiated price could certainly help retire some of Pakistan's foreign debt. Moreover, this would help Pakistan build its image and credibility as an attractive venue for foreign investment. An on-shore pipeline passing through Pakistan could be a far greater guarantee against an Indian attack than even nuclear weapons. In June 2001, Pakistan agreed, in principle, after Iranian persuasion, to an Iran-India gas pipeline over its territory. India is not interested in the plan and is contemplating the LNG import route though it is costlier in the long run. On July 3, 2001 Pakistan's Gen. Pervaiz Musharraf said that he was in favor of a joint India-Pakistan gas pipeline from Iran which could pass from Pakistan. He said Pakistan would be willing to enter into any arrangement for the security of the pipeline to ensure the continuity of the gas supply to India.

During Agra summit, from 14th July to 16th July, 2001, it was expected that President Pervaiz Musharaf of Pakistan and Indian Prime Minister Vajpayee would be able to conclude an economic CBM in the form of gas pipeline agreement. But, Indian side remained unconvinced about the credibility of Pakistani assurances cited by Iran and Pakistan itself.

7.4 Direct Investments

Another economic CBM, which could be used to cement relations between the two nations and have as yet not been properly explored, is the direct private investments by the investors of both nations into economically viable projects in the other country's economy. This can follow by joint ventures and bilateral corporations producing and selling in both nations, taking an example from the economic model of EEC in Europe.

To sum up, there are several reasons for the still low level of economic cooperation between the two countries. First, quite apart from political conflict, the main reason for the low level of India-Pakistan trade and investment relations until now appears to be the fact that low-income economies, following a closed, import-substitution industrialization strategy, are largely complementary. Such economies do not need each other much except for some raw material or agricultural products, and even this level of trade is not prevalent between India and Pakistan. Second, although this pattern is beginning to change as is reflected in the growth of such trade in the 1990s. It has more to do with the general growth of their trade as a result of economic liberalization and a higher rate of GDP growth than because of the SAPTA process. Third, political conflict

is a factor in South Asia today. Pakistan has been unwilling to grant India Most Favored Nation status (although it is only a question of time under its WTO commitments) and both countries have created other obstacles for trade. This has resulted in the growth of trade through third countries. Fourth, it is unlikely that even without political conflict there could have been a great deal more economic cooperation between India and Pakistan until now. There is certainly not enough trade to give each a stake in the other's economy to a degree that commerce might spill over as a significant driver of security cooperation. The private sector players will be firms that are unlikely to cooperate or have the collective economic and political clout to drive policy on core security and non-economic foreign policy issues. Fifth, even more than trade, the real potential for complimentary and economic cooperation is in infrastructural goods, particularly gas pipelines from Central Asia, Iran and the Gulf, and the joint development and distribution of electric power. Harnessing information technology to provide IT and IT-related services for world markets is another possibility. In these areas, deals between businesses of the two countries can lead to further economic cooperation, such as downstream gas based fertilizer, petrochemical and power plants, and ultimately, security cooperation, look possible since these will have to be major inter-governmental initiatives to begin with.

8. CONCLUSIONS

For academic operational purpose South Asia is divided into larger states of India and Pakistan and smaller states like Sri Lanka, Bangladesh, Bhutan, Maldives and Nepal. For the last 54 years the two nations have kept a constant increase in arms built up, increasing their defense budgets over many years neglecting economic development in their respective countries. The result is that the two rival neighbors have colossal defense spending expenditure in India in 1998-1999, amidst an abundance of poverty, deprivation, misery and illiteracy in both nations. The rivalries of both these nations culminated in the buildup of nuclear arsenals and becoming nuclear states in May 1998. With a common nuclear deterrence and an ambitious missile program when these resources should have been channeled into economic and political reforms as well as for the uplift of standard of living of the people of the two nations.

For the people of India and Pakistan, this hostile relationship has fostered a national security situation, which legitimizes for their respective policy makers and hawks an arms race, culminating into a nuclear arm race. Militarization and distrust have undermined democratic institutions and strengthened the rise of ultra-nationalist religious right wing intolerance and hatred of minorities and war hysteria within the ranks of the extremists consequently, poverty and economic deprivation deepens.

India and Pakistan have many forms of official, bilateral and multilateral economic relations. They include relations under bilateral trade; unofficial trade (smuggling); trade under SAARC, SAPTA-I, MFN Status, SAPTA-II, and SAFTA; Indo-Pakistan Chamber of Commerce relations; mutual economic agreements like Indus Water Treaty of 1960, IPPs Deal, as well as politics of Gas Pipeline etc.

Historically, trade between the two countries has seen a fluctuating pattern. But on average Indo-Pakistan bilateral trade has remained at a very low level. Although immediately after independence, India was Pakistan's largest trading partner, the 1965 War virtually ended all trade relations between the two countries. Trade relations between the two countries are picking up since 1995-1996 and with relaxing of trade barriers and commercial policy regime towards India and other countries. This is due to Pakistan's and India's membership in the World Trade Organization, the volume of trade between them is quite good and in year 1999-2000 had reached 13 billion Pakistani rupees. Trade relations should enhance people-to-people contacts, increase dependency on the economies of each other's countries and therefore should act as CBM in promoting regional security and peace.

Track-III diplomacy (people-to-people contacts) is a process, under which popular segments of society like workers, artists, poets, musicians and others are involved. Unlike Track-I (Official diplomatic channels at the elite stage) and Track-II, (Officials meet in their unofficial capacity), in Track-III the exclusion of semi-elite gives a credible image of activities launched under its ambit. When people of India and Pakistan meet on different occasions they share common things which prove to be useful in building bridges of friendship in South Asia. In Track-III diplomacy, vested interests do not matter because the interaction of common people is not aimed to seek personal benefits but to broaden the involvement of common people in resolving hard pressing problems. Since under the auspices of Track-III wide participation from different segments of society is ensured, it becomes easier to remove mistrust and suspicion at the grassroots level. Therefore if track-I and II may be considered as superficial exercise, Track-III is more indigenous and genuine. On a human level and encounters, the general public on both sides wants peace in the region. The political division of subcontinent cut across ethnic, linguistic, cultural and religious linkages. This shared cultural heritage could be used to promote greater understanding between Pakistanis and Indians. The cultural dimension of conflict resolution strategies help to build confidence among people and find solution at the grass roots level by promoting socio-cultural interaction among the people with divergent background. An important example of Track-III diplomatic channel is Indo-Pak Peoples Forum for Peace and Democracy that is a vivid example of how without foreign funding or covert official support, the common people of the two countries can get together and discuss issues of critical importance.

It is hoped that in the environment of nuclear proliferation on one side, and the process of globalization on the other, economic and cultural relations between India and Pakistan will become more cordial. But it depends on the situation when border restrictions are slackened and peaceful bilateral cooperation between them grows on bilateral and international fora like SAARC and the World Trade Organization. Only then tensions and mistrust between the two countries will decrease. This is only possible when there is an enhanced economic activity within each nation, and political will from both sides to respect each other's existence, cultural and religious identities and a quest for more sincere and meaningful neighborly relations based on cooperation rather than antagonism.

REFERENCES

Akhtar, A. 1984. Pakistan's Nuclear Dilemma: Energy and Security Dimensions. Economic Research Unit: Karachi.

Arunachalam, V.S., and Rahul. 1999. Natural Gas Imports by South Asia: Pipelines or Pipedreams. *Economic And Political Weekly*, 34(18) May 1-7.

Bhattacharya, D. 2000. Economic Confidence-Building Measures in South Asia: Potential and Possibilities. Colombo: Regional Center for Strategic Studies. pp.35-40.

Bhusan, B. 2000. Musharraf for joint Indo-Pak Gas Pipeline from Iran. *The Daily Hindu.*

Burns, J. F. 1998. India and Pakistan hold First Meeting since A-Tests. *New York Times*, July 30.

Chari, P. R. 1999. Confidence-Building Measures in Post war South Asia. New Delhi, 29th June.

Cohen, S. P. 1983. Pakistan: The Great-Power Triangle and Asian Security. Lexington. Mass: Lexington Books.

Cohen, S. P. 1990. Solving Proliferation Problems In Regional Context: South Asia. The Aspen Strategy Group and University Press of America.

Devabhaktuni, S. Rudolph, and C. J. Mathew. 1998. Key Developments In The Indo-Pak CBM Process. The Henry L. Stimson Center. Washington D.C.

Dipankar, B. 2000. CBMs In South Asia: Potential And Possibilities. Colombo: Regional Center For Strategic Studies.

Elhas, A. and A. Moonis. 1995. Nonmilitary CBMs. New York: St. Martin Press

Federation of Indian Chambers of Commerce and Industry. 1999. Trade and Economic Cooperation between India and Pakistan. Federation of Indian Chambers of Commerce and Industry.

Ganguly, S. 1999. India: Policies, Past and Future. India and Pakistan the Fifty Years. Washington D.C. Woodrow Wilson Center And Cambridge University Press.

Haq, M. & K. Haq. 1998. Human Development in South Asia 1998, Karachi: Oxford University Press.

Harward, D. 1999. India, Pakistan agree on Security, Confidence-Building Measures. *Arms Control Today*. January-February.

Illahi, C. I. 2000. Security Challenges of South Asian Countries in the Coming Decades: An Overview, *BIISS Journal* 21(1). Dhaka: Bangladesh Institute of International And Strategic Studies.

India-Pakistan Dialogue. 1996. RGCIS Proceedings No. 11. February 5-6. New Delhi, pp.24.

International Monetary Fund. 1995. IMF Directory of Trade Statistics Year Book. International Monetary Fund, Washington. D. C.

Khan, A. H. 1995. Intra-Regional Trade in South Asia: Problems and Prospects. Pakistan Institute of Development Economics, Islamabad.

Lama, M. P. 1999. Energy Cooperation In South Asia: Issues, Challenges And Potential. New Delhi: South-South Solidarity.

LCCI (Lahore Chamber of Commerce and Industry) (2000). Import Trade and Procedure Order 2000. List of Importable and non-importable items from India. Lahore Chamber of Commerce and Industry. Lahore. pp.27-135.

Mehra, S. J. 1988. The Indus Water Treaty: A Case Study in the Resolution of an International River Basin Conflict. Natural Resources Forum 12(1).

Mangi, N. A. 1999. Pak-India Trade remains a Nettlesome Issue. *The Friday Times*. 22(22). May 28-June 3.

Moonis, A. 1993. Indo-Pak Normalization Process: The Role Of CBMs In The Post-Cold War Era, Urbana: Arms Control Program. University Of Illinois, Chicago.

Nuri, M. H. 1996. CBMs in South Asia: Practice, Problems and Prospects. *Regional Studies.* 9(2).

Qadeem, M. 1998. Internal and External Dynamics of South Asian Security. Fazleesons, (Pvt.) Ltd. Karachi, pp.82-83.

Rahul, K. 1998. Open Border for Broader Trade. *The Economic Times*. 26 October.

Rehman, A. B. 1995. SAFTA- South Asia's Key to Progress. *Pakistan Banker.* Vol. No. 1.

Riffat, H. 2001. Prospects for Peace between India and Pakistan: National Development and Security. Foundation for Research on International Development and Security. 3(35).

Rizvi, H. A. 1990. Pakistan-India Relations in the Eighties. Regional Studies. Islamabad:

SAPTA (South Asian Preferential Trade Agreement) 2001. Fourth Round of Trade Liberalization Talks. *The World Trade Review.* 1(4). Islamabad. April 15-30.

Siddiqa, A. A. 2001. The Politics of Gas Pipeline. *The Daily Dawn.* June 30.

Siddiqi, T. 2000. CBMs in South Asia: Potential And Possibilities. Colombo: Regional Center for Strategic Studies. pp.162.

Sisir, G. 1960. The Indus Waters Treaty. Foreign Affairs Reporter 9(12).

Sridharan, E. 2000. Economic Cooperation and Security Spill-Over: The Case Of India And Pakistan. Economic Confidence-Building and Regional Security, Report No.36. Washington D. C.

Sumita, K. 2000. Trends in Indo-Pakistan Relations. *Strategic Analysis.* 14(2). The Institute for Defense Studies and Analyses.

Suryanarayana P.S. 1998. India 'accepts' Pakistan's Offer on electricity. *The Daily Hindu.* New Delhi, 16 October.

The World Bank. 2000. Entering the 21st Century. World Development Report The World Bank, Washington. D. C.

Tehmina, M. 1999. Kargil Crisis and Deteriorating Security Situation in South Asia. *Pakistan Horizon.* 52(4). Karachi: The Pakistan Institute of International Affairs.

UNDP (United Nations Development Program) 1994. *Human Development Report* 1994. New York: Oxford University Press.

UNO (United Nations Organizations) 1990. Confidence And Security Building Measures In Asia. United Nations Disarmament Topical Paper. United Nations Organizations. New York.

Zaidi, S. A. 1999. Issues in Pakistan's Economy. Karachi: Oxford University Press. pp. 159.

ROLE OF ZAKAT FUND IN AN ISLAMIC ECONOMY

A. B. Basit *

1. INTRODUCTION

Zakat plays a significant role in the structure of a Muslim economy. The importance of this institution has been analyzed and discussed in a large number of academic contributions which have shed light on the various aspects of this subject. In this context Kitab-al-Amwal, is perhaps the first book that deals with Zakat system (relating Quaranic verses). Many eminent scholars have discussed the matter by covering different dimensions of Zakat. They have explored the relationship of Zakat with different economic variables at micro as well as macro level. Uthamani (1975,1972), Abdullah (1976), Ahmad (1981), Ali (1969), Attaullah (1949), Bin Baz (1969), Fatmy (1966), Masumi (1979), Rafiullah (1967) and Tasim (1972) have discussed Zakat, its rate and nisab. Din (1986), Ahmad (1965), Mawdudi (1963), Rehman (1966), Salim (1972), Islahi (1955, 1996), 1974), Hamid (1972), Kilani (1399H), have described about system of collection and distribution of Zakat. Qardwai (1981), Faridia (1980), Yousaf (1965), Rafiullah (1967), Hussan-un-Zaman (1976) have explained the expenditure patterns of Zakat, its implications on social welfare, impact on savings and investment, effect on employment and last but not the least its various uses. Nonetheless all the above-mentioned studies did not give any empirical evidence based on the attitude and behavior of the recipients of Zakat.

As such no significant empirical research has been conducted in this area to date in Pakistan. The few studies carried out on certain aspects of the Zakat system of Pakistan include Ahmad (1983), Ali (1985), Butt (1990), Khafy (1987) and Faiz (1991, 1992). The study by Faiz (1992) was concerned mainly with the evaluation of the administrative structure and monitoring of the social and economic impact of the Zakat and Usher system. Khafy has studied limited database and mainly focused his work on the managerial aspect of Zakat and Usher system. Ahmad (1983) and Butt (1990) deal with effects of Zakat and Usher on poverty alleviation. Faiz (1991) has tried to study poverty gap by taking into account the distributional aspects of the Zakat system. Malik *et al* (1994) have also highlighted similar aspect in their study that has its own significance in the literature. This study is different from earlier works in that it is based on the survey, in which, those who are entirely dependent on charity are not included.

Pakistan is facing grave problem of poverty and unemployment. Zaidi (1991, 1992 and 1993), Shirazi (1993) and Malik *et al.* (1994) Hussain and Shirazi (1994) have analyzed the role of Zakat in rural development and have found that majority of the rural population is living under poverty. A number of Muslim scholars argued that Zakat has negative effect on poverty.[1] They conclude that the Infaq fi Sabi-Allah reduced the poverty but in Pakistan many households are living under poverty line even after the introduction of the Zakat system that was

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1 See Shirazi (1993) and Malik et al. (1994)

formally established in 1980. They found that a number of households would be under poverty line if they did not receive charity.

The first shortcoming of the above analysis is that their estimation is based on the Household Income and Expenditure Survey (HIES). In this survey, those who are permanently based on charity are not included. Secondly these studies do not explain the attitudes of the recipient towards work, nor describe the fact whether Zakat distribution is providing sufficient support to the people. Thirdly these studies do not consider the direct and indirect distribution of funds. Finally the survey did not mention whether the respondents are sahib-e-nisab or not.

Theoretically the introduction of Zakat reduces the aggregate as well as structural forms of unemployment in an Islamic economy both through level of output and capital expenditure into real investment. This study has developed its framework keeping in view the preceding analysis and the problem faced by those who used HIES in their works. At the initial stage it is formulated just for the pilot survey. The main intention is to measure the attitude of Zakat recipients towards their needs and employment. We also developed a detailed questionnaire for investigation and specific questions in order to overcome problems encountered previously. For the achievement of objectives of the study, a survey was conducted in Bahawalpur Tehsil. A questionnaire was developed to help conduct direct interviews of recipients before the launch of the survey. The surveyor approached the office of Tehsil Zakat Committee Bahawalpur with a request to provide a list of all the recipients of Zakat living in the areas, which fall under its jurisdiction. The officials of the department provided a list of those recipients who were receiving Zakat of the following types;

(i) Those who have been given Zakat in Kind.
(ii) Those who are receiving net cash from Rs.100/- to Rs. 5000/- per annum.

The sample is selected under the techniques of random sampling. Seventy-one recipients in all were approached for interview, including forty females and thirty-one males.

2. SOME BASIC FINDINGS

It is interesting to note that the amount of Zakat received ranged from Rs.100 to Rs.5000/- per annum. In most of the cases the recipients did tell us about their total income. It was obvious that this amount was not sufficient to improve their standard of living but kept them above the poverty line. One aspect should be noted that the interviewers observed that living standards of the respondents were low and are unable to meet the basic requirements. Table-I depicts the pattern of amount of Zakat received.

Table 1
Amount of Zakat received By The Respondents

Amount (Rs.)	Number Of Recipient
Less than 100	---
100-200	7
200-500	36
500-1000	15.
1000-2000	9
2000-3000	3
3000-5000	1

Only two recipients reported that they had got sewing machines but they did not tell whether they have used these machines for commercial purpose or not.

Table 2
Time period of Receiving Zakat

Time period	Number of Recipient
One Year	10
1-2	32
2-3	4
3-4	9
4-5	8
5-6	2
Above 6	6

The analysis of table II brings into sharp focus the fact that only six people received Zakat more than six years, where as 42, the majority of our sample, received Zakat only for two years. One of the main objectives of this survey was to find out employment effect of the Zakat system. We analyze condition of this variable before and after receiving Zakat. From table III, one can easily see the level of employment of the Zakat recipients before receiving the Zakat.

Table 3
Level of Employment of Zakat Recipients

Level of Employment	Number of Recipient
(A) Unemployed	24
(B) Employed*	43
(i) Worker	15
(ii) Shepherd	3
(iii) Private Business	20
(iv) Tailoring	3
(v) Hair Dresser	2

* Employed does not necessarily mean any proper job.

After receiving Zakat only six recipients reported that they got employment otherwise 66 did not have proper job. Twenty-eight people reported that they tried to generate their own resources. It is worthwhile to note that their earning were not enough for their livelihood. It was clear that the amount of Zakat was not enough for the fulfillment of their basic needs.

One aspect, which is also important in this context, is the age of recipients. Table IV depicts the distribution of the age of the recipients.

Table 4
Age distribution of the Recipients of the Sample

Age	Persons
Less than 15	16
15-25	6
25-40	9
40-60	13
Above 60	27

If we consider the labour force between the ages of 15 to 60 then 43 will be excluded from the labour force and whereas in our sample two people reported that they could not do any job. 28 persons were in position to search job. Among 28, the percentage of female recipients is approximately 50%. Again in the rural areas it is important to note that among the females 65 recipients were under primary level education. This factor has significant effect on the behavior of the Zakat recipients.

It was also observed that social and economic level of the recipients is very low who strive for paid jobs. Nearly all respondents complained about the insufficient amount of Zakat. Just one person admitted that this amount was sufficient otherwise 70 persons said that this was insufficient. Only two persons were of the opinion that the system was not good when they were asked regarding collection and administration of the Zakat system.

3. SOME FUTURE ANALYSIS

Until now the prominent features of the Zakat recipients are shown by using the simple analysis based on the single characteristics of the recipients. In this section, we will try to apply the probability model for the understanding of the employment level of the Zakat recipients. One of the main conclusions in the section 2 is that employment is relatively higher in this segment of the economy because of low level of education, age, social and economic status, etc.

To further deepen the understanding about this variable, it is important to know which of the characteristics of the Zakat recipients have independent effect on the unemployment probability, and for which of these characteristics, the relationship with the unemployment can no longer be observed when other characteristics are taken into account. This may be the first step towards finding

cause of unemployment for Zakat recipients under consideration. We estimate a non-linear logit model for this purpose.

4. RESULTS OF THE LOGIT MODEL

Probability models, such as the logit model, are used to predict the probability of the occurrence of an event and identify the variables, which are significant in determining this occurrence. These Models carry a special importance in the analysis of qualitative phenomenon such as the status of employment, etc., They can reveal what characteristics of the Zakat recipients are significant in determining their employment status. The results of these models are consistent with the findings of the exercise of one-way classification, which decompose this variable across this segment. The probability models provide an improvement over the decomposition exercise since they show the effect on employment attributed to a change in a single characteristic of the Zakat recipient.

In this study, we were interested in finding out whether a change in specific characteristic of the Zakat recipient would increase or decrease the probability that the Zakat recipient is unemployed, given that all other characteristics remain unchanged. The estimated coefficient of the logit model can provide us this information. This model can be expressed as;

$$Log(P_i / I - P_i) = \Sigma B_k \, X_{ik}$$

P_i shows the probability of a Zakat recipient with certain characteristics who is unemployed, the ratio of the two terms, P_i and I-P_i will give us the odds that the Zakat receiver will be unemployed. The coefficient of each variable is interpreted as the change in the log of odds that the Zakat recipient will be unemployed given a change in the particular Zakat recipient characteristics, keeping all other characteristics unchanged. A positive coefficient would show that Zakat recipients are unemployed and vice versa.

In the following paragraphs, we will discuss the results of the model for the categorical variables based on the previous employment status, age of the recipient, gender, level of education and the amount of Zakat received. The results are found to be statistically significant at 0.05 level of significance.

The classification according to previous status of employment of Zakat recipient shows that the Zakat recipient previously employed has a lower probability of unemployment compared to the recipient previously unemployed, given all other characteristics remain unchanged. It confirms the previous result that the status of the recipients is helpful in searching the jobs. Psychologically the person who has already job in his hand can put more effort than an unemployed person (after receiving the Zakat).

The classification age of the Zakat recipient shows that the unemployment probability of a Zakat recipient who is aged between 15 to 60 years decreases significantly in comparison to recipients aged less than 15 and more than 60. The probability of unemployment falls between the ages of 15 to 60.

For the next classification, based on the gender, we find that the coefficient of the variable for the male is also significant. This implies that the male factor would independently reduce the chance of unemployment, keeping all other characteristics constant.

The education of the Zakat recipient confirms the results of the one-way classification that the Zakat recipients having primary education have a lower probability of unemployment compared to those who had less than primary education.

5. CONCLUSIONS

The main objective of the Zakat disbursement is to provide assistance to the needy so that he is able to retrieve the lost privileged position; fulfill his basic needs and employ himself and become an honorable member of the society. This study suggests that this purpose is not being fulfilled by this kind of financial assistance. A number of factors contribute to this situation, which are:

(i) The amount of distribution to the individuals is very small and even not sufficient for the fulfillment of their daily basic needs and requirements.
(ii) The recipients are not in a position to generate their own resources for employment.
(iii) The recipients with a small amount of money are left unprotected and have no guidance from the authorities.
(iv) The effect of age is very much prominent.
(v) The level of education also affects their level of employment.

6. AN ALTERNATIVE SOLUTION

In view of this situation, it is essential that the recipients should be provided moral encouragement, systematic and consistent training, feedback and permanent institution which could protect and take interest in the wake of indifferent, repulsive and aggressive socio-economic conditions of the economy. It is better to treat poverty indirectly via a strong and efficient economy than direct hand-to-hand disbursement of Zakat.

The funds of Zakat can be used for the establishment of the small firms based on the appropriate technology. The labour intensive facilities can be another use of Zakat funds, which may lead to increase in the aggregate demand.

The provision of the education is also an important factor which would be helpful in the provision of the economic and social status of the Zakat recipients.

Since this is a pilot study, it is one of its weaknesses. But the findings of this study will help us to develop a comprehensive plan later on to analyze the trends explained in the paper.

The contribution of this study is that it uses probability model to determine the Zakat recipient characteristics, which are significant in the determination of the employment status of the recipients. Thus the model is an improvement over the one-way classification in which we use only a single characteristic of the recipients to differentiate the status of employment.

REFERENCES

Abdullah, S.M. (1976), "Zakat and Poverty", Voice of Islam, Karachi 24(4): pp. 194-98.

Abu Zahra, M. (1965), "The Zakat", Second Conference of the Academy of Islamic Research Al-Azhar, Cairo pp. 123-65.

Ali, M. G. (1968), "Naqad Sarmaya Ki Zakat Aur Us Ka Nisab" (Zakat on Cash and Its Nisab) (Urdu), Tarjmanul Quran, 60(1): pp.56-60.

Ali, M.G. (1963), "Zakat-o-Sadaqat Ka Nizam" (The system of Zakat and Sadaqat) (Urdu), Tarjamanul Quran, 60(2): pp.114-117.

Attaullah, S. (1949), "Revival of Zakat", Lahore: Rippen Printing Press, pp. 110.

Bin Baz, A. A. (1398 AH), "Zakat Ke Masa'il –o-Ahkam" (Some Problems Related to Zakat) (Urdu), Lahore: Muhaddit 8(7).

Chaudhary, M.A. (1986), "Contribution to Islamic Economic Theory", London, Macmillan Publications, pp. 51-71.

Faridia, F.R. (1980), "Zakat And Fiscal Policy", Studies In Islamic Economics, Khurshid Ahmad (ed), Leicester: The Islamic Foundation, pp. 119-30.

Faridia, F.R. (1980), "Theory of Fiscal Policy in an Islamic State", A paper presented in international Seminar on Monetary and Fiscal Economics of Islam, Islamabad.

Goraya, M.Y. (1980), "Zakat Aur Us Ka Nafaz" (Zakat and its Implemention) (Urdu), Fikr-o-Nazar, Islamabad 18(2): pp. 17-30.

Hassan, H. H. (1995)," Zakat: the Right to social security ", Islamabad: Da' wah Highlight.

Hassanuzzaman, S.M. (1981), "The Economic Function of the Early Economic State", Karachi: International Islamic Publishers.

Hashimi, S.A. (1980), "Zakat as an Instrument of Fiscal Policy in Economic System of Islam", Karachi: National Bank of Pakistan, pp. 340-54.

Hussain, M. and N. M. Shirazi (1994), "Role of Zakat and Usher in Rural Development, A paper presented in a seminar on Rural Development in Islamic Perspective, International Institute of Islamic Economics, Islamabad.

Ishaque, K. M. (1972), "Problem of Taxation: It's Islamic Solution", Muslim News International, 11(2): 23-6.

Ishaque, K. M. (1972), "Problem of Taxation: Its Islamic Solution", Muslim News International, 11(3): 13-16.

Ishaq, M. K. (1967), "Talimul-Zakat" (The Teaching of Zakat) (Urdu), Lahore: Idara ishaat-us Sunnah, pp.88.

Islahi, A.A. (1955), "Mas'ala-e-Tamlik Aur Zakat Ke Mutalliq Ba'd Dusre Masail" (Transfer of Ownership), Lahore: Tarjuman-ul- Quran, 44(6): pp. 395-410.

Islahi, A. M. (1974), "The Role of Al-Zakat in Islamic System of Economics in Curing the Poverty", Third National Seminar, AM.S.S, Gay, Indiana, USA.

Kahaf, M. (1981), "Taxation Policy in an Islamic Economy" A paper presented in International Seminar on Monetary and Fiscal Economics of Islam, Islamabad.

Khan, H.M.A. (1972), "Islami Nizam-e-Ma'ishat Ke Liye Ghaur Talab Masail" (Some Problems Relating to Islamic Economy) (Urdu), Lahore: Islami Ta'lim, 1(1): pp.42-63.

Kilani, A.R. (1399H), "The Role of Infaq in Poverty Alleviation in Pakistan", A paper presented in the Tenth Annual General Meeting of Pakistan Society of Development Economics, Islamabad.

Masumi, S.H. (1979), "Zakat Aur Sadaqat Ke Auzan Aur Muqadir" (Weights and Measures of Zakat and Sadaqat) (Urdu), Tarjuma-ul-Quran, 92(2): pp.65-70.

Matwally, M. M. (1981), "Fiscal Policy in An Islamic Economy", A paper presented at the International Seminar on Monetary and Fiscal Economics of Islam, Islamabad.

Mawdudi, A.A. (1963), "Tijarati Hisas Aur Kiraya Wali Asya Ki Zakat" (Zakat and Share Stock and Assets Meant for Rent) (Urdu), Trajman-ul-Quran, 59(5): pp.304-9.

Mawdudi, A.A. (1954). "Zakat Sey Mutallaq Chand Tashrihat" (A Few Clarification's about Zakat) (Urdu), Tarjmanul Quran, 42(6): pp. 408-13.

Qadir, A. (1981), "Comments on Fiscal Economics", A paper presented at the International Seminar on Monetary and Fiscal Economics of Islam, Islamabad.

Qardawi, Y. (1982), "Fiqhul Zakat", Vol. I &II, Lahore: Al-Badar Publications.
Raffi Ullah, A.S. (1967), "Kiya Zakat 'Ibadat Hai Ya Tax?" (Is Tax an Ibadat or a Tax) (Urdu), Fikr-o-Nazar, 3(11): pp. 561-80.

Rehman, F. (1966), "Maqadar, Nisab-e-Zakat" (Exemption Limits of Zakat) (Urdu), Tarjanul-Quran, (78(2): pp.88-92.

Salama A.A. (1981), "Fiscal Policy of an Islamic State, A paper presented in the International Seminar on Monetary and Fiscal Economics of Islam, Islamabad.

Shas, S. Y. (1968), "Zakat Ke Musarif (Head of Zakat Expenditures) (Urdu), Fikr-o-Nazar, 5(12): pp. 917-27. .

Sharizi, N.S. (1993), "An Analysis of Pakistan's Poverty Problem and its Alleviation through Infaq", A Ph.D. Dissertation, International Islamic University, Islamabad, Pakistan.

Saddiqi, M. I. (1972), "Machinoon Par Zakat Ka Mas'alah" (Zakat and Machinery) (Urdu), Bayyinat, 20(4), pp 19-32.

Saddiqi, M.I. (1986), "Public Expenditure in an Islamic State", A paper presented in the International Seminar on Fiscal Policy and Development Planning in an Islamic State, Islamabad.

Tasin, M. (1972), "Machinon Par Zakat Aur Fiqh-e-Hanafia" (Zakat on Industrial Capital and Buildings) (Urdu), Bayyinat, 21(3).

Tasin, M. (1967), "Sanati Sarmaya Aur Imarat Par Zakat" (Zakat on Industrial Capital and Buildings) (Urdu), Fikr-o-Nazar, 4(7): pp. 435-48.

Uthmani, M.R. (1975), "Rihaish mankan ke Liye Jama Ki Hui Raqam Par Zakat" (Admissibility of Zakat on the Money Saved for Building a House) (Urdu), Karachi: Al-Balagh, Karachi.

Uthmani, M.R. (1972). "Kiya Sharh Zakat Main Tarmim Ho Sakti Hai?" (Is the Rate of Zakat Alterable?) (Urdu), Al-Balagh, Karachi.

Book Review:

The Pakistan Poverty Assessment Poverty in Pakistan: Vulnerabilities, Social Gaps, and Rural Dynamics, October 2002. Published by the World Bank.

This report analyses the poverty trends and their fundamental causes in Pakistan for the 1990s. It identifies major weaknesses for social sector development, which is a key to eradicate poverty, in the country. It highlights critical areas of concern which the government needs to incorporate in its policies to restructure and reform the economy.

The report says that one third of the population of the country is living below poverty line, with even a greater proportion in rural areas. Pakistan's social indicators are very poor when compared with countries at the same level of development and reflect wide regional, urban/rural and gender disparities. The variance of social indicators between the rich and poor is also a prominent feature of social gap, which has highlighted in this report. The report says that the primary gross enrolment rate among top three deciles, by per capita consumption, are around 90%, whereas among the bottom three deciles is around 50%. One of the major reasons for this is the failure of public service delivery by the government. The poor are disproportionately affected partly because of their inability of choice between the public and private sector and partly because of loss of interests and their reduced dependence on public services.

The report depicts that low levels of literacy, poor health standards and inadequate public infrastructure for these social services are the main factors hindering human development in the country. It identifies two main reasons for this situation. The first is the skewed incentives of the non formal parameters, i.e. the political competition in rural areas which hold back elected representatives to ensure smooth public service delivery. Secondly there are social taboos which discourage females from getting education as a result of which demand for these social services have fallen in rural areas.

In addition, the low and inefficient patterns of social spending enhance the magnitude of poor human development adding to the miseries of the people. Punjab, which constitutes 60% population of the county, is a macrocosm of the social gap afflicting people. According to a recent World Bank study of local public expenditure, the province's dismal social conditions stem from low spending on the social sector and inefficiencies in the use of these limited resources.

The province spends 2.1% of the provincial GDP on education. It is only about half the share allocated by countries with similar income levels and about two thirds of what is spent by India and Sri Lanka. The government has failed to properly utilize even these meager resources. It was envisaged with Social Action Program, average real spending per student will go up, but estimates

showed that it remained stagnant in the 1990s. More than 90% of the elementary budget is spent on non-development expenditures leaving very small amount of resources for spending on other teaching materials. Moreover the inability of the school management committees to utilize funds earmarked for this purpose has also resulted in under utilization of already meager resources set aside for improving state of education in the province.

Similarly funds allocated for improving health standards are also very low. The province spends around .5% of its GDP on health which are not sufficient compared to regions of other developing countries which earmark 2% of their GDP for health expenditures. Like education, the hospital runs out of necessary medicines and other medical supplies owing to insufficient amount for non-salary components. In some cases it has been noted, for example in the year 1999, half of primary health care institutions reported complete exhaustion of three essential drugs from the stock.

The devolution of power plan being implemented by the government has been introduced with the objective of providing effective delivery of municipal and other social services to the people. It envisages enhancing standard of living of the people by empowering them at the local level in an effort to mitigate the adverse effects of centralized governance. The system holds out possibilities of immense improvement in the public service delivery since the people at the helm of the affairs in the three tiers of governance will be able to identify and prioritize their own needs according to their own local socio-economic conditions.

The report also highlights three critical areas of intervention which the policy makers should incorporate in the poverty reduction strategy. The absence of *social protection* enhances people's vulnerability in both rural and urban areas. It has increased social disparities particularly in the fields of health and education. This in turn calls for policies and programs to engender *human development.* All this can be done through a *well coordinated strategy* giving due emphasis to both urban and rural population.

The mechanism which provides social protection is the distribution of Zakat among the people, but having very insignificant bearing on their lives due to low aggregate transfers. Zakat which constitutes .2% of the GDP is not expected to change economic fortunes of the people quickly. The situation is further aggravated because of political patronage at the local level, which results in poor target setting, depriving people really deserving it.

The government has launched various public works programs like Khushal Pakistan Program and micro finance which offer considerable opportunities to improve their living conditions by raising their level of production as well as productivity. However for the long term sustainability of these programs the government should establish links between such mechanisms and formal institutions under the supervision of a regulatory authority like the State Bank of Pakistan. At the same time it should also not ignore the needs of the urban

people, which are suffering because of rising population, lack of housing and other civic amenities.

Secondly the government needs to strengthen institutions concerned with delivery of public services if it is to improve human development conditions in the country. The experience of SAP clearly reflects that there will not be any tangible improvement unless governance structures are improved and reformed to ensure complete accountability and transparency. The program has resulted in some improvements but it has failed to create a mechanism of accountability which could ensure delivery of quality services to the people.

In the final analysis, the report calls for broad based and integrated policy approach to eradicate poverty from the rural as well as urban areas. It clearly sets out that if the country fails to bridge social gaps, its ability to grow economically, eradicate poverty and retire its crippling debts will be severely undermined. It is in this context that the report highlights the issues of governance and lack of accountability and transparency which if properly addressed can result in poverty alleviation.

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