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Poverty and Natural Resource Management in Pakistan

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Pakistan is a country of contrasts, with diversified relief having majestic high mountain ranges snow-covered peaks, eternal glaciers, and the inter-mountain valleys in the north. Irrigated plains in the Indus basin contrast with stark deserts and rugged rocky plateaus in southwest Balochistan. The country is arid and semi-arid with substantial variation in temperature depending upon the topography and characterised by continental type of climate. Over the years since independence the natural resources of the country (land and water) have been harnessed which in turn made it possible to feed the growing population which more than quadrupled during the past sixty years. Construction of Tarbela and Mangla Dam facilitated the growth of irrigated agriculture and led the cropping intensity to peak. Sectors other than the agriculture also developed because of the backward and forward linkage of the agricultural growth thereby having an economy diversified and much less dependent on agriculture.

There are however concerns raised with respect to the costs and practices of the past development in terms of environmental degradation, resource misuse and depletion. One fourth of the country's land area, suitable for intensive agriculture suffers from wind and water erosion, salinity/sodicity, water logging, flooding and loss of organic matter. Deforestation has taken its toll as the accelerated surface erosion is shortening the life of Tarbela and Mangla reservoirs, which provide water for 90 percent of the food and fibre production in the country. Over-exploitation and misuse of rangelands extending over a vast area are seriously constraining livestock production, thereby adversely affecting the livelihood of pastoral communities. The mangrove areas are under increased environmental stress.

Overexploitation and misuse of the resources by the population in the context of the development has not been fully reckoned by the researchers as well as the policy makers. Given the fact that healthy ecosystems produce the requirements for life which in turn highlight the crucial linkages between the society and eco-systems. The complex relationships between management of natural sources and survival strategy of poor are not fully examined and investigated in Pakistan. This is despite the fact that poor rely more on natural resources than the rich. Unfortunately few, if any, research endeavour in Pakistan has been conducted to unravel the nexus between the poverty and natural

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resource management. This is not to suggest that the environmental degradation and threatened biodiversity is glossed over. In fact it is the opposite wherein relevant organisations and ministries are continuously assessing these changes. What needs to be highlighted is that the poverty reduction and resource management have not been examined in an interdependent framework of environment, development and population growth. This in turn would have led to mounting of various case studies focusing upon these interlinkages. Exclusive focus of the development agenda on attaining the UN Millennium Development Goals as well as ensuing WB Poverty Reduction Strategy Papers tended to relegate the importance of the examination of crucial links between resources management, environment and poverty reduction to the secondary position wherein monitoring and estimation of poverty levels as well as the safety nets to address the casualties of growth in the context of globalisation appears to have been accorded priority for research and evaluation exercises as well as data collection.

In this exercise an effort is made though in a limited way because of the lack of requisite data to fill this void. Poverty levels and trends for the country and the rural urban regions are described in the first section of this report, which is followed by a discussion of the overall economic growth (GDP) and its distribution to discern its impact on poverty situation. The relationship between the utilisation of major natural resources of the country the land water, poverty is studied in the third section wherein the mapping of poverty to different agroclimatic zones is attempted. Sources of income by poverty status controlling the other variables are discussed in the fourth section. The role of agricultural in poverty reduction is also assessed discerning the poverty levels in the fifth section. The final section rounds up the discussion as well as offers some suggestions for data collection to sharpen our understanding about the interlinkages between poverty and resource management.

I. POVERTY PROFILE

Multidimensionality of poverty defies a neat demarcation. Often several but not separable meanings can be attributed to poverty which essentially should encompass totality of deprivation experienced by an individual or group of individuals. Encyclopaedia of Social Sciences for instance, suggests that definition of poverty is convention specific and distinguishes between Social Poverty and Pauperism. The former includes economic inequality or property incomes etc in addition to social inequality such as dependence or exploitation while Pauperism denotes ones inability to maintain at the level conventionally regarded as minimal. Pauperism has been the focus of researchers in Pakistan and elsewhere in the developing world, wherein efforts have been made to quantify the poverty, thus defined, using essentially arbitrary poverty lines or norms with application of varying procedures for estimation. During the past variety of procedures were used. Planning Commission of Pakistan however in 1998-99 suggested an official poverty line in terms of minimum caloric requirement per adult (2350 per day) and the needed expenditure of Rs 670 per person for that year. Despite the need to demonstrate the relevance of this caloric requirement the constructed poverty line can facilitate monitoring the poverty levels in the country which has assumed importance given the global emphasis on MDGs and Social Safety Nets.

There is almost a consensus that in an historical perspective Pakistan was successful in reducing poverty over the decades since independence. Absolute poverty, Head Count ratio based on caloric intake, declined from 46.5 percent in 1969-70 to 17 percent in 1987-88. Since then the reversal has taken place till 2001 when it rose to 34 percent. Recent research exercises for the period since 2002 are suggestive of improvement, according to the Government—around 10 percent point decline in poverty incidence, which is contested by independent researchers including the WB which claim that poverty level may have declined from 34 percent in 2001 to 29 percent in 2004-05 It is extremely difficult to offer a firm conclusion about the current poverty levels in Pakistan but the official claim of 10 percent point decline during the three years period must be supported by other indicators such as sharp rise in real wages, massive reduction in the inequality and unemployment rates. The general impression as well as our findings is that these variables fail to support the official claim.

For the period since 1998 three different estimates are presented in Appendix Tables 1, 2, and 3. Along with the official estimates which suggest a 10 percent point decline in the poverty from 34 percent in 2001-02 to 23 percent in 2004-05, the estimates from the World Bank which uses Survey based price index rather the official CPI and Jamal (2007) who estimates Calorie Consumption Function (CCF) and provides a longer time trend, however indicate that the poverty in the latter year declined to 30 percent. Jamal also suggest that the rural/urban gap in the poverty level has narrowed, in other words poverty decline was larger in rural areas than in urban areas, the result different than the other two exercises. Juxtaposition of these three studies is suggestive of at best a stagnation of the poverty levels with a quantum jump in 2001-02 because of drought particularly in Sindh province and then reversals in the poverty trend to 1998-99 levels also in the same province. The official claim of drastic curtailment in poverty levels in 2004-05 to 24 percent merits further scrutiny. It may be added that around 10 percent of the households lie within the range of ±5 percent of the poverty line, hence a minor change in the poverty line, inflationary adjustment and data protocol procedures can generate substantial variations in the estimated incidence of poverty.

Regional and Provincial Poverty Incidence

Invariably all the research exercises on estimation of poverty concur that poverty levels are higher in rural areas than in the urban (see Tables 1, 2 and 3). Given that the rural population accounts for two thirds of the total, majority of the poor live in rural Pakistan and poverty is a rural phenomenon. According to the official estimates the head count ratio of poor in rural areas is almost double of the urban areas in 2004-05. The World Bank study suggests also similar magnitudes of the rural urban gap, though Jamal differs on the gap between urban and rural areas. These research exercises suggest that poverty is predominantly a rural phenomenon because two-thirds of the populations live in rural areas.

Provincial Poverty Profile

Four provinces, mostly defined on the basis of ethnicity which also coincides with natural resource endowments often classify the country. Thus Punjab and Sindh provinces have rich agricultural resource base as well as both are more developed compared to resource

poor and less developed provinces of NWFP and Balochistan. The provincial poverty picture is depicted in Appendix Table 4. Application of care is counseled in the interpretation of data because the HIES data are not regarded as representative at the level of province. Two estimates, one from the World Bank and the other by Anwar (2006) provided in the table are indicative of the findings that in general poverty incidence at the provincial levels tend to fluctuate. While Balochistan was least poor in 1998-99, a status acquired by Punjab in 2001-02 and Sindh in 2004-05. Further classification in terms of urban and rural areas tends to suggest that the urban Sindh emerged to be the least poor for all the three years under study. A closer perusal of the table also indicates that improvement in poverty situation was mostly confined to Sindh province during 2001-02 to 2004-05, the other provinces did not share this gain rather the situation in Balochistan province worsened during the same period.

Poverty Incidence at Disaggregated Levels

To a large extent the dichotomy of urban and rural areas fails to reckon with the continuum obtained at ground. Rural areas are integrated with nearby urban centres because of both the factor and product market interdependence. Similar interlinkages exist between small towns and major urban centres. In other words, neither the urban areas nor the rural areas are homogenous units. Urban areas include major towns and small towns. Based on household level (raw data) one finds that the major urban centres (classified by Federal Bureau of Statistics as self representing because of large population sizes and the provincial capitals) are in a very comfortable situation where the poverty incidence (using official poverty line) in 2004-05 was only 9.7 percent. In contrast the other urban areas were closer to rural areas where the percentages of poor were 22.1 percent and 28 percent respectively. Within the rural areas non-farm population was worst hit by registering 34 percent poor as compared to 23 percent of the population of farm households. In terms of the provincial comparison substantial differential persists wherein major urban centres of Sindh appear to be least poor (6.2 percent) compared to 20.6 percent of NWFP. In an overall comparison, NWFP can be regarded as the most poor (see Appendix Table 5). Major urban areas particularly in Sindh and Punjab provinces were the ones which experienced industrial and commercial development, hence a lower level of poverty is plausible. The above disaggregated description of poverty incidence is indicative of the close similarity between rural areas and small urban areas. The latter appears to be the extension of the former with mushroom growth of less productive informal sector enterprises.

II. GDP GROWTH AND POVERTY

Admittedly, overall economic growth has a direct bearing on poverty level in a country, however, Pakistan's experience reflects a dissonance between these two for some periods during the past sixty years. For example, high growth period of 1960s is associated with a decline in poverty only in urban areas. In rural areas, the poverty situation worsened. During the next decade, GDP growth rate was lower than the previous one but level of poverty declined though the evidence is sketchy. During 1980s, one finds a straightforward and expected relationship between GDP growth rate and poverty levels wherein the poverty situation improved while the economy registered a remarkable growth rate. During the 1990s the poverty situation worsened, being 24.9 percent in 1992/3 to 32.1 in 2001, because of low and erratic growth profile, in addition to other socio-economic and political factors. The

decline in GDP growth continued till 2003, a period associated with strict implementation of Stabilisation and Structural Adjustment Programme. Since 2003 the economy appears to have a turn around by registering roughly 6 percent GDP growth rate during the past five years.

A perusal of research studies conducted over the years reflects that in addition to growth there were some important determinants of poverty situation. For instance, high growth rate of 1960s failed to reflect any improvement in the poverty situation in rural areas because of the eviction of tenants and rise in landlessness [Irfan and Amjad (1984)]. In the wake of subdued economic performance of the early 1970s, a decline in the poverty level was made possible through escalation in the public sector employment and a massive rise in public sector expenditure [Zaidi (1995)]. Similarly, Middle East emigration and return flow of remittances had a positive influence on GDP growth as well as poverty till late 1980s. In other words, Pakistan's experience suggests a very close link between employment generation, remittances and tight labour market and poverty. To the extent the improvement in poverty situation during 1970 and 1980s occurred because of the policies and measures resulting in huge budget deficits and mounting indebtedness, these represent inter-generational poverty shift, wherein future generations have had to pay back what was borrowed for sustaining as well as inflating the consumption level of current generation.

The slippage of the economy into debt trap around late 1980s and reduction in the foreign aid due to Pressler Amendment, in fact put a halt to the past practices wherein the entire development expenditure and occasionally the current expenditure used to be financed by internal and external borrowing. In order to rectify the internal and external imbalances through curtailing expenditure, raising revenues and better export performance under IMF/World Bank reform packages, the economy was subjected to a discipline. Pakistan agreed to implement various structural adjustment and stabilisation programmes. It is in this context that four programmes beginning with 1987-88 were signed by the Government of Pakistan for implementation. With the exception of the last 1999-2003, there were implementation lapses. Pakistan has been successful in attaining macroeconomic stability by implementing SAP during 1999 to 2003 though at the cost of subdued economic performance, squeeze of the development expenditure and worsening poverty which was also compounded by the erratic weather conditions adversely affecting the growth in agriculture, the major sector of the economy.

The deterioration of the poverty conditions in the country in the context of Structural Adjustment Programmes during the first five years of the current regime was due to a number of factors which explain poor economic performance as well as worsening poverty situation in the country till 2003.. For instance, decline in the GDP growth rate has been attributed to low level of investment and lack of effective demand occasioned by the squeeze entailed by massive reduction in the public sector expenditure to address the problem of budget deficit. Furthermore the failure of the state to bring the rich into tax net rendered the taxation structure regressive wherein the poor were subjected to a disproportionate burden. Similarly, the withdrawal of input subsidies in agriculture sector along with provision of international prices to producers benefited only those who had marketed surplus in the agriculture sector which also explains the failure of growth in agriculture during 1990s to have a positive influence on the poverty in rural areas. Parenthically it may be added that the growth rate in agriculture is alleged to be an overestimate for 1990s.

In addition the inequality in the economy increased wherein the Gini index rose from 0.26 to 0.30 according to Federal Bureau of Statistics during 1997-98 to 2001-02 (see Appendix Table No. 6). A decomposition exercise suggests that growth effect for 1998-99 to 2001-02 in fact added to poverty while redistribution effect was negative. For recent sub-period 2001-02 to 2004-05, it was the redistribution effect which was positive and added to poverty levels while growth effect was negative (see Appendix Table 7).

The conjunctive influence of tariff rationalisation, financial sector reform and privatisation led to closure of factories and downsizing which in turn resulted into substantial job losses. It may be added that poverty related expenditure of the government drastically reduced as a percentage of GDP during the decade of 1990s till 2003 thereby crucifying the poor at the alter of macro stabilisation. The labour market outcome as indexed by rising unemployment rate and stagnant or declining real wages also an offshoot of these measures, further compounded the situation.

Whilst the above mode of analysis provides explanation for rise in poverty during 1990s and till 2001-02 there is also a need to disentangle the effect of structural adjustment from the inherent limitation of the overall dispensation of the country. Failure of investment to rise, the basic factor which explains low growth, can be attributed to the inconsistency of the policies along with law and order situation and misgovernance but cannot be regarded as the off-shoot of the structural adjustment program. Similarly, massive reduction in public sector expenditure during 1990-2003 is more a failure of the state to generate resources because of the particular compositional specifics of the society than an effect of the transition of the economy under the structural adjustment. Obviously, there is a need to mount more investigative pursuits with a view to understand the given constellation of the power brokers in the country and their impact on the poor, through the choices they make. The influence, which the corruption and related governance problem bear upon poverty and inequality are not explored as yet.

Turnaround of the economy during the recent sub period (2003–2006) spurred by domestic demand escalation wherein the government patronised the automobile industry ignoring the attendant costs of congestion, environmental degradation and worst of all the conspicuous consumption as well as rising import bill. The GDP growth of 6 percent per annum has been registered which may have led to the decline in poverty and little bit of unemployment too, but income inequalities have not only persisted but increased. Inflow of funds from abroad due to geo-political factors and remittances facilitated the government to expand public sector spending thereby having positive effect on poverty situation since 2003.

Short term prospects of the sustainability of the GDP growth are not bright. The high inflation rate, widening current account deficits, sluggish export performance, besides failure of the regime to increase tax to GDP ratio and national savings are the worrisome factors. Studies conducted in the Growth Diagnostic Framework of Hausseman identify the lack of governance as major constraint to future growth [Qayyum (2007)]. Studies which opted neoclassical growth accounting tend to allude to the low domestic saving a major bottleneck to future growth [Din (2007)]. It may also be added here that Total Factor Productivity (TFP) reflecting the efficiency of the growth process appear to have declined over the decades.

An intriguing fact of the history is that Pakistan was successful in reducing the poverty level during the periods when the country received massive funds from abroad (1960s, 1980s and 2000-2006). It is also not a coincidence that during these periods the country was under the non democratic dispensation. In other words whatever the poverty alleviation occurred was not indigenous and hardly enmeshed with the dynamics of growth, distribution and resource management issues a characteristic of self reliant growth strategy. If one were to ignore the high growth episodes of 1960s associated with cold war, 1980s an era of Afghan war and since 9/11 war on terror, the natural growth rate of Pakistan's economy works around to 3 to 4 percent per annum hardly keeping up pace with population growth. Funds from abroad supplemented the low domestic saving and permitted high level of investment needed for higher growth rate. Also during these high growth episodes, PSDP as fraction of GDP rose to have a positive influence on poverty situation.

III. POVERTY AND NATURAL RESOURCES INTERLINKAGES— STUDY OF AGRO-CLIMATIC ZONES

In order to discern somewhat the connectivity between poverty reduction and natural resource management, poverty incidence and sources of income of the poor by agroclimatic zones are discussed in this section. Pakistan being endowed with diversified relief exhibits varying cropping pattern depending on water availability and type of the soil. Mountainous areas of NWFP, Balochistan and some parts of Punjab are generally considered as non-irrigated areas, where crops like wheat and maize are grown. In the irrigated areas in the northern Punjab generally basmati rice, wheat combination is opted. In Southern Punjab and parts of Sindh cotton/wheat rotation is practiced. In southern Sindh, exclusively Irri rice is grown. Similarly, sugar is exclusively grown in some irrigated areas where water availability permits. The extent to which the spread and depth of poverty varies with the different crops which embody differential mix of natural resources is provided in the Appendix Table 8 wherein Punjab and Sindh provinces are divided into agroclimatic zones whereas Balochistan and NWFP are treated as distinct units. Poverty incidence on the basis of 2004-05 HIES separately worked out for urban and rural areas in each zone are suggestive of an interesting result that the agriculturally rich zones like wheat cotton Punjab and Sindh appear to be poorer than the remaining areas in these provinces. Rankings on the basis of poverty incidence puts the Barani (non-irrigated) Punjab at the top registering only 7 percent of the population being poor whereas those residing in wheat/cotton zones of Punjab and Sindh exhibited 33 percent and 23 percent poverty. These findings are similar to a previous study conducted by Malik (2005) using 2001-02 data.

Urban-rural poverty incidence in different zones finds a close association rendering homogeneity to zonal classification in the Punjab province but exhibits wide disparities in Sindh where rural areas of a given zone happen to be much poorer than their urban counterparts.It may be noted that Pakistani agriculture reflects a coexistence of peasant proprietorship in barani and northern Punjab and feudalistic structure typified in Southern Punjab and Sindh. The distribution of land is substantially skewed with overall Gini coefficient being 0.66. According to Agricultural Census 2000 only around one-thirds of the rural households owned land with most of them (61 percent) having land less

than 5 acres. On the other hand, two percent of the households at the top owned 30 percent of land. And this land inequality gets translated into income inequality and higher level of poverty among the sharecroppers and tenants among the farm population in an otherwise rich agricultural regions of Punjab and Sindh. Whilst Balochistan and NWFP account for 18 percent and Barani Punjab accounts for 6 percent of total population, nearly three-fourth of the population reside in areas having irrigated agriculture. In those areas where the feudalistic structure persists accounting for over 25 percent of the rural population fail to get out of poverty because the major share of output is appropriated by landlords as returns to land are over 50 percent.

Barani or non-irrigated Punjab which yielded the lowest levels of poverty has benefited from diverse developments which led this area to relative prosperity. Prior to independence the British Empire provided military and other jobs disproportionately to this region. This was the beginning of the road to relative prosperity in these areas because the empire also built hospitals, schools and initiated other development activities. This low level of poverty of non-irrigated Punjab is also associated with lower family sizes and better human capital assets. Furthermore, because of the location of capital of country Islamabad, headquarters of all the three branches of Armed Forces and host of other industrial activities, the area is well developed though not having vast irrigated lands.

Farm vs. Non-farm Population

Within rural areas, the distinction between farm and nonfarm gets blurred because factor and product markets are interlinked. In the rural Pakistan nonfarm population appears to be much poorer than the farm population. While 36 percent of the nonfarm population according to HIES 2004-05 is poor the corresponding percentage for farm population is 22. In urban segments of the zones, however, the incidence of poverty on farm population is higher than on the non-farm. The reasons are obvious because in the urban areas the non-farm population is better educated and skilled than the farm population (see Appendix Table 9).

IV. SOURCES OF INCOME

Investigating the dependence of rural as well as urban poor on different income sources allude to the importance of various factors bearing upon the poverty outcome. According to the Household Integrated Economic Survey 2004-05, wages and salaries are the single largest sources of income accounting for 30 percent of the total income. This is followed by other activities which presumably comprise of enterprise income and account for 24 percent of the total. Crop and livestock product together occupy the third position in this ranking yielding 20 percent of the total household income. The share of livestock income in total income is much less than what is suggested by National Income Accounts, presumably the latter is overestimated as suspected by some researchers [Malik (2005)]. Nearly 8 percent of household income is accounted by domestic and foreign remittances. Sources of income differ across rural/urban divide, by agroclimatic zones and by land size classifications. For instance, wage income is 23 percent of total in rural areas as compared to 38 percent in urban areas. Similarly, crop and livestock income accounts for 32 percent of total household income in rural areas in contrast it

works out to 3 percent in urban areas. Remittances constitute of 9 percent of total income in rural areas as compared to 6 percent in urban areas. Stark differences exist in the share of other income presumably the enterprise income being 31 percent in urban areas and 17 percent in rural areas.

Sources of income controlling for agroclimatic zones is indicative of the fact that the least poor zone (Barani Punjab) and NWFP derive substantial portion of the income from domestic and foreign remittances being 12 percent and 13 percent respectively. In contrast the dependence of these zones is the lowest on crop and livestock (9 percent of the total). Wages as a source of income are also above average in these zones (see Appendix Table 10). Crop and livestock income accounts for 31 percent or more of the household income in cotton wheat Punjab and Sindh, low intensity Punjab and in Balochistan. Non-farm income accounts for 20 percent household income in nearly all the regions with national average being 26 percent. In terms of poor/non-poor divide the dependence of poor on wage income is higher than the non-poor, particularly in Barani areas, cotton wheat Punjab and Sindh as well as in NWFP and Balochistan.

In terms of land size classification the role of wages is larger among the landless and gradually declines as one moves up the land size (see Appendix Table 11). The remittances account for 12 percent f the household income for small land holder (1 – 2.5 acres) thereby these decline to 5 percent for the large size landholders (25 acres and above) Crop and livestock income acquires significance for all the categories of 5 acre and above where it accounts for over 40 percent on the average and over 57 percent for the largest land size (25 acres and above). Interestingly, the share of the nonfarm (or enterprise) income is the highest 33 percent for landless to be followed by small holders (1 – 2.5 acres) 22 percent. For the remaining land holders the enterprise income accounts for less than 15 percent of the total.

Clearly, the role of different sources in the household income depict the survival strategy of the population in rural areas. Ex-village and off-farm labour market participation represents a response to lower level of crop and livestock income either due to paucity of the land resources or land concentration among the few hands as is the case in Southern Punjab and Sindh rural. Non-farm (or enterprise) emerges to be more important for landless and small holders who supplement their income through engagement mostly in low productivity informal sector.

V. ROLE OF AGRICULTURAL GROWTH

Notwithstanding the fact that the contribution of agriculture to GDP is around 20 percent, the totality of the impact of the growth in agriculture sector is immense. This is because of its backward and forward linkages effect. Even today, 70 percent of Pakistan's exports are based on agricultural produce and nearly two-thirds of the population is directly or indirectly dependent on agriculture. Large scale surface irrigation was undertaken in the 19th century and subsequent major projects like Tarbela and Mangla Dam were completed after independence. Since then the developments taking place in the agriculture sector provided a strong foundation to the development of the economy. Real GDP growth in agriculture was the highest in 1960-70 (4.8 percent). Then again during 1980-2000, the growth was ranging between 4 to 4.4 percent. Since the year 2000, it declined to 3.5 percent. During the more recent period of 1998 to 2004-05, the

agricultural growth in per capita terms after adjusting the official population growth rate [World Bank (2007)] was negative (–1 percent). This to a large extent explains the weak link between poverty levels and agricultural growth, because the latter was not sufficient as well as it has been erratic exhibiting year-wise fluctuation. The sector depends to a large extent on the production of major crops like wheat and cotton. The latter being produced in Southern Punjab and Sindh where land distribution is highly skewed thereby one gets an anomalous findings that agriculturally rich zones are associated with highest levels of poverty.

Agricultural growth during the period of Green Revolution (1970 to 1980) was mostly input based (seeds, fertiliser and water). Since the early 1990s, the total factor productivity in crop sub-sector appears to have remained stagnant or declined. Deterioration in water and soil quality since 1990s is also reported. In order to achieve perceptible growth in the farm sector, measures are needed to address the declining soil fertility in many parts of the country. According to the World Bank (2007) study, around Rs 70 billion per year or 6.8 percent of agricultural GDP is lost due to soil degradation attributable to inefficiency in water use. It is also imperative to diversify and venture into high value crops wherever appropriate. Research on high value crop such as oilseeds, vegetables, fruits and livestock is desperately needed. It may be added that livestock production will have a major impact on poverty alleviation because it is more evenly distributed than the crop income. Improvement in water delivery has to be accorded priority.

Efforts made in the past to redistribute the land through land reforms almost failed. Now the land reforms have been officially banished. Negative implications of insecure tenancy arrangement for production can be addressed but political feasibility is not certain, though productivity gains according to some studies are of the order of 18 percent if small farm sharecropper results from a shift to rent fixed tenancy. Efficiency of land markets and security of tenancy can be improved through improvement of land records and facilitation of sale and purchase of land in an overall context of limited arable land.

Rural Non-farm Economy

Precise estimate of the number of rural non-farm enterprise have never been made though a recent World Bank study puts it around 3.8 million. Almost two-fifths of the rural population is engaged as self-employed or wage earner in the non-farm enterprise sector. While most of the self-employed in trade sector, wage employment is found in the construction and transport sectors. Around 30 percent of the average household income in rural areas originates in this sub-sector. Most of these enterprises in rural areas, in nearby small towns, are family based. These enterprises simply are reflective of low productivity and less skilled nature of the business. These so called informal activities to a large extent are recycling wages. According to World Bank study median value added per worker was Rs 18,000 in rural areas and Rs 27,000 small town enterprises. Poor infrastructure and lack of access to credit has been identified as major constraint to growth.

VI. SUMMARY AND CONCLUDING REMARKS

The foregoing review is suggestive of the fact that despite some progress made during the very recent period, poverty levels tended to increase since 1987-88 and nearly 30 percent of the population is below the poverty line. Poverty is mostly confined to rural areas wherein non-farm population emerges to be poorer than the farm population. Within urban areas the major cities are better placed with much less poverty incidence than the other smaller urban cities. In fact the latter are closer to the rural areas in this comparison.

Wages and salaries contribute the major source of income to be followed by the non-farm enterprise income. Crop and livestock occupy the third position though it varies by different zones and by socioeconomic group of the population. Poor tend to rely more on wage income than on other sources. A closer scrutiny of the spread of poverty incidence across various agro-climatic zones is suggestive of the top position being occupied by the least endowed zone of non-irrigated (Barani) Punjab, while the worst conditions emerge for the agriculturally rich zones of Wheat-Cotton producing zones of Southern Punjab and Sindh. These anomalous findings can be explained in terms of other developmental activities for Barani Punjab as well as major urban areas wherein industrial and commercial strides have been made in the past as well as present. Skewed land distribution wherein the majority of income is appropriated by landlords reflects the worst poverty situation in the rich agricultural zones of southern Punjab and Sindh.

Agricultural growth over the years has been responsible for reducing poverty both directly as well as indirectly through development in other branches of the economy. Agriculture sector experienced a respectable growth rate during the green revolution which was mostly input based. During the last decade or so the agriculture sector suffered from year-wise erratic fluctuations due to droughts as well as emergence of the problem of soil fertility generally attributed to inefficiency in the use of water.

There is a need to reiterate that Pakistan is still a natural resource based economy. The agriculture sector is a primary employer and most important contributor to economic surplus and the principal source of its foreign exchange. Millions of families, especially those that are poor and landless, depend on livestock for much of their food and income. Agriculture contributed around 67 percent of Pakistan's foreign exchange earnings—most of which was associated with the sale of cotton textiles though agriculture's share of GDP has declined to 21 percent but it still accounts for 43.4 percent of total employment, while 65.9 percent of the population is dependent on agricultural production.

Although less than 5 percent of Pakistan has forest cover, forests play a number of important roles, regulating the flow of water through the Indus River System (IRS), reducing erosion and the build-up of sediment behind dam. Forest provides a source of wood for construction, cooking and a wide range of other products and creates an important habitat for rare and endangered flora and fauna, providing medicinal plants and important grazing areas for livestock. Rangelands which cover an estimated 37.5 percent of Pakistan's land area will grow increasingly important over time as the country attempts to develop new areas to produce food and create other products for its growing population.

It is imperative to emphasise that serious environmental damages and stresses on natural resource have been experienced. A 1997 World Bank study estimated that

environmental damage annually costs Pakistan the equivalent of US$ 1.8 billion, owing to higher health expenditures, reduced labour productivity, and a wide range of other explicit and implicit costs. Pakistan's natural resource sector is under intense stress. The forest sector is severely damaged, fisheries need major remediation, agricultural land is increasingly becoming water-logged, saline and fragmented while groundwater supplies in places like Balochistan are running out. The glaciers in the northern mountains of Pakistan are beginning to melt due to global warming and agriculture will either greatly diminish or require major adjustments.

Population growth and poor management have reduced per capita water availability from 53,000 cubic meters to 1,200 cubic meters. Logging has contributed to the world's second highest deforestation rate and extensive soil erosion. Each day the Indus River adds an estimated 500 thousand tons of sediment to the Tarbela Dam, which has reduced its lifespan by 22 percent and its water holding capacity by 16 percent. The irrigation system contributes millions of tons of salt to the surrounding farmland. Approximately 6.8 million hectares or around one-thirds of cropped area in Pakistan are impacted by salinity. The irrigation system also has wrecked havoc on the delta region's ecological balance. An examination of the changes in the cropping pattern consistent with water availability appears overdue. Possibilities of substituting drip/sprinkling the currently flood irrigation system has to be assessed. It is in this context the suggestion that user charges may be crop specific to reflect water scarcity merits consideration. There is a desperate need to change the water use practices given the political infeasibility of construction of large dams, albeit with limited life span.

Very little if any has been discussed about the nexus between the natural resource management and poverty reduction except the mapping of poverty with agroclimatic zones. Because of the emphasis upon monitoring the MDGs wherein the focus of researchers as well as data gathering exercise has been on estimating the poverty. Below few suggestions are made to initiate some exercise to unravel this nexus in Pakistan.

(1) It is well-known that poor rely much on natural resources particularly under the community ownership such as forests, sea and river water. The extent to which these are misused and exploited needs to be investigated with particular reference to property rights keeping in view the survival strategy of the poor.
(2) Within agriculture inefficient use of water is noticed with the ensuing salinity/sodicity and worsening soil conditions. It is imperative to examine the extent to which poverty is the cause or effect of these developments.
(3) Differential access to irrigation water is widespread. How much poor are at a disadvantageous position needs to be documented.
(4) Relation between emigration and the return flow of remittances and the land use pattern needs to be reckoned particularly in NWFP and other high emigration areas.

APPENDIX

Appendix Table 1

Comparison of Poverty Estimates, Based on the Official Poverty Line, 1998-99, 2000-01 and 2004-05

Region	1998-99 (1)	2000-01 (2)	2004-05 (3)	Difference (1)-(3) (4)	Difference (2)-(3) (3)
Urban	20.9	22.69	14.94	5.96	7.15
Rural	34.6	39.26	28.13	6.47	11.13
Overall	30.6	34.46	23.94	6.66	10.52

Source: Haque and Arif (2007).

Appendix Table 2

Poverty Estimates in Pakistan, 1998-99, 2001-02 and 2004-05

		1998-99	2001-02	2004-05
Poverty	National	30.0	34.4	29.2
Headcount	Urban	21.0	22.8	19.1
Rate	Rural	33.8	39.1	34.0
	National	6.3	7.0	6.1
Poverty Gap	Urban	4.3	4.6	3.9
	Rural	7.1	8.0	7.2
Squared	Nation	2.0	2.1	2.0
Poverty Gap	Urban	1.3	1.4	1.2
	Rural	2.2	2.4	2.3

Source: World Bank (2007).

Appendix Table 3

Trends in Poverty Incidence

(Percentage of Population Living Below the Poverty Line)

	1987– 88	1996–97	1998–99	2001–02	2004-05
Pakistan	23	28	30	33	30
		(2.4 %)	(3.6 %)	(3.3 %)	(–3.0 %)
Urban	19	25	25	30	28
		(3.5 %)	(0 %)	(6.7 %)	(–2.2 %)
Rural	26	30	32	35	31
		(1.7 %)	(3.3 %)	(3.1 %)	(–3.8 %)

Source: Jamal (2007).

Note: AGR from previous period are given in parenthesis.

Appendix Table 4

Incidence of Poverty by Rural/Urban

	Overall						Rural Areas		
	1998-99	2000-01	2004-05	1998-99	2000-01	2004-05	1998-99	2000-01	2004-05
World Bank (2006d)									
Punjab	29.8	30.7	29.5	23.7	23.0	21.2	32.2	33.8	33.4
Sindh	26.2	37.5	22.4	15.3	20.7	13.8	34.5	48.3	28.9
NWFP	40.8	42.3	39.3	26.1	30.0	26.1	43.3	44.4	41.9
Balochistan	22.1	37.2	32.9	25.2	27.4	21.5	21.6	39.3	35.8
Anwar (2006)									
Punjab	31.6	32.2	29.7	24.2	23.2	20.6	34.6	35.8	33.9
Sindh	26.0	35.3	22.4	15.6	20.1	14.3	34.0	45.0	28.4
NWFP	41.3	41.3	38.9	27.1	29.0	26.5	43.7	43.4	41.4
Balochistan	21.6	35.5	33.1	22.9	26.2	22.4	21.3	37.5	35.9

Appendix Table 5

Poverty Incidence by Province and Region 2004-05 (Poor %)

	Urban Areas			Rural Areas			Overall
	Total	Major Urban Centres	Other	Total	Farm	Non-farm	Total
Pakistan	14.9	9.7	22.1	28.1	23.1	34.2	23.9
Punjab	16.3	11.8	21.0	28.0	19.8	36.6	24.3
Sindh	11.0	6.2	24.6	23.7	24.0	23.2	18.3
NWFP	21.9	20.7	22.5	34.1	32.0	37.0	32.1
Balochistan	18.5	7.4	25.6	28.8	22.3	36.5	26.7

Source: Based on Household Data Tabulation, HIES 2004-05.

Appendix Table 6

Gini Coefficient by Regions and Overall—1992-93 to 2001-02

Year	FBS (2001)	World Bank (2002)	Anwar (2005)
Overall			
1992-93	0.2680	0.276	0.3937
1993-94	0.2709	0.276	0.3864
1998-99	0.3019	0.296	0.4187
2001-02	–	–	0.4129
Rural Areas			
1992-93	0.2389	0.252	0.3668
1993-94	0.2345	0.246	0.3647
1998-99	0.2521	0.251	0.3796
2001-02	–	–	0.3762
Urban Areas			
1992-93	0.3170	0.316	0.3970
1993-94	0.3070	0.302	0.3685
1998-99	0.3596	0.353	0.4510
2001-02	–	–	0.4615

Appendix Table 7

Decomposition of Poverty for Pakistan by Regions between 2001-02 to 2004-05 and 1998-99 to 2001-02

	Growth	Redistribution	Residual	Total Change in Poverty
1998-99 to 2001-02				
Pakistan	5.66	–2.05	–0.22	3.83
Urban	4.58	–1.82	0.99	1.77
Rural	6.12	–2.23	–0.7	4.59
2001-02 to 2004-05				
Pakistan	–12.48	1.42	–0.5	10.56
Urban	–8.06	1.18	0.91	7.79
Rural	–14.29	2.2	–0.93	11.16
1998-99 to 2004-05				
Pakistan	–5.90	–0.18	0.61	6.69
Urban	–4.54	–1.42	0.02	5.98
Rural	–6.47	0.87	0.94	6.54

Source: Anwar (2006).

Appendix Table 8

Poverty Headcount by Agroclimatic Zone 2004-05

(%)

	Urban	Rural	Pakistan
Rice Wheat Punjab	11.00	20.39	16.09
Mixed Punjab	21.25	29.60	26.90
Cotton-Wheat Punjab	20.27	36.54	33.02
Low Intensity Punjab	34.94	29.47	30.34
Barani Punjab	7.66	7.20	7.38
Cotton Wheat Sindh	18.29	24.36	22.51
Rice—Other Sindh	8.43	23.09	15.82
NWFP	21.88	34.13	32.11
Balochistan	18.46	28.76	26.65
Total	14.94	28.13	23.94

Source: Based on Household Level Data Tabulation.

Appendix Table 9

Estimation of Poverty by Farm vs. Non-farm Household by Agro-climatic Zone

	Urban		Rural		Pakistan	
	Farm	Non-farm	Farm	Non-farm	Farm	Non-farm
Rice-Wheat Punjab	4.20	11.33	11.10	28.54	16.09	83.91
Mixed Punjab	8.66	22.32	21.03	37.06	26.90	73.10
Cotton-Wheat Punjab	4.56	22.25	29.17	44.00	33.02	66.98
Low Intensity Punjab	41.51	33.39	21.08	45.11	30.34	69.66
Barani Punjab	–	8.21	2.04	14.55	7.38	92.62
Cotton wheat Sind	27.80	17.47	24.12	24.65	22.51	77.49
Rice- Other Sind	18.45	8.07	23.85	21.83	15.82	84.18
NWFP	15.55	22.64	32.01	36.97	32.11	67.89
Balochistan	25.76	17.75	22.30	36.52	26.65	73.35
Total	14.90	85.10	28.10	78.90	23.94	76.06

Source: Based on Household Level Tabulation of HIES 2004-05.

Appendix Table 10

Sources of Income by Poverty Status 2004-05 (Percentages)

		Wages/ Salaries	Remittance Foreign+ Pak	Crop Income	Livestock Income	Non farm Income	Rental Income	Sale of Property	Other Income	Total Income
Urban	Extremely Poor	55.04	0.19	0.00	1.68	27.44	0.00	0.00	15.65	100.00
	Ultra-poor	39.22	4.64	2.93	0.95	38.87	0.00	0.04	13.36	100.00
	Poor	45.44	3.03	3.08	1.26	33.03	0.36	0.04	13.75	100.00
	Quasi Non-poor	40.17	4.01	2.67	0.89	37.12	0.52	0.05	14.57	100.00
	Non-poor	33.00	6.23	4.00	0.92	33.91	2.10	2.02	17.82	100.00
	Total	37.07	5.08	3.46	0.97	34.77	1.34	1.12	16.19	100.00
Rural	Extremely Poor	26.87	4.40	15.25	11.49	22.00	0.00	0.00	19.99	100.00
	Ultra-poor	33.39	6.14	15.21	6.81	23.18	0.03	0.46	14.79	100.00
	Poor	28.48	7.83	21.01	7.83	20.91	0.09	0.96	12.89	100.00
	Quasi Non-poor	22.37	8.85	26.43	8.55	19.91	0.40	0.80	12.69	100.00
	Non poor	15.30	11.58	32.22	6.97	16.80	0.79	1.58	14.77	100.00
	Total	23.07	9.08	25.58	7.84	19.59	0.38	1.04	13.44	100.00
Pakistan	Extremely Poor	31.14	3.76	12.94	10.00	22.83	0.00	0.00	19.33	100.00
	Ultra-poor	34.95	5.74	11.92	5.24	27.38	0.02	0.35	14.41	100.00
	Poor	32.94	6.57	16.30	6.10	24.10	0.16	0.72	13.11	100.00
	Quasi Non-poor	28.99	7.05	17.59	5.70	26.31	0.44	0.52	13.39	100.00
	Non-poor	26.19	8.29	14.85	3.24	27.33	1.59	1.85	16.65	100.00
	Total	29.13	7.34	16.00	4.86	26.16	0.80	1.07	14.63	100.00

Source: Based on Household Level data tabulation.

Appendix Table 11

Sources of Income by Land Size – 2004-05 (Percentages)

Land Category	Wages/ Salaries	Remittance	Crop Income	Livestock Income	Non-farm Income	Rental Income	Sale of property	Other Income	Total
No land	37.11	7.21	2.96	2.16	33.23	1.01	0.79	15.53	100
1-2.5	28.42	12.26	17.52	6.62	22.13	0.27	0.19	12.59	100
2.5-5	21.71	8.34	28.24	8.23	14.98	0.34	3.87	14.28	100
5-7.5	13.86	8.31	34.97	8.82	18.08	0.10	0.17	15.69	100
7.5-12.5	16.17	9.48	35.84	9.29	15.36	0.24	1.34	12.29	100
12.5-25	17.21	9.25	32.91	9.97	14.16	0.43	2.82	13.26	100
25-hi	10.87	5.59	47.55	10.32	11.46	0.55	0.93	12.72	100
Total	29.13	7.34	16.00	4.86	26.16	0.80	1.07	14.63	100

Source: Based on Household Level HIES 2004-05 Data Tabulation.

Appendix Table 12

Number of Years to Get out of Poverty by Growth and Equity Scenarios

Poverty	Low Growth	Intermediate Growth	High Growth
Equitable Poverty			
Extreme	70	24	15
Moderate	29	10	6
Highly Inequitable Poverty			
Extreme	139	47	29
Moderate	58	20	12
Moderately Inequitable Poverty			
Extreme	93	32	19
Moderate	39	13	8

Source: Weiss and Khan (2006).

Appendix Table 13

Distribution of Zones in Terms of Districts

	Agroclimatic Zones	Districts
1.	Rice/Wheat Punjab	Sialkot
		Gujrat
		Gujranwala
		Sheikhupura
		Lahore
		Kasur
		Narowal
		Mandi Bahauddin
		Hafizabad
2.	Mixed Punjab	Sargodha
		Khushab
		Jhang
		Faisalabad
		Toba Tek Singh
		Okara
3.	Cotton/Wheat Punjab	Sahiwal
		Bahawalnagar
		Bahawalpur
		Rahim Yar Khan
		Multan
		Vehari
		Lodhran
		Khanewal
		Pakpattan
4.	Low Intensity Punjab	D. G. Khan
		Rajanpur
		Muzaffargarh
		Leiah
		Mianwali
		Bhakkar
5.	Barani Punjab	Atttock
		Jhelum
		Rawalpindi
		Islamabad
		Chakwal
6.	Cotton/Wheat Sindh	Sukkur
		Khairpur
		Nawabshah
		Hyderabad
		Tharparker
		Nousheroferoz
		Ghotki
		Umerkot
		Mirpurkhas
		Sanghar
7.	Rice Other Sindh	Jacobbabad
		Larkana
		Dadu
		Thatta
		Badin
		Shikarpur
		Karachi
8.	NWFP	Swat
		Dir
		Chitral
		Buner
		Charsada
		Noshera
		Peshawar
		Kohat
		Karak
		Tank
		Mansehra
		Abbottabad
		Haripur
		Batagram
		Kohistan
		Mardan
		Swabi
		Bannu
		Lakkimarwat
		Shangla
		Malakand Agency
		Hangu
		D.I. Khan
9.	Balochistan	Quetta Division
		Sibi Division
		Kalat Division
		Makran Division
		Zhob Division
		Nasirabad Division (Excluding Nasirabad District)

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