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ADB

Pakistan Resident Mission Working Paper Series

Working Paper No. 2

Agriculture Growth and Rural Poverty

A Review of the Evidence

Sohail J. Malik

Asian Development Bank

Working Paper No. 2

Agricultural Growth and Rural Poverty

A Review of the Evidence

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Foreword

Poverty reduction has always been an important objective of the Asian Development Bank (ADB). In November 1999, ADB approved a Poverty Reduction Strategy articulating the reduction of poverty as the institution's overarching goal. Work on a poverty analysis for Pakistan was initiated in 2000 as part of the process of developing a new Country Strategy and Program. ADB has supported poverty reduction efforts through enhanced levels of assistance and targeted investment projects with the objective of reducing poverty and generating employment; assistance has averaged over \$950 million a year over the last 3 years. In comparison, average annual lending between 1990 and 1998 was just over \$500 million per year. The increased lending specifically focuses on supporting poverty reduction and improvements in systems of governance. Under its Country Strategy and Program for Pakistan for 2002–06, the reduction of poverty is ADB's central objective, and will be made operational by promoting sustainable pro-poor growth, inclusive social development, and good governance.

This report examines the apparent paradox that emerged over the 1990s of relatively good reported agricultural growth accompanied by increasing levels of poverty. Several components of the report were disseminated and discussed during its preparation. The report should be viewed as part of an evolving effort to increase the understanding of poverty in Pakistan. It also points out significant outstanding issues that should be the subject of future work.

Given the importance of the topic, ADB's Pakistan Resident Mission (PRM) feels that it would be useful to circulate the paper among a wider audience. We hope that this publication will not only contribute to the debate on a key issue in Pakistan, but will also prove valuable to our development partners in policymaking and implementation, as well as to a wide range of stakeholders who are interested in poverty reduction issues in general.

Kunio Senga
Director General
South Asia Department
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Preface

In the last 3 years, ADB's assistance to Pakistan has averaged about \$950 million, as compared to a previous average of about \$500 million. The increased level of assistance to Pakistan reflects ADB's strong commitment to poverty reduction and to the Government of Pakistan's reform program. Pakistan has largely achieved macroeconomic stability in the last 2 years, with macroeconomic fundamentals showing the best performance in over a decade. Similarly, growth rates have risen appreciably to an estimated 6.4% in the fiscal year 2004—the highest rate in the last 7 years. Unfortunately, the Pakistan Integrated Household Survey has not been conducted since 2001, and, therefore, it is not possible to determine the extent to which this marked improvement in the macroeconomic picture has translated into improved living conditions for the majority of Pakistan's population—about one-third of Pakistanis were estimated to be living below the poverty line in 2001.

ADB is working with the Government to ensure that the benefits of increased growth and a stronger macroeconomic framework reach the country's poor, resulting in sustained poverty reduction and support for the Government's economic reform program. To this end, ADB supports policy measures geared towards achieving higher growth and poverty reduction in the medium term, and is particularly interested in growth in agriculture, given that it is not only the single biggest sector of the economy, but also employs over half the population. As such, the performance of the agriculture sector has important implications for rural poverty, as well as for gross domestic product (GDP) growth and exports. This paper, the second in PRM's Working Paper Series, examines the relationship between agricultural growth and rural poverty, and reaches some interesting conclusions on the structure of the sector in Pakistan and the consequent implications for poverty.

Dr. Sohail J. Malik, Chairman, Innovative Development Strategies, was commissioned by ADB to prepare this paper. The study was supervised by Dr. Naved Hamid, Senior Economic Advisor, PRM, and benefited from comments from Dr. G. M. Arif, Poverty Consultant, PRM; Dr. Emma Hooper, Poverty and Macroeconomic Specialist, PRM; Safdar Parvez, Program Officer, PRM; and Shanza N. Khan, Poverty Analyst, PRM. The paper was edited and prepared for publication by Maheen Pracha, and the cover designed by Cecilia Caparas at ADB Headquarters in Manila. We hope that this paper will contribute meaningfully to the ongoing debate on poverty dynamics in Pakistan.

M. Ali Shah
Country Director
ADB Pakistan Resident Mission

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Abbreviations

ADB	—	Asian Development Bank
CPI	—	consumer price index
FBS	—	Federal Bureau of Statistics
FY	—	fiscal year
GDP	—	gross domestic product
HIES	—	Household Integrated Economic Survey
IFPRI	—	International Food Policy Research Institute
PRM	—	Pakistan Resident Mission
NWFP	—	North-West Frontier Province
TFP	—	total factor productivity

NOTES

Currency Equivalents (as of 27 January 2005)

Currency Unit	—	Pakistan rupee (PRe/PRs)
PRe/PRs1.00	=	\$0.017
\$1.00	=	PRe/PRs59.55

The fiscal year (FY) of the Government ends on 30 June. FY before a calendar year denotes the year in which the fiscal year ends. For example, FY2002 begins on 1 July 2001 and ends on 30 June 2002. All year figures without the prefix "FY" refer to calendar years, unless otherwise stated.

In this paper, "\$" refers to US dollars.

The analysis in this paper is up to date until December 2003, which is when the study was completed.

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Summary

In Pakistan, achieving high agricultural growth is considered one of the key factors in poverty reduction. The reported growth rate of 4.6% in the agriculture sector in the 1990s was reasonable. However, estimates of poverty based on a headcount measure show an increase in rural poverty during the 1990s. The present study explores the reasons why the benefits of agricultural growth in the 1990s could not be translated into poverty reduction.

A review of the literature shows that, despite high growth rates in the agriculture sector in the 1960s, poverty increased in rural areas because the initial beneficiaries of agricultural subsidies and new technology emerging during this period were generally large farmers. Hence, the increased agricultural growth was not reflected in reduced levels of poverty. The 1970s witnessed a decrease in the incidence of rural poverty, largely due to private investment in agriculture and the heavy emigration of rural-based workers to the Middle East. The resulting increased foreign remittances is cited as one of the major reasons behind the falling poverty trends witnessed during this period. These trends continued through the 1980s largely due to the sustained inflow of remittances and relatively better performance of the agriculture sector.

Several recent studies concur on a trend of increasing rural poverty since the late 1980s. Certain other studies, which found that rural poverty fluctuated during the 1990s, also indicate that by the fiscal year (FY) 2001, the incidence of poverty was considerably higher than in the early 1990s. The consensus is that the percentage of rural persons living below the poverty line has increased over time and especially between FY1997 and FY2001.

This study also examines regional variations in rural poverty. Despite methodological differences, the results of recent studies consistently indicate the lowest levels of poverty for *barani* (rain-fed) Punjab in various years, while high poverty levels have generally been observed in the cotton/wheat zones of Sindh and southern Punjab. Together, these two zones account for over 33% of the poor in Pakistan, but only about 29% of the country's total population (17.5% in cotton/wheat Punjab and 11.2% in cotton/wheat Sindh). Barani Punjab has only a little

Several recent studies concur on a trend of increasing rural poverty since the late 1980s.

The incidence of poverty is low in zones where the percentage of incomes from wages and salaries and transfer incomes is high.

more than half its share of poor as compared to its share of the population. Relatively low poverty levels in the barani areas of northern Punjab are attributed first to certain socio-economic characteristics of barani areas, including the lowest dependency ratio, the highest levels of literacy (particularly female literacy), and the lowest number of unpaid family workers. Second, the rural areas in this region are well integrated with prosperous urban centers that have strong linkages to the services sector. Third, a significant proportion of the region's labor force is employed in both the armed forces and government sector. Finally, due to the high incidence of domestic and overseas migration, remittances contribute a significantly higher proportion to total household income in the barani areas of Punjab.

One of the major contributions of this study is an analysis of income sources: it identifies five major sources in rural Pakistan, including wages/salaries, transfer income, crop income, rental income, and livestock income. Crop income accounts for 67% of the total income in cotton/wheat Sindh and 64% of the total income in cotton/wheat Punjab. These ratios are highest across the two zones, showing that the highest incidence of poverty is in zones that rely most on crop incomes. The incidence of poverty is low in zones where the percentage of incomes from wages and salaries and transfer incomes is high. It appears that poverty is greater in zones where the possibility of diversifying incomes in order to manage risk is limited.

Sources of income vary with poverty status. Crop income is an important source for non-poor households, particularly in irrigated areas of Punjab, while poor households generally rely on wages and salaries. Within the farm sector of the cotton/wheat zone, both non-poor and poor households depend on the cotton crop, although the former diversify crop production by growing sugarcane, particularly in Sindh. The share generated by rice seems to contribute significantly to the income of poor and non-poor households in rice-growing areas of Sindh and Punjab while maize is an important source of income for households located in the North-West Frontier Province (NWFP) and in barani Punjab.

A majority of poor, rural, landless households derive their non-farm income from the construction sector where nearly half the employed persons were found to be under-employed. The services sector, on the other hand, appears to be the most important source of non-farm income for better-off households. Moreover, the wholesale and retail trade, and transport and communications sectors also contribute significantly to the non-farm incomes of non-poor households.

The findings of this study, based on data from the Household Integrated Economic Survey (HIES) for FY2002,¹ show that income from livestock occupies a small proportion of overall household income (less than 2%), and that it increases only marginally across income quintiles. The highest livestock income was reported in the cotton/other zones of Sindh and Balochistan and the lowest in mixed Punjab. These findings, however, are not consistent with the results of earlier studies, which show a much higher contribution of livestock income to total household income. More importantly, the national accounts show that 40% of the value addition to the agriculture sector is from livestock income, and that this contribution is equal to that of crop income. Although it is likely that the HIES does not provide an accurate valuation of livestock produce consumed at home or gifted out, much more in-depth research using all available datasets is needed on this issue.

The study also examines the dynamics of rural poverty, i.e., the movement into and out of poverty. While more rural households have fallen into poverty since the 1990s, many may also have escaped it. The results of the International Food Policy Research Institute (IFPRI) 5-year panel show that, although 21% to 29% of households fall below the poverty line in any given survey year, the probability of entering poverty ranges between 0.15 and 0.24, while that of overcoming poverty varies between 0.43 and 0.51. The sample entry and exit probabilities for the five pairs of sequential years used in the study indicate an increase in the probability of moving into poverty and a decline in that of escaping it over the survey years. Consequent to external shocks or disasters, the probability of remaining poor is much higher amongst poor households than it is for non-poor households. Chronically poor households remain poor for longer periods than those that are transitorily poor.

With respect to the agricultural growth and poverty nexus, this study shows that the estimates of agricultural growth reported by the Pakistan Economic Surveys during the 1990s were highly overstated. The incorrect accounting of livestock, fishing and forestry value-added in some years has contributed to the high reported rate of 4.6% per annum during the 1990s. However, the high growth rates reported for these sectors in this period were not backed by data from the Census of Agriculture or by the disaggregated data in the Pakistan Economic Surveys themselves. After adjusting for these overstated sub-sector growth rates, the growth rate of the agriculture sector over the 1990s declines to only 3.1% per annum. Assuming a population growth rate of 2.5% over this period, this implies a paltry 0.6% per annum per capita growth rate. With such low growth per capita, the increase in rural poverty in the 1990s was inevitable.

Consequent to external shocks or disasters, the probability of remaining poor is much higher amongst poor households than it is for non-poor households.

¹ Government of Pakistan. 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics.

The skewed land distribution is one of the major obstacles hindering the rapid reduction of rural poverty.

A major portion of agricultural growth is dependant on the production of cotton and wheat, Pakistan's two major crops. Cotton production is concentrated in a few districts of the country where land distribution is highly unequal: expanding the production of this crop would theoretically benefit large farmers. Moreover, given the large variability in the production of cotton and wheat, the growth in value-added from these two crops over the 1990s is only 1.3% per annum, implying a negative per capita growth in value-added. For the small farmer in particular, the reliance on cotton with few avenues for diversification means increased poverty. Persistent drought and the lack of irrigation in these regions has also resulted in a substantial decline in cotton production, otherwise the mainstay of many households in this region. The rise in poverty in the 1990s seems to be a result of the increase in the number of poor in the cotton/wheat zones of southern Punjab and Sindh.

Agricultural production in Pakistan is highly erratic: one good year may be preceded or followed by a bad year(s). The available research indicates that, for small farmers, the possibility of overcoming poverty after a bad year declines even if it is followed by a very good year. A considerably higher incidence of transitory poverty indicates the vulnerability of households close to the poverty line. A minor shock may push them into poverty while a little assistance (in terms of employment or income) can help them escape it.

The skewed land distribution is one of the major obstacles hindering the rapid reduction of rural poverty. More than half the total farms are smaller than 5 acres in size. Excessive land fragmentation and the sub-division of landholdings from generation to generation are causing a persistent decline in farm size, and, therefore, in agricultural productivity. Smaller farms tend to be less diversified and so more vulnerable to poverty. In particular, the dependence of small farmers on a highly erratic cotton crop across most of the cotton belt seems to be a major cause of rural poverty. It is necessary to provide small farmers with technology and information to help smooth out the variability in cotton production that they are subject to, and to give them access to technology and markets to enable them to diversify their incomes.

The highly skewed land distribution in rural Pakistan results in sharecropping, which is detrimental to poverty reduction. The incidence of poverty among sharecroppers has been found to be considerably higher than those who cultivate their own land (even small farmers) or cultivate the land of others at a fixed rent. The prevailing tenancy arrangements in different parts of the country lead to the exploitation of sharecroppers. While various tenancy laws exist, there is no proper mechanism to monitor the implementation of these laws.

Finally, mechanization in agriculture has increased considerably, reducing the use of on-farm hired labor. Agricultural workers' real wages show a decline and this, too, has contributed significantly to the rise in poverty.

1 Introduction

In recent years, the relationship between agricultural growth and poverty has been widely debated in Pakistan. This is the outcome of a concern regarding the apparent paradox of relatively good reported agricultural growth accompanied by increasing levels of rural poverty during the 1990s. While the available international literature on the relationship between overall growth and poverty reduction is somewhat ambiguous, the relationship between agricultural growth and poverty reduction is generally assumed as much more clear-cut. In addition to the direct effect of agricultural growth on poverty reduction, there is a much larger indirect effect through the linkages between agriculture and non-farm growth. Non-farm growth is closely linked with agricultural growth since peasant farmers spend a large portion of their incremental income on locally produced non-agricultural goods, thus generating employment and incomes in adjoining areas. The increased demand for non-farm goods leads to a much larger increase in employment, which is the main vehicle for poverty reduction (Mellor 2001).² As such, the increasing rural poverty during the 1990s in the face of the reasonable agricultural growth rates in Pakistan is viewed as surprising.

The increasing rural poverty during the 1990s in the face of the reasonable agricultural growth rates in Pakistan is viewed as surprising.

Agriculture contributes 23% to the total gross domestic product (GDP) of Pakistan, employs 42% of the total employed labor force, and accounts for nearly 9% of the country's export earnings (Government of Pakistan 2004).³ Food products constituted 48% of household

² Mellor, John W. 2001. Employment Multiplier from Agricultural Growth and Poverty Reduction. *Pakistan Development Review* 40 (4). Mellor, in his excellent survey on the subject, has dwelt at length on the relative importance for poverty reduction of 'agricultural growth' vis-à-vis 'growth in general'. While he argues strongly in favor of agriculture-led non-farm growth, he is also careful to assert the relative importance of other factors such as infrastructure and human capital development in order to maximize the gains from such a growth strategy. The important role of these supporting factors is also borne out by his earlier work in the context of agricultural development (see Mellor, John W. 1988. *Lectures on Agricultural Growth and Employment*. Edited by Syed Nawab Haider Naqvi, M. Ghaffar Chaudhry, and Sohail J. Malik. Islamabad: Pakistan Institute of Development Economics).

³ Government of Pakistan. 2004. *Pakistan Economic Survey 2002–03*. Islamabad: Economic Advisor's Wing/Finance Division.

consumption expenditure (39% in urban areas and 54% in rural areas) in the fiscal year (FY) 2002. Agro-based industries accounted for 64% of the total industrial production of Pakistan (Government of Pakistan 2001).⁴ The agriculture sector is, thus, a major determinant of the overall economic growth and well-being in Pakistan.

The reported growth rate of 4.6% in the agriculture sector in the 1990s was reasonable. However, estimates of poverty based on a headcount measure also show a surprising increase in rural poverty during this period. The agricultural growth and rural poverty nexus of the 1990s has not been investigated, although several recent studies have discussed important dimensions of growth and/or poverty. For example, while analyzing total factor productivity trends in Punjab, Ali and Byerlee (2002) observed an increase in average yield as well as cropping intensity over the period 1966–1994.⁵ However, labor use declined during the post-green revolution period as it was displaced by mechanical inputs.⁶ Wide differences were also observed in the growth rates of different production systems with total factor productivity (TFP) growth appearing positive in wheat/cotton and wheat/*mung* (lentil) bean regions, and negative in wheat/rice zones. The decomposition of TFP into different components revealed that all the positive effects of technical innovation and infrastructure improvement were overridden by soil and water degradation. The study also showed the large extent of resource degradation in the province, mostly stemming from the increased use of productivity-enhancing inputs themselves.

It has been emphasized that the skewed land distribution patterns in Pakistan be considered before assuming high agricultural growth as a panacea for rural poverty. Arif and Ahmed (2001), for example, argue that in the presence of political roadblocks to agrarian reforms, the only way to achieve poverty reduction is by providing better employment opportunities in the farm and non-farm sectors as well as a more egalitarian income distribution.⁷ Ali and Tahir (1999), on the contrary, assert that growth is the primary factor responsible for poverty reduction and that a focus on overall growth-oriented policies would automatically

Skewed land distribution patterns in Pakistan need to be considered before assuming high agricultural growth as a panacea for rural poverty.

⁴ Government of Pakistan. 2001. *Census of Manufacturing Industries 1995–96*. Islamabad: Government of Pakistan.

⁵ Ali, Mubarak, and Derek Byerlee. 2002. Productivity Growth and Resource Degradation in Pakistan's Punjab: A Decomposition Analysis. *Economic Development and Cultural Change* 50 (4).

⁶ The availability of subsidized credit also favored the adoption of mechanical technology in the post-green revolution period (Ali and Byerlee 2002).

⁷ Arif, G. M., and Munir Ahmad. 2001. Poverty Across the Agro-Ecological Zones in Rural Pakistan. Paper presented at the National Workshop on Pro-Poor Intervention Strategies in Irrigated Agriculture in Asia: Pakistan, International Water Management Institute, Lahore, 12 March.

alleviate poverty in rural areas.⁸ This singular focus on overall growth is also found in earlier studies. Chaudhry and Chaudhry (1997) highlight the importance of achieving high agricultural growth in order to ensure macroeconomic stability and poverty reduction.⁹ They argue that green revolution technologies did not increase the income disparity between small and large farmers since both showed similar productivity gains. They also point out that there is no issue of unequal access to more capital-intensive inputs, since the development of rental markets for these inputs has facilitated access even for small farmers.

Adverse pricing policies followed by the government had a greater negative impact on small farmers than on large farmers.

Kemal (2001) evaluates the impact of structural adjustment programs on poverty, finding that between FY1988 and FY1998, the tax burden on the poorest increased by 7.4% and that on the richest decreased by 15.9%.¹⁰ Hence, the tax structure actually became regressive rather than progressive. The government also decreased development expenditure during that decade. According to the study, the withdrawal of development subsidies had a serious impact on the agricultural production of small farmers. Although the government increased the prices of agricultural products to compensate farmers, this did not fully offset the negative impact of the input subsidy removal, particularly for small farmers. Kemal's (2001) (footnote 10) findings are in line with the earlier work by Chaudhry and Chaudhry (1997) (footnote 9) that the adverse pricing policies followed by the government had a greater negative impact on small farmers than on large farmers. Except for the 1960s, they argue, agricultural commodities have generally been under-priced. This has led to lower profit margins for farmers and, consequently, declining employment opportunities for agricultural labor.

While Chaudhry and Chaudhry (1997) argue that the impact of price factors overrides that of non-price factors (footnote 9), recent work by Murgai, Ali, and Byerlee (2001)¹¹ tends to stress otherwise. In comparing TFP growth trends in Indian and Pakistani Punjab, they observe higher growth rates for the former. The authors attribute this difference to non-price factors since both regions were following similar price policies. All villages in India were electrified by the mid-1980s, 90%

⁸ Ali, Salman Syed, and Sayyid Tahir. 1999. Dynamics of Growth, Poverty and Inequality in Pakistan. *Pakistan Development Review* 38 (4).

⁹ Chaudhry, M. Ghaffar, and Ghulam Mustafa Chaudhry. 1997. Pakistan's Agricultural Development Since Independence: Inter-Temporal Trends and Explanations. *Pakistan Development Review* 36 (4).

¹⁰ Kemal, A. R. 2001. Structural Adjustment, Macroeconomic Policies and Poverty Trends in Pakistan. Paper presented at the Asia and Pacific Forum on Poverty: Reforming Policies and Institutions for Poverty Reduction, ADB, Manila, 5–9 February.

¹¹ Murgai, Rinku, Mubarak Ali, and Derek Byerlee. 2001. Productivity Growth and Sustainability in Post-Green Revolution Agriculture: The Case of the Indian and Pakistan Punjab. *World Bank Research Observer* 16 (2).

were irrigated, and the density of road network was far greater than that in Pakistan. Moreover, Pakistan lagged far behind India in terms of infrastructure development, education, and research in agriculture. In the case of India, the positive effects of infrastructure development outweighed the negative impact of adverse price policies.

Increased agricultural growth will only decrease poverty if it serves to directly increase the income sources on which the poor are concentrated.

This brief review of recent studies shows that the agricultural growth and rural poverty nexus has not been a key focus of research. The present study is an attempt to fill this gap by exploring the paradox of reasonable agricultural growth and increasing rural poverty in the 1990s. This study shows that the reported high growth rate of 4.6% for agriculture in the 1990s was a statistical artifact. The actual rate during the 1990s was closer to 3%, resulting in a very low 0.6% growth in per capita agriculture income per annum.¹² This, accompanied by land concentration and a decline in the use of casual labor and real rural wages, was responsible for worsening rural poverty over the 1990s. Increased agricultural growth will only decrease poverty if it serves to directly increase the income sources on which the poor are concentrated, or indirectly helps to generate activities that would provide employment and income generation for the poor.

This paper is divided into six sections. Poverty trends, sources of income, and poverty dynamics are discussed in Section 2, followed by an in-depth analysis of agricultural growth in Section 3. Section 4 links rural poverty with land distribution. The decline in the use of casual labor and real wages in rural areas is examined in Section 5. The study's major findings and policy recommendations are presented in Section 6.

¹² A population growth of around 2.5% per annum during the 1990s is assumed here.

2 Rural Poverty: Trends, Sources of Income, and Dynamics

Understanding the complex relationship between rural poverty and agricultural growth in Pakistan requires a comprehensive review of the literature covering the 1990s. This section reviews four important dimensions of rural poverty. The first part examines the available literature on estimated trends in rural poverty; the second looks at regional variations in rural poverty, focusing on agro-climatic zones. Recent studies have highlighted the relatively higher incidence of poverty among non-farm households as compared to farm households across all agro-climatic zones. It seems appropriate, therefore, to examine the sources of income of the poor—this is covered in the third part of the section. Poverty dynamics, i.e., the movement into and out of poverty, are discussed in the fourth part of this section.

Poverty increased in rural areas during the 1960s despite high growth rates in the agriculture sector.

2.1 Trends in Rural Poverty

Various studies have examined prevailing poverty trends in Pakistan since the 1960s.¹³ Although these studies suffer from the weaknesses inherent in comparing poverty over time and place, it is possible to make some general inferences from the results concluded. The consensus emerging from this literature is that poverty increased in rural areas during the 1960s despite high growth rates in the agriculture sector. One argument concerning this unexpected relationship, i.e., high growth rates and a rise in poverty, is that the initial beneficiaries of agricultural

¹³ Some new evidence on poverty is presented in M. H. Malik. 1988. Some New Evidence on the Incidence of Poverty in Pakistan. *Pakistan Development Review* 27 (4); Malik, S. J. 1994. *Poverty in Pakistan, 1984–85, 1987–88 and 1990–91*. Washington, DC: International Food Policy Research Institute; Amjad, R., and A. R. Kemal. 1997. Macroeconomic Policies and Their Impact on Poverty Alleviation in Pakistan. *Pakistan Development Review* 36 (1); Ali and Tahir (1999); Jaffri, Younus. 1999. Assessing Poverty in Pakistan. In *A Profile of Poverty in Pakistan*. Islamabad: Mahbub ul Haq Centre for Human Development; Arif, G. M., Hina Nazli, and Rashida Haq. 2001. Rural Non-Agricultural Employment and Poverty in Pakistan (Part II). *Pakistan Development Review* 39 (4); Anwar, Talat, and Sarfraz K. Qureshi. 2002. Trends in Absolute Poverty in Pakistan: 1990 to 2001. *Pakistan Development Review* 41 (4).

subsidies in the 1960s were generally large farmers. Hence, the increased agricultural growth could not be translated into reduced levels of poverty (footnote 7).

Declining trends in poverty continued in the 1980s, largely due to the inflow of remittances and the relatively better performance of the agriculture sector.

The 1970s were marked by the decreasing incidence of rural poverty. It was during this time that private investment in agriculture reached its peak. There was also very heavy out-migration from the rural areas, resulting in increased foreign remittances, which has been cited as one of the major reasons behind falling poverty trends in the country at the time (Irfan and Amjad 1984).¹⁴ Declining trends in poverty continued in the 1980s, largely due to the inflow of remittances and the relatively better performance of the agriculture sector.

Numerous studies using different methodologies have estimated poverty trends for the 1990s. The results of some of the studies covering more than one survey year are presented in Table 1. Independent studies concur on a continuous trend of increasing rural poverty since the late 1980s (footnotes 8 and 13).

Table 1: Rural Poverty Trends

Year	Malik (1994)	Amjad and Kemal (1997)	Ali and Tahir (1999)	Arif, Nazli, and Haq (2001)	Federal Bureau of Statistics
SY1985	21.1	25.9	25.9	—	—
SY1988	19.6	18.3	20.4	—	—
SY1991	20.6	23.6	24.5	—	—
SY1993	—	23.4	30.5	—	27.0
SY1994	—	—	31.2	29.9	33.0
SY1997	—	—	—	31.6	28.8
SY1999	—	—	—	39.8	34.7
SY2002	—	—	—	—	39.0

SY = survey year.

Note: SY before a calendar year denotes the year in which the survey year ends, e.g., SY2002 ends at some point in 2002.

Sources: Malik, S. J. 1994. *Poverty in Pakistan, 1984–85, 1987–88 and 1990–91*. Washington, DC: International Food Policy Research Institute; Amjad, R., and A. R. Kemal. 1997. *Macroeconomic Policies and Their Impact on Poverty Alleviation in Pakistan*. *Pakistan Development Review* 36 (1); Ali, Salman Syed, and Sayyid Tahir. 1999. *Dynamics of Growth, Poverty and Inequality in Pakistan*. *Pakistan Development Review* 38 (4); Arif, G. M., Hina Nazli, and Rashida Haq. 2001. *Rural Non-Agricultural Employment and Poverty in Pakistan (Part II)*. *Pakistan Development Review* 39 (4); Government of Pakistan. *Household Integrated Economic Survey*. Various issues. Islamabad: Federal Bureau of Statistics.

¹⁴ Irfan, M., and R. Amjad. 1984. *Poverty in Rural Pakistan*. In *Poverty in Rural Asia* edited by Aziz ur R. Khan and Eddy Lee. International Labour Organisation/Asian Employment Programme.

However, the Federal Bureau of Statistics (FBS) finds that rural poverty fluctuated during the 1990s but that by FY2001, the incidence of poverty was considerably higher than in the early 1990s.¹⁵ The consensus is that the percentage of rural persons living below the poverty line has increased over time and especially since the late 1990s.

2.2 Regional Variations in Rural Poverty

Most available analyses of poverty have been conducted at a highly aggregate level. Treating the entire rural area of the country collectively, specifically when an analysis of agricultural performance vis-à-vis other macroeconomic indicators is involved, is intrinsically a myopic approach. Although the majority of such studies have not considered regional variations much beyond rural/urban differences, the few studies that have divided regions on the basis of agro-ecological differences (Appendix 1) have found significant differences in poverty levels.¹⁶ Unfortunately, these studies do not span similar years so that the effect of different methodologies on their estimates is difficult to isolate. However, it is possible to make some general inferences.

Poverty estimates at the level of agro-ecological zones are presented in Table 2. Malik (1992) found the highest incidence of poverty in cotton/wheat Punjab, followed by Balochistan and rice/other Sindh in FY1985 (footnote 16). This order changed, ranking low-intensity Punjab first, followed by cotton/wheat Punjab and rice/other Sindh in FY1988. Arif and Ahmed (2001) found that cotton/wheat Sindh and rice/wheat Punjab were the poorest regions in FY1994 and FY1999 (footnote 7). Using recent data, the present study finds that Sindh and southern Punjab are the poorest regions in Pakistan. During the period FY1994 to FY1999, poverty increased across all regions. Between FY1999 and FY2002, southern and mixed Punjab and the North-West Frontier Province (NWFP) were the most adversely affected by poverty.

Despite methodological differences, the results of the studies presented in Table 2 consistently indicate the lowest levels of poverty in *barani* (rain-fed) Punjab during various years, while high poverty levels are generally observed in Sindh and southern Punjab.

The present study finds that Sindh and southern Punjab are the poorest regions in Pakistan.

¹⁵ Government of Pakistan. *Household Integrated Economic Survey*. Various issues. Islamabad: FBS.

¹⁶ See Malik, S. J. 1992. Rural Poverty in Pakistan: Some Recent Evidence. *Pakistan Development Review* 31 (4); Qureshi, S. K., and G. M. Arif. 1999. Profile of Poverty in Pakistan. Micro Impacts of Macroeconomic and Adjustment Policies Technical Paper Series, No. 5. Pakistan Institute of Development Economics, Islamabad; Arif and Ahmad (2001); World Bank, the. 2002. *Pakistan Poverty Assessment: Poverty in Pakistan—Vulnerabilities, Social Gaps, and Rural Dynamics*. Washington, DC: The World Bank; Asian Development Bank (ADB). 2002. *Poverty in Pakistan: Issues, Causes and Institutional Responses*. Islamabad: ADB.

Table 2: Poverty Headcount and Change in Incidence of Poverty by Agro-Climatic Zone

Agro-Climatic Zone	Poverty Headcount				
	FY1985 (1)	FY1988 (2)	FY1994 (3)	FY1999 (4)	FY2002 (5)
Rice/Wheat Punjab	14.30	8.20	33.10	47.70	38.27
Mixed Punjab	22.70	15.90	21.00	31.40	48.93
Cotton/Wheat Punjab	29.30	21.90	25.40	36.50	55.51
Low-Intensity Punjab	28.00	27.10	24.20	32.60	54.17
Barani Punjab	5.70	3.90	13.80	27.50	26.43
Cotton/Wheat Sindh	20.50	18.90	34.10	39.40	56.81
Rice/Other Sindh	24.30	20.60	26.90	36.80	53.07
North-West Frontier Province	9.10	8.20	28.70	28.20	46.90
Balochistan	28.50	7.90	21.90	54.40	39.06

FY = fiscal year.

Sources: For columns 1 and 2, Malik, S. J. 1992. Rural Poverty in Pakistan: Some Recent Evidence. *Pakistan Development Review* 31 (4); for columns 3 and 4, Arif, G. M., and Munir Ahmad. 2001. Poverty Across the Agro-Ecological Zones in Rural Pakistan. Paper presented at the National Workshop on Pro-Poor Intervention Strategies in Irrigated Agriculture in Asia: Pakistan, International Water Management Institute, Lahore, 12 March; for column 5, author's estimates.

A large proportion of the poor is found across the country's cotton/wheat belt.

As shown in Table 3, the analysis by the FBS, which divides Punjab into three regions (north, central, and south) substantiates these findings, showing the highest levels of poverty in southern Punjab and the lowest in northern Punjab (mainly barani areas) in all the surveys carried out in the 1990s (footnote 15). According to the World Bank (2002), the highest incidence of vulnerability and chronic and transient poverty was also found to occur in the southern irrigated plains of Sindh and Punjab (footnote 16).

Table 3: Poverty Headcount in Rural Punjab by Region

Region	1993	1994	1997	1999	2002
Northern Punjab	10.49	29.27	21.44	29.31	25.90
Central Punjab	27.94	31.60	26.17	34.52	41.30
Southern Punjab	33.24	41.08	32.87	39.74	53.00

FY = fiscal year.

Sources: Government of Pakistan. 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics, for estimates for FY1993, FY1994, FY1997, and FY1999; and author's estimates for FY2002.

Consequently, a large proportion of the poor is found across the country's cotton/wheat belt. The distribution of the poor and the distribution of population based on data from the Household Integrated Economic Survey (HIES) for FY2002 (footnote 1) across agro-climatic zones shows that 20.13% of the poor are located in cotton/wheat Punjab

and another 13.21% in cotton/wheat Sindh (Table 4). Together, these two zones account for over 33% of Pakistan's poor, but only about 29% of the total population (17.47% in cotton/wheat Punjab and 11.20% in cotton/wheat Sindh). A useful index visualizing the location of the poor shows the share of the poor relative to the share of population in each zone. A value of 1 for this index implies that the region in question has a share of the poor equal to its share of the population. A value greater than 1 shows that the zone has a higher share of poor compared to its population, and a share less than 1 shows a smaller share of poor relative to its share of population.

Table 4: Distribution of Poor by Agro-Climatic Zone in FY2002

Agro-Climatic Zone	Poor (%) (1)	Population (%) (2)	Index: Location of Poor (Column 1 ÷ 2)
Rice/Wheat Punjab	12.17	15.32	0.79
Mixed Punjab	13.61	13.40	1.02
Cotton/Wheat Punjab	20.13	17.47	1.15
Low-Intensity Punjab	10.88	9.67	1.12
Barani Punjab	3.09	5.63	0.55
Cotton/Wheat Sindh	13.21	11.20	1.18
Rice/Other Sindh	9.28	8.42	1.10
North-West Frontier Province	13.86	14.24	0.97
Balochistan	3.77	4.65	0.81
Rural Pakistan	100.00	100.00	1.00

FY = fiscal year.

Source: Computed from data in Government of Pakistan. 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics.

This index is calculated in the last column of Table 4, showing that cotton/wheat Sindh has the highest proportion of poor relative to its share of population, followed by cotton/wheat Punjab and low-intensity Punjab. Rice/other Sindh and mixed Punjab indicate a share of 1.10 and 1.02, respectively. Other regions have a smaller share of poor relative to their share of population. Barani Punjab has only a little more than half its share of poor compared to its share of population. Relatively low poverty in the barani areas of northern Punjab is attributed first to the socio-economic characteristics of barani areas, including the lowest dependency ratio, the highest levels of literacy (particularly female literacy) and the lowest number of unpaid family workers. Second, the rural areas in this region are well integrated with prosperous urban centers that have strong linkages to the services sector—only 28% of the employed are involved in agricultural activities. Third, the region's labor force works on a large scale in both the armed forces and the government sector. Due to the high incidence of domestic and overseas migration, remittances contribute a significantly higher proportion to total household income in the barani areas of Punjab.

Relatively low poverty in the barani areas of northern Punjab is attributed first to the socio-economic characteristics of barani areas.

A higher incidence of poverty is reported among non-farm households in all the provinces of Pakistan.

The heterogeneity of rural poverty across these zones and regions indicates the need for further disaggregated analysis to understand the relationship between agricultural growth and rural poverty. Table 5 examines the incidence of poverty across agro-zones by classifying rural households into two important categories: farm and non-farm. Based on HIES data for FY1994 and FY1999 by Qureshi and Arif (1999), a higher incidence of poverty is reported among non-farm households in all the provinces of Pakistan (footnote 16). These estimates classify households by the industrial status of the head of the household, finding a concentration of non-farm poor in Punjab in both years.

Table 5: Farm and Non-Farm Poverty Headcount by Agro-Climatic Zone

Agro-Climatic Zone	FY1994		FY1999		FY2002	
	Farm	Non-Farm	Farm	Non-Farm	Farm	Non-Farm
Rice/Wheat Punjab	21.6	39.9	22.3	33.1	24.9	40.4
Mixed Punjab	16.9	25.8	30.5	34.6	40.9	48.3
Cotton/Wheat Punjab	19.9	31.4	35.2	44.7	42.1	55.6
Low-Intensity Punjab	15.3	28.3	40.2	63.4	48.9	54.6
Barani Punjab	15.7	12.5	3.9	10.1	24.2	25.2
Cotton/Wheat Sindh	33.4	34.2	20.4	32.2	59.3	57.7
Rice/Other Sindh	25.7	27.1	19.5	14.6	60.8	53.0
North-West Frontier Province	23.0	32.3	31.7	31.1	45.7	47.6
Balochistan	33.0	21.1	31.3	26.7	40.4	39.4

FY = fiscal year.

Sources: Arif, G. M., and Munir Ahmad. 2001. Poverty Across the Agro-Ecological Zones in Rural Pakistan. Paper presented at the National Workshop on Pro-Poor Intervention Strategies in Irrigated Agriculture in Asia: Pakistan, International Water Management Institute, Lahore, 12 March; and author's estimates.

However, based on a more detailed classification, Arif, Nazli, and Haq (2000) do not find any significant differences between the levels of poverty for farm and non-farm workers.¹⁷ Arif and Ahmed (2001) (footnote 7) examine the levels of poverty for farm and non-farm households across agro-climatic zones during FY1994 and FY1999, and find a higher incidence of poverty among non-farm households in all zones of Punjab, with the exception of its barani zone in FY1994.¹⁸

The results of the present analysis for FY2002 presented in the last two columns of Table 5 are interesting: poverty among non-farm

¹⁷ See Arif, G. M., Hina Nazli, and Rashida Haq. 2000. Rural Non-Agricultural Employment and Poverty in Pakistan. *Pakistan Development Review* 39 (4). The study distinguishes between farm and non-farm households on the basis of individual occupation rather than the industrial status of the head of the household.

¹⁸ They use the definition provided by Qureshi and Arif (2000) to distinguish between farm and non-farm households.

households remained higher in all zones of Punjab but not in Sindh. One reason for this could be the significantly larger share of tenants in Sindh that drives up poverty estimates for the farm sector. In Sindh, owner farms are generally larger while tenant farms tend to be much smaller than in other provinces. This leads to the question, what are the sources of income for rural households across these agro-climatic zones?

2.3 Sources of Income

In Pakistan, very little analysis is available on the sources of income in rural areas. Previous studies, including Alderman and Garcia (1993),¹⁹ Adams and He (1995),²⁰ Adams (1996),²¹ and the World Bank (2002) (footnote 16), point to the increasing importance of non-farm incomes for rural households. This study defines five major sources of income in rural Pakistan:

- (i) Wages/salaries,
- (ii) Transfer income,
- (iii) Crop income,
- (iv) Rental income,
- (v) Livestock income.

The distribution of income from these sources based on HIES data for FY2002 (footnote 1) is presented in Table 6. This distribution, along with the poverty estimates from the same survey (column 5 of Table 2) reveals that crop income accounts for 67.30% of the total income generated in cotton/wheat Sindh and 64.26% of the total income in cotton/wheat Punjab. These ratios are highest across these two zones, thus showing that the highest incidence of poverty occurs in zones that rely most heavily on crop income.

Three other features of this income distribution by source have significant implications for the poverty question (Tables 2 and 6). These are:

- (i) Crop income in overall rural Pakistan accounted for only about 50% of the total income in FY2002;
- (ii) Wages and salaries, and transfer incomes are also significant income sources;

The highest incidence of poverty occurs in zones that rely most heavily on crop income.

¹⁹ Alderman, H., and M. Garcia. 1993. Poverty, Household Security, and Nutrition in Rural Pakistan. Research Report 96. International Food Policy Research Institute, Washington, DC.

²⁰ Adams Jr., Richard H., and Jane J. He. 1995. Sources of Income Inequality and Poverty in Rural Pakistan. Research Report 102. International Food Policy Research Institute, Washington, DC.

²¹ Adams Jr., Richard H. 1996. Remittances, Income Distribution, and Rural Asset Accumulation. Food Consumption and Nutrition Division (FCND) Discussion Paper No. 17. International Food Policy Research Institute, Washington, DC.

- (iii) The incidence of poverty is low in zones where the percentage of incomes from wages and salaries and transfer incomes is high.

Table 6: Share of Different Income Sources in Total Income by Zone in FY2002

Agro-Climatic Zone	Wages and Salaries	Transfer Income	Crop Income	Rental Income	Livestock Income	Total Income
Rice/Wheat Punjab	37.39	12.85	44.50	3.61	1.65	100.00
Mixed Punjab	37.60	15.12	41.59	2.45	3.24	100.00
Cotton/Wheat Punjab	26.45	5.33	64.26	1.69	2.28	100.00
Low-Intensity Punjab	31.05	8.68	55.37	2.23	2.68	100.00
Barani Punjab	56.94	29.26	13.02	0.05	0.73	100.00
Cotton/Wheat Sindh	29.76	1.22	67.30	0.57	1.15	100.00
Rice/Other Sindh	37.14	1.90	59.59	0.51	0.86	100.00
North-West Frontier Province	41.38	33.84	21.43	1.96	1.40	100.00
Balochistan	54.16	3.69	39.33	0.36	2.46	100.00
Rural Pakistan	35.81	11.14	49.49	1.73	1.84	100.00

FY = fiscal year.

Source: Computed from data in Government of Pakistan. 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics.

Based on the information given in Tables 2 and 6, the Spearman rank correlation coefficient between the headcount of poverty and the percentage share from crop income in FY2002 is + 0.87 and significant at the 1% level. This result confirms the finding that higher levels of poverty are associated with a greater reliance on crop income. Poverty is high in zones where the possibility of diversifying incomes in order to manage risk is limited.

Poverty is high in zones where the possibility of diversifying incomes in order to manage risk is limited.

Another important aspect of the rural distribution of income needs to be highlighted. Crop income accounts for only about 27% of the total income of very small farm households with operated land holdings of up to 1 acre (Table 7).

Table 7: Share of Different Income Sources in Total Income by Size of Operated Land Holding in FY2002

Size of Operated Land Holding (Acres)	Wages and Salaries	Transfer Income	Crop Income	Rental Income	Livestock Income	Total Monthly Income	Households (%)
None	76.25	20.11	1.43	0.74	1.47	100.00	56.61
Up to 1	45.46	24.07	26.73	1.00	2.73	100.00	5.12
Up to 5	23.44	10.31	61.16	2.53	2.56	100.00	18.01
Up to 12.5	9.40	4.33	82.44	1.64	2.20	100.00	13.95
More than 12.5	4.54	2.06	89.10	2.95	1.35	100.00	6.31
All households	35.81	11.14	49.49	1.73	1.84	100.00	100.00

FY = fiscal year.

Source: Computed from data in Government of Pakistan. 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics.

In fact, these households should be classified as non-farm households. Following this classification, non-farm households account for over 60% of total rural households (56.61% with no land and 5.12% with less than 1 acre). Poverty alleviation strategies aimed at providing gainful sources of alternative employment to this 60% of rural households should receive much greater focus than they presently do.

Sources of income differ not only across agro-climatic zones, but also across poverty status in each zone (Table 8). Crop income is an important source for non-poor households while poor households generally rely on wages and salaries.

Crop income is an important source for non-poor households while poor households generally rely on wages and salaries.

Table 8: Sources of Income by Agro-Climatic Zone and Poverty Status

Agro-Climatic Zone	Poverty Status	Wages and Salaries	Transfer Income	Crop Income	Rental Income	Livestock Income	Total Income
Rice/Wheat Punjab	Poor	63.28	9.04	24.83	1.52	1.32	100.00
	Non-poor	29.62	13.99	50.40	4.24	1.75	100.00
	Total	37.39	12.85	44.50	3.61	1.65	100.00
Mixed Punjab	Poor	48.48	12.28	33.60	1.31	4.33	100.00
	Non-poor	31.44	16.73	46.12	3.09	2.63	100.00
	Total	37.60	15.12	41.59	2.45	3.24	100.00
Cotton/Wheat Punjab	Poor	39.36	4.40	53.39	0.65	2.20	100.00
	Non-poor	18.04	5.93	71.34	2.37	2.32	100.00
	Total	26.45	5.33	64.26	1.69	2.28	100.00
Low-Intensity Punjab	Poor	36.11	7.84	51.93	1.11	3.01	100.00
	Non-poor	26.01	9.51	58.79	3.35	2.35	100.00
	Total	31.05	8.68	55.37	2.23	2.68	100.00
Barani Punjab	Poor	64.85	19.24	14.94	0.00	0.97	100.00
	Non-poor	54.79	31.98	12.50	0.07	0.66	100.00
	Total	56.94	29.26	13.02	0.05	0.73	100.00
Cotton/Wheat Sindh	Poor	30.13	0.87	67.65	0.05	1.30	100.00
	Non-poor	29.37	1.58	66.93	1.13	0.98	100.00
	Total	29.76	1.22	67.30	0.57	1.15	100.00
Rice/Other Sindh	Poor	34.02	1.16	64.21	0.18	0.43	100.00
	Non-poor	39.85	2.55	55.57	0.79	1.23	100.00
	Total	37.14	1.90	59.59	0.51	0.86	100.00
North-West Frontier Province	Poor	44.92	28.87	23.38	1.27	1.56	100.00
	Non-poor	39.05	37.10	20.15	2.42	1.29	100.00
	Total	41.38	33.84	21.43	1.96	1.40	100.00
Balochistan	Poor	56.24	1.49	40.60	0.00	1.67	100.00
	Non-poor	53.05	4.87	38.65	0.56	2.88	100.00
	Total	54.16	3.69	39.33	0.36	2.46	100.00
Rural Pakistan	Poor	41.66	7.96	47.78	0.69	1.90	100.00
	Non-poor	32.08	13.16	50.58	2.38	1.80	100.00
	Total	35.81	11.14	49.49	1.73	1.84	100.00

Source: Computed from data in Government of Pakistan. 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics.

Over 45% of total crop income is generated in the cotton/wheat zones of Punjab and Sindh, 26% of which goes to non-poor households (Appendix 1). In barani Punjab and NWFP, transfer income is a more important source of income, followed by wages and salaries. Most non-poor households depend on transfer income in these zones. It is, therefore, important to examine the sources of farm and non-farm income in more detail to see how they vary in importance across regions for both poor and non-poor households.

2.3.1 Farm Income

Due to the highly skewed distribution of land in rural Pakistan, farm income was found to be an inequality-increasing source of income during the early 1990s. A high correlation was found to exist between farm income and land ownership, and an uneven distribution in favor of the rich, as substantiated in Alderman and Garcia (1993) (footnote 19), and Adams and He (1995) (footnote 20). Wheat and rice appeared the most important crops for poor households; while rich households depended on sugarcane and other crops.²² Recent household survey data indicate large variations in average crop income across poverty status (Table 9). Better-off households in rural areas derive a larger share of their income from crop production (Appendix 1). Due to the unequal distribution of land, an increase in crop income serves to exacerbate inequality. There is also a greater level of income diversity among households belonging to upper income quintiles since they have the resources to invest in business and/or human capital. Within crop income, the poor rely mainly on food crops such as wheat, while the rich diversify crop production by growing more cash crops such as sugarcane and cotton.

Within crop income, the poor rely mainly on food crops such as wheat.

2.3.2 Livestock Income

Livestock plays an important role in the process of income generation. Adams and He (1995) classify it as an inequality-reducing source of income (footnote 20). A majority of poor households, especially those who are landless or small landowners, depend on livestock for income. Nazli (2003) found that 47% of rural households depend on either farm cultivation or livestock for their livelihood while 13% of households depend solely on livestock; the incidence of poverty is found to be highest among the latter.²³ According to Adams and He (1995), local cows and female buffalo are the main sources of livestock income for both the poorest as well as richest households (footnote 20). The poor, however, derive 60% of their livestock income from local cows whereas the rich depend more on female buffalo.

²² These included cotton, groundnut, rapeseed, mustard, and others.

²³ Nazli, Hina. 2003. Rural Labor Markets in Pakistan: Institutions and Constraints. Background paper prepared for Pakistan Rural Factor Market Study. The World Bank, Washington, DC.

Table 9: Sources of Farm Income by Poverty Status and Agro-Climatic Zone in FY2002

Agro-Climatic Zone	Wheat	Cotton	Sugarcane	Rice	Maize	Pulses	Fruits	Vegetables	Other Crops	Total Crop Income
Poor Households										
Rice/Wheat Punjab	37.98	0.71	8.09	24.41	0.04	0.00	6.39	0.78	21.60	100.00
Mixed Punjab	42.52	3.48	16.73	11.00	0.78	0.95	0.76	1.06	22.71	100.00
Cotton/Wheat Punjab	32.11	46.21	3.49	2.41	0.13	0.35	1.06	1.28	12.96	100.00
Low-Intensity Punjab	38.57	35.92	3.27	0.70	0.33	3.20	0.11	3.12	14.78	100.00
Barani Punjab	44.23	0.00	0.00	2.02	13.66	3.33	0.00	0.45	36.32	100.00
Cotton/Wheat Sindh	26.61	53.55	11.25	1.88	0.02	0.00	1.34	0.17	5.19	100.00
Rice/Other Sindh	29.15	4.75	9.56	46.15	0.36	0.97	0.86	0.26	7.94	100.00
North-West Frontier Province	22.86	0.17	7.13	2.94	20.94	1.25	4.23	10.89	29.58	100.00
Balochistan	41.72	3.96	2.18	22.21	3.12	0.01	13.95	3.98	8.87	100.00
Rural Pakistan	31.73	30.65	8.05	11.53	1.60	0.76	1.91	1.59	12.18	100.00
Non-Poor Households										
Rice/Wheat Punjab	40.22	0.35	3.65	33.47	0.27	0.31	0.26	2.74	18.75	100.00
Mixed Punjab	31.65	2.49	16.37	6.91	2.41	1.60	16.96	2.36	19.24	100.00
Cotton/Wheat Punjab	31.01	44.16	3.87	1.73	0.25	0.42	3.26	2.98	12.31	100.00
Low-Intensity Punjab	40.62	28.63	6.80	0.87	0.26	3.40	1.31	1.22	16.88	100.00
Barani Punjab	42.48	0.00	0.00	1.16	18.91	7.15	0.02	7.63	22.65	100.00
Cotton/Wheat Sindh	23.69	44.07	21.37	1.40	0.00	0.00	1.74	1.67	6.06	100.00
Rice/Other Sindh	19.25	2.59	20.50	28.29	0.58	0.02	19.57	2.36	6.84	100.00
North-West Frontier Province	23.47	0.09	7.61	2.04	20.71	1.22	5.63	9.21	30.02	100.00
Balochistan	46.79	4.41	1.01	8.99	1.24	0.24	26.02	3.86	7.43	100.00
Rural Pakistan	31.81	21.52	9.87	11.41	1.67	0.78	6.21	2.82	13.91	100.00
All Households										
Rice/Wheat Punjab	39.91	0.40	4.25	32.23	0.24	0.27	1.09	2.47	19.13	100.00
Mixed Punjab	34.84	2.78	16.47	8.11	1.93	1.41	12.21	1.98	20.26	100.00
Cotton/Wheat Punjab	31.38	44.85	3.74	1.96	0.21	0.40	2.53	2.41	12.52	100.00
Low-Intensity Punjab	39.65	32.06	5.14	0.79	0.29	3.31	0.74	2.12	15.89	100.00
Barani Punjab	42.97	0.00	0.00	1.40	17.43	6.07	0.01	5.60	26.52	100.00
Cotton/Wheat Sindh	25.24	49.10	16.00	1.66	0.01	0.00	1.52	0.87	5.60	100.00
Rice/Other Sindh	24.30	3.69	14.92	37.40	0.47	0.51	10.03	1.29	7.40	100.00
North-West Frontier Province	23.20	0.12	7.39	2.44	20.81	1.23	5.01	9.96	29.83	100.00
Balochistan	44.85	4.24	1.46	14.06	1.96	0.16	21.39	3.90	7.98	100.00
Rural Pakistan	31.78	25.03	9.17	11.46	1.65	0.77	4.55	2.35	13.24	100.00

Source: Computed from data in Government of Pakistan, 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics.

This study finds the ownership of female buffalo and local cows to be an inequality-reducing source of income while the ownership of male buffalo and bullocks is inequality-increasing. Data from the HIES for FY2002, however, indicate that income from livestock forms a small proportion of overall household income (less than 2%) and that it increases only marginally across income quintiles (footnote 1). Based on this dataset, the highest livestock income is reported in the cotton/other zone of Sindh and in Balochistan, and the lowest in mixed Punjab.

Much more in-depth research is needed on the low contribution of livestock to overall household income, as computed from the HIES datasets, keeping in view that 40% of the value addition to the agriculture sector is from livestock, and that this contribution is equal to that of the crop sector. It is likely that the HIES does not provide an accurate valuation of livestock produce consumed at home or gifted out.

2.3.3 Non-Farm Income

Given the lack of employment opportunities in the farm sector, the focus of rural households has shifted towards the non-farm sector. Adams and He (1995), for example, observe that the non-farm sector was the most important source of income in rural areas, and indicate that self-employment, unskilled labor, and government employment are three major sources of non-farm income (footnote 20). The World Bank (2002) also observes a high dependency on non-farm sources of income in rural Pakistan: about 44% of rural households were found to depend on non-farm sources of income in 2001, of which 40% belonged to the lowest income group and 45% to the highest income group (footnote 16).

Non-farm income forms a considerable share of total income (73%) for landless households. This share was found to be higher for households belonging to the highest income groups. Wage income appears the largest source of non-farm income. Arif, Nazli, and Haq (2000) find that wages, salaries and self-employment income are the major sources of non-farm income (footnote 17). In their sample, these categories apply to more than 94% of all non-farm workers. They find a significant difference in the nature of activities between self-employed and wage employees. For the self-employed, wholesale and retail trade appear the most important economic activities, whereas wage employees are concentrated in the construction sector.

Self-employment, unskilled labor, and government employment are three major sources of non-farm income.

Table 10: Sources of Non-Farm Income by Poverty Status and Agro-Climatic Zone in FY2002

Agro-Climatic Zone	Manufacturing/ Mining	Construction	Wholesale/ Retail Trade	Hotel/ Restaurant Operation	Transport/ Communication	Services	Total Non-Farm Income
Poor Households							
Rice/Wheat Punjab	24.32	18.92	15.79	1.71	7.04	13.76	100.00
Mixed Punjab	21.87	17.28	16.49	1.49	8.77	17.13	100.00
Cotton/Wheat Punjab	8.35	19.83	16.01	1.73	9.20	19.71	100.00
Low-Intensity Punjab	10.29	17.73	11.45	1.32	11.07	27.41	100.00
Barani Punjab	12.38	36.00	11.04	0.00	5.74	32.95	100.00
Cotton/Wheat Sindh	7.78	12.92	7.28	1.13	6.67	19.80	100.00
Rice/Other Sindh	10.51	19.28	9.66	1.70	8.36	22.84	100.00
North-West Frontier Province	7.45	22.86	14.53	0.41	15.74	26.61	100.00
Balochistan	1.02	25.59	5.74	2.05	14.76	33.16	100.00
Rural Pakistan	12.21	19.43	12.71	1.36	9.55	21.71	100.00
Non-Poor Households							
Rice/Wheat Punjab	27.08	6.71	21.33	2.39	8.91	22.86	100.00
Mixed Punjab	16.74	9.64	20.74	2.47	10.59	28.98	100.00
Cotton/Wheat Punjab	10.49	9.12	18.69	1.15	8.19	29.80	100.00
Low-Intensity Punjab	9.60	8.11	13.46	0.90	6.69	45.22	100.00
Barani Punjab	4.98	14.67	15.91	0.34	12.29	46.70	100.00
Cotton/Wheat Sindh	10.45	8.87	11.03	1.47	7.91	33.63	100.00
Rice/Other Sindh	10.21	6.87	17.19	3.09	5.21	27.50	100.00
North-West Frontier Province	4.36	8.45	17.38	1.43	13.81	43.18	100.00
Balochistan	2.23	14.94	11.07	5.02	17.76	36.59	100.00
Rural Pakistan	12.15	9.35	16.99	2.05	10.14	33.52	100.00
All Households							
Rice/Wheat Punjab	26.00	11.48	19.17	2.13	8.18	19.31	100.00
Mixed Punjab	19.14	13.20	18.76	2.02	9.74	23.45	100.00
Cotton/Wheat Punjab	9.24	15.41	17.12	1.49	8.78	23.87	100.00
Low-Intensity Punjab	10.00	13.69	12.29	1.14	9.23	34.89	100.00
Barani Punjab	6.78	19.86	14.72	0.26	10.69	43.35	100.00
Cotton/Wheat Sindh	9.05	10.98	9.08	1.29	7.27	26.42	100.00
Rice/Other Sindh	10.34	12.15	13.99	2.49	6.55	25.52	100.00
North-West Frontier Province	5.69	14.65	16.15	0.99	14.64	36.05	100.00
Balochistan	1.80	18.80	9.14	3.94	16.67	35.35	100.00
Rural Pakistan	12.18	13.91	15.05	1.74	9.87	28.17	100.00

FY = fiscal year.

Note: The total of each row does not add up to 100 since some columns have been suppressed to highlight the important sources of non-farm income.

Source: Computed from data in Government of Pakistan. 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics.

The foregoing analysis indicates a higher incidence of vulnerability among households who depend solely on agriculture.

An analysis of the HIES dataset for FY2002 indicates that a majority of poor households derive their non-farm income from the construction sector (Table 10). According to the Labour Force Survey for FY2000, this sector is characterized by the highest incidence of under-employment: nearly half the employed persons in this sector were found to be under-employed.²⁴ This sector absorbs unskilled and/or low-skilled labor. The services sector, on the other hand, appears to be the most important source of non-farm income for better-off households. For example, households belonging to the highest income group derive 50% of their non-farm income from the services sector. In addition, wholesale and retail trade, and transport and communication also contribute significantly to the non-farm income of non-poor households.

The foregoing analysis indicates a higher incidence of vulnerability among households who depend solely on agriculture. Rural areas that are well connected with urban centers seem to be more prosperous. The lack of employment opportunities in rural areas results in either labor reallocation or migration. In both cases, human capital plays a positive and significant role. The poorest of the poor possess neither the human capital nor the resources to migrate—this vulnerable group needs special attention.

Income from the non-farm sector derives from diverse activities. The poor tend to be found in low-productivity activities that demand low levels of skill and little education, whereas within wage work, the poor are generally involved in unskilled labor in the construction sector. The poor tend to be concentrated in regions that involve minimum investment since they lack the resources to invest in high-productivity self-employment or wage work. Better-off households in the non-farm sector invest in high-productivity self-employment activities that demand high physical capital, or engage in wage work that offers high returns but requires high levels of human capital.

2.4 Rural Poverty Dynamics

Poor rural households do not necessarily remain poor forever. While more rural households have fallen into poverty since the 1990s than at any other time, some may indeed have escaped it. These movements into and out of poverty have rarely been examined in Pakistan because data that might provide information on such poverty dynamics are scarce. However, the International Food Policy Research Institute's (IFPRI) survey of 728 households conducted between 1986 and 1991 contains

²⁴ Government of Pakistan. 2001. *Labour Force Survey*. Islamabad: FBS.

useful information on poverty dynamics.²⁵ Analyzing this panel data, Baulch and McCulloch (1998) constructed a poverty transition matrix for poor and non-poor households for each sequential pair of years between the first and last years of the panel.²⁶ A high level of mobility was observed throughout the period. For example, the results of the 5-year panel show that, although 21% to 29% of households fall below the poverty line in any given survey year, the probability of entering into poverty ranges between 0.15 and 0.24, while the probability of overcoming poverty varies between 0.43 and 0.51 (Table 11). The sample entry and exit probabilities for the five pairs of sequential years indicate an increase in the probability of moving into poverty and a decline in the probability of escaping it. This is also reflected in the rising trend in poverty headcount.

The results of the 5-year panel show that, although 21% to 29% of households fall below the poverty line in any given survey year, the probability of entering into poverty ranges between 0.15 and 0.24.

Table 11: Sample Entry and Exit Probabilities for Poverty

Year	Probability of Entering Poverty	Probability of Escaping Poverty	Headcount (%)	Households Moving In or Out of Poverty (%)
FY1987 to FY1988	0.15	0.51	21.40	22.00
FY1988 to FY1989	0.17	0.43	25.20	22.20
FY1989 to FY1990	0.20	0.51	27.10	27.60
FY1990 to FY1991	0.20	0.46	29.30	27.00
FY1987 to FY1991	0.24	0.49	29.30	29.00

FY = fiscal year.

Source: Baulch, Bob, and Neil McCulloch. 1998. Being Poor and Becoming Poor: Poverty Status and Poverty Transitions in Rural Pakistan. Institute of Development Studies (IDS) Working Paper No. 79. IDS, Sussex. Available <http://www.ids.ac.uk/ids/pvty/pvprp.html>.

²⁵ This survey was conducted in the rural areas of four districts chosen from each province of Pakistan, during a period of 14 visits to the same 728 households across 6 years between 1986 and 1991. In this survey, one of the poorest districts in each province was selected based on a ranking of districts according to levels of development. The four districts thus selected were Attock in Punjab, Badin in Sindh, Dir in the NWFP, and Kalat in Balochistan. In addition to these districts, Faisalabad (one of the more prosperous districts in Punjab) was chosen as a control unit. Two markets (*mandis*) within each district were chosen at random as primary sampling units, and 52 villages were selected on the basis of their distance from the main markets serving these districts. Households were randomly selected from a complete list of households in each village. Data were collected from the selected households on a wide range of topics: income, expenditure, food consumption, nutrition and health status, education, employment, land ownership and rural credit. For details, see Alderman and Garcia (1993), and Adams and He (1995).

²⁶ Baulch, Bob, and Neil McCulloch. 1998. Being Poor and Becoming Poor: Poverty Status and Poverty Transitions in Rural Pakistan. Institute of Development Studies (IDS) Working Paper No. 79. IDS, Sussex. Available <http://www.ids.ac.uk/ids/pvty/pvprp.html>

In order to distinguish the chronically poor from the transient poor in rural Pakistan, McCulloch and Baulch (1999) conducted another study using the same IFPRI panel data, and found that 58% of the sampled households experienced poverty at least once during the 5 years of the panel survey.²⁷ Of these, 73% were transitorily poor and 26% were chronically poor (Table 12). Chronically poor households remained poor for longer periods compared to transitorily poor households.

Table 12: Number of Periods: Poor by Poverty Status

No. of Periods	Chronically Poor	Transitorily Poor	Total
1	1	164	165
2	7	92	99
3	33	37	70
4	44	2	46
5	20	0	20
Total	105	295	400

Source: McCulloch, Neil, and Bob Baulch. 1999. Distinguishing the Chronically from the Transitorily Poor: Evidence from Pakistan. Institute of Development Studies (IDS) Working Paper No. 97. IDS, Sussex. Available <http://www.ids.ac.uk/ids/pvty/pvprp.html>.

McCulloch and Baulch (2000), in a third study, decomposed estimates of the poverty headcount, poverty gap, and square of the poverty gap into transitory and chronic components.²⁸ Their results indicated that 61% of poverty is caused by the chronic component, while 62% of the poverty gap and 82% of the square of the poverty gap can be attributed to the transitory component. This indicates that both the depth and severity of poverty is higher among transitorily poor households and that poverty in the panel is predominantly explained by fluctuations in income rather than by levels of average income.

The McCulloch and Baulch (2000) study also simulates the impact of policy intervention on the severity of chronic and transitory poverty (footnote 28). The study examines the impact of two types of policies: those designed to 'smooth' incomes, and those designed to 'increase growth in income'. The authors find that an increase in income leads to a greater reduction in chronic poverty, but that its effect on transitory poverty is almost negligible. The smoothing of income, on the other hand, reduces overall poverty through a reduction in transitory poverty, but does not significantly reduce chronic poverty. These results indicate that transitory poverty can be reduced if policy interventions aim at leveling

Both the depth and severity of poverty is higher among transitorily poor households.

²⁷ McCulloch, Neil, and Bob Baulch. 1999. Distinguishing the Chronically from the Transitorily Poor: Evidence from Pakistan. IDS Working Paper No. 97. IDS, Sussex. Available <http://www.ids.ac.uk/ids/pvty/pvprp.html>

²⁸ McCulloch, Neil, and Bob Baulch. 2000. Simulating the Impact of Policy Upon Chronic and Transitory Poverty in Rural Pakistan. *Journal of Development Studies* 36(6).

out income fluctuations. The results also show that a reduction in chronic poverty is possible through large and sustained growth in household incomes.

Using the IFPRI dataset but applying a different methodology, Villanger's (2003)²⁹ findings substantiate the results of the McCulloch and Baulch (2000) study (footnote 28). Examining the impact of natural disasters on the income mobility of rural households in Pakistan, Villanger finds that consequent to a shock/disaster, the probability of remaining poor is much higher among poor households than it is for rich households.

Consequent to a shock/disaster, the probability of remaining poor is much higher among poor households than it is for rich households.

Research conducted by Kurosaki (2002) based on a panel dataset of 299 sample households surveyed in 1996 and 1999 in three villages in the Peshawar district of NWFP, also found a higher incidence of transitory poverty.³⁰ Contrary to other studies, Kurosaki (2003) observes a partial transformation of income variability into consumption variability due to the ex-post risk coping mechanism.³¹ Households that are excluded from such coping mechanisms are found to be more vulnerable, exhibiting a higher risk of a substantial fall in consumption, a loss of land assets, and a drastic cut in children's school enrollment.

Based on more recent data from rural Pakistan, the World Bank (2002) indicates that nearly 57% of households are prone to poverty as they are clustered around the poverty line (these households lie between 0.75 to 1.25 times the poverty line) (footnote 16). Of those prone to falling into poverty, 69% were found to be vulnerable.³² On the other hand, only 2% of households with mean expenditure levels greater than 1.25 times the poverty line could be classified as vulnerable, although some did

²⁹ Villanger, Espen. 2003. *The Effects of Disasters on Income Mobility in Rural Pakistan: Bootstrap Inference and Measurement Error Simulations*. Bergen: Norwegian School of Economics. Villanger uses a simple bootstrap method to facilitate statistical inference based on mobility matrices, and constructs confidence intervals for the probability estimates.

³⁰ Kurosaki, Takashi. 2002. *Consumption Vulnerability and Dynamic Poverty in the North-West Frontier Province, Pakistan*. Available www.ier.hit-u.ac.jp/~kurosaki. In this study, the choice of villages was based on different levels of economic development. The first selection criterion was agricultural technology: one of the three sample villages was rain-fed, another semi-irrigated, and the other fully irrigated. The second criterion was location, i.e., villages should be located along the rural-urban continuum. Real per capita consumption expenditure was used as a welfare indicator.

³¹ ———. 2003. *Measurement of Chronic and Transient Poverty: Theory and Application to Pakistan*. Discussion Paper Series A, No. 436. Institute of Economic Research at Hitotsubashi University, Tokyo.

³² Households with mean expenditure levels below 0.75% of the poverty line were classified as vulnerable although they exhibited a substantially smaller variance in estimated expenditure.

experience transient poverty. These results indicate that vulnerability to poverty in rural Pakistan is due to low mean expenditure levels as well as variations in expenditure due to shocks.

3 Agricultural Growth and Rural Poverty

The main objective of this paper is to explore the unexpected relationship between the reported reasonable agricultural growth and rise in poverty witnessed during the 1990s. High agricultural growth is considered a key factor in ensuring macroeconomic stability and poverty reduction; a focus on overall growth-oriented policies can help alleviate rural poverty. Understanding the effect of agricultural growth on poverty requires an in-depth analysis of trends in agricultural growth. This section first deconstructs the growth of agriculture, establishes the reasons why the high reported agricultural growth in the 1990s was a statistical artifact, and then discusses fluctuations in agricultural growth. As mentioned earlier, poverty levels tend to be higher across the country's cotton/wheat belt. This is illustrated in the cotton/wheat Punjab zone in terms of its crop production.

3.1 Decomposing the Agricultural Growth of the 1990s

Overall agricultural growth is a composite of the growth of different sub-sectors, e.g., crop and livestock; each of these sub-sectors has a different impact on income distribution, and, accordingly, on poverty (footnotes 20 and 21). Any conclusive statement regarding the growth and poverty nexus, therefore, needs to be made in the light of a disaggregated analysis.

According to official statistics, the agriculture sector grew at an overall rate of 4.6% per annum during the 1990s. However, after FY1997, the combined scarcity of water and persistent drought affected agricultural growth badly, causing economic growth to slow down during the last 2 years of the decade. The crop sub-sector, in particular, declined during these years, with a substantial fall in the value-added of major crops. However, the livestock and fisheries sub-sectors grew remarkably during this period (Table 13). Wheat, rice, cotton, and sugarcane account for 90% of the total major crop production (Appendix 1) while the share of major crops in total agricultural value-added is 41% (Table 13). This indicates that these four crops contribute nearly 37% to the total agricultural value-added.

High agricultural growth is considered a key factor in ensuring macroeconomic stability and poverty reduction.

Table 13: Composition of Agriculture Sector, GDP Growth, and Agricultural Value-Added

Year	GDP Growth Rate (%)	Share of Agriculture in GDP (%)	Share of Agricultural Value-Added (%)				
			Major Crops	Minor Crops	Livestock	Fishing	Forestry
FY1992	7.57	26.25	50.40	16.18	28.81	3.71	0.91
FY1993	2.10	24.35	44.91	17.75	32.25	4.13	0.95
FY1994	4.37	24.55	43.21	19.00	32.48	4.35	0.95
FY1995	5.06	24.91	44.07	19.06	32.16	3.79	0.91
FY1996	6.60	26.10	41.80	17.90	36.40	3.29	0.61
FY1997	1.70	25.70	39.94	18.04	37.89	3.45	0.67
FY1998	3.49	25.95	41.37	18.67	35.97	3.49	0.50
FY1999	4.18	25.40	40.57	19.08	36.41	3.45	0.49
FY2000	3.91	25.93	44.14	16.35	34.97	3.57	0.97
FY2001	2.20	24.64	40.72	16.79	37.86	3.53	1.10
FY2002	3.40	23.90	40.00	16.49	39.31	3.11	1.08
FY2003	5.10	23.60	40.64	15.90	38.85	3.48	1.13
Growth Rate for Period							
FY1970 to FY1975	4.58	1.39	0.79	3.88	1.98	(12.91)	7.19
FY1975 to FY1980	5.25	3.52	3.43	3.98	3.09	11.19	17.77
FY1980 to FY1985	6.46	2.50	1.37	2.40	4.65	7.07	(4.24)
FY1985 to FY1990	5.40	4.45	3.23	5.55	5.91	4.38	7.12
FY1990 to FY1995	4.56	3.44	1.19	5.70	5.62	4.12	(3.58)
FY1995 to FY2000	3.67	4.03	3.77	2.59	7.08	3.73	2.61
FY2000 to FY2002	2.98	(0.65)	(10.27)	1.10	8.44	0.15	11.02

FY = fiscal year, GDP = gross domestic product.

Sources: Computed from data in Government of Pakistan. *Pakistan Economic Survey*. Various issues. Islamabad: Economic Advisor's Wing/Finance Division.

The share of wheat, rice, and sugarcane in the total major crop value-added has increased over time, although that of cotton has declined, and yields show a fluctuating pattern during the 1990s—the cotton yield fluctuated between 0.77 to 0.49 tons per hectare in this period (Appendix 1).³³ These fluctuations are reflected in the performance of the crop sub-sector and have a significant effect on the performance of the overall agriculture sector and, therefore, on GDP. For example, a fall in agricultural output in FY1993 and FY1997 coincided with a slowing down of overall economic growth as reported in the Pakistan Economic Surveys for those years.³⁴

³³ Pickney, Thomas C. 1989. *The Demand for Public Storage of Wheat in Pakistan*. Research Report 77. IFPRI, Washington, DC. According to the agro-climatic classification given in this study, the cotton zone consists of 19 districts: 9 in Punjab and 10 in Sindh. The ranking given in Social Policy Development Center. 2001. *Annual Review*. Karachi: Social Policy Development Center, places most of these districts at lower levels not only within the province but also at a national level.

³⁴ Government of Pakistan. *Pakistan Economic Survey*. Various issues. Islamabad: Economic Advisor's Wing/Finance Division.

Livestock is another important sub-sector of agriculture. According to the Pakistan Economic Survey, nearly 40% of Pakistan's rural population is engaged in livestock activities (footnote 34). This sub-sector contributes 39% to the agricultural value-added, which is nearly as much as the crop sector and about 9% of the GDP. Yet data from the HIES (footnote 1) show that income from livestock accounts for only 1.84% of rural income (Tables 6 and 7). This anomaly needs to be explored further.

Livestock production includes milk, beef, mutton, poultry meat, wool, hair, bones, fat, blood, eggs, hides, and skins. A considerable increase in the population of livestock and production of livestock products has been noted (footnote 34). As pointed out earlier, the majority of the non-poor depends on crops while the poor, the majority of whom are landless or small farmers, depend on livestock. The proportion of households that depend on both crops and livestock is substantially higher for the non-poor.³⁵ It is, therefore, important to analyze the disaggregated growth rate of agriculture and its components to determine its relationship with rural poverty.

An analysis of disaggregated agricultural growth shows that the high reported growth rate of agriculture in the 1990s was a statistical artifact.

3.2 High Reported Agricultural Growth in the 1990s: A Statistical Artifact

An analysis of disaggregated agricultural growth shows that the high reported growth rate of agriculture in the 1990s was a statistical artifact. The following factors contributed to the high estimates of agricultural growth during the 1990s.

3.2.1 Over-Reported Growth in Livestock Value-Added in FY1996

The agriculture sector grew at its highest rate (11.7%) in FY1996, mainly due to the high growth of livestock value-added that year. The livestock census conducted in FY1996 was responsible for documenting this large reported growth, and revealed a much higher value-added than had previously been documented.³⁶ This additional value-added was recorded as a large one-time increase in the survey year and shows up as

³⁵ Government of Pakistan. 2001. *Household Integrated Economic Survey 1999–2000*. Islamabad: FBS. See also Nazli (2003).

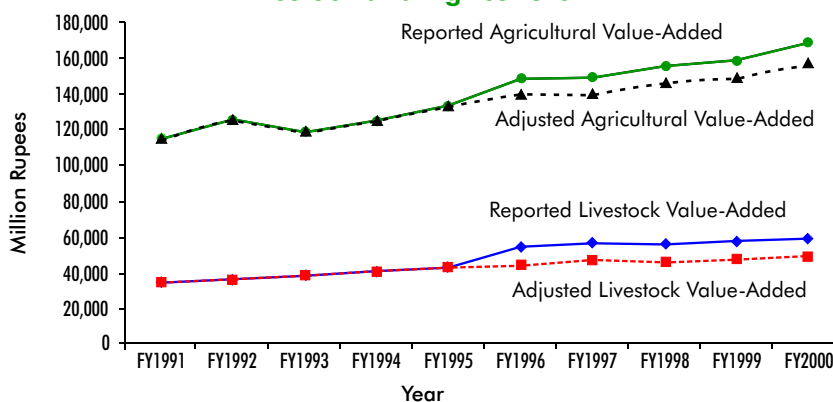
³⁶ Government of Pakistan. 1996. *Census of Livestock*. Islamabad: Agriculture Census Organization/Statistics Division.

The previously unreported livestock value-added should have resulted in a backward adjustment in the under-reported numbers for value-added over several years.

the reported growth rate of livestock value-added of 26%.³⁷ This high growth rate is one of the reasons for the 11.7% growth in the agriculture sector as a whole, in FY1996.

In fact, the previously unreported livestock value-added should have resulted in a backward adjustment in the under-reported numbers for value-added over several years, rather than in a one-time increase in livestock value-added to the extent of 26% over the previous year. Making this adjustment reduces the overall agricultural growth rate from 12.0% to 4.7%,³⁸ while the overall growth rate of the agriculture sector during the 1990s declines to 3.2% from 4.5% simply by adjusting for the one outlying value of livestock value-added in FY1996 (Figures 1 and 2).

Figure 1: Reported and Adjusted Value-Added of Livestock and Agriculture



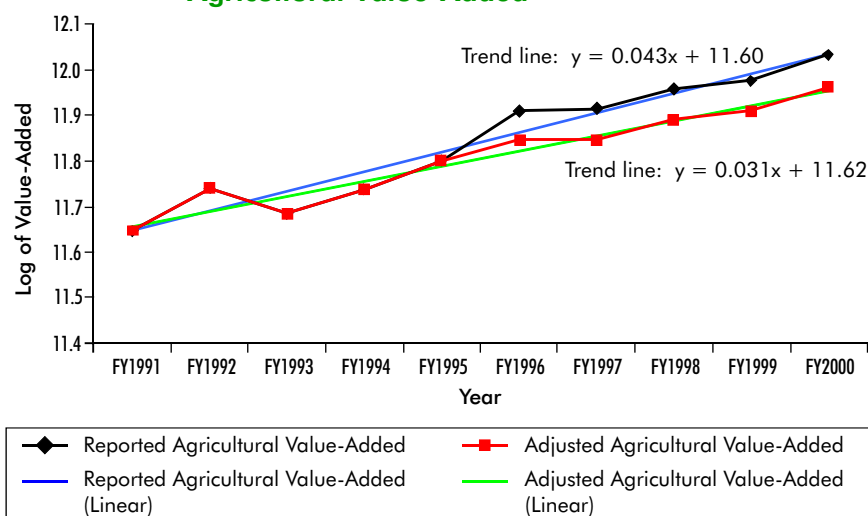
Note: 'Reported' indicates values given in the Pakistan Economic Survey 2002–03.

Sources: Government of Pakistan. 2003. *Pakistan Economic Survey 2002–03*. Islamabad: Economic Advisor's Wing/Finance Division; and author's calculations.

³⁷ The livestock census actually shows a decline in livestock population from 116 million in the previous year to 110 million in that year. Only after including poultry does the livestock population show an increase of 5% between FY1995 and FY1996. It can be noted that the production of most livestock products documented in the Pakistan Economic Surveys also shows a decline. In particular, there was a fall in the production of skins and eggs in this year, and the increase in value-added comes from the considerable reported increase in the production of milk and poultry meat. For example, the production of milk alone reportedly increased by 21% between FY1995 and FY1996 (Pakistan Economic Survey 2002–03, p. 31, Tables 2.14 and 2.15 in the statistical appendix). It is not biologically possible for milk production to go up by that large a percentage without any significant increase in the number of milch animals.

³⁸ Simply spreading this growth out over 10 years to the previous livestock census in FY1986 would assume that the census in FY1985 had no under-coverage. However, the possibility that the large additional unreported livestock value-added detected in FY1996 was a carryover from the period prior to FY1986 is equally likely. Hence, for the purpose of this adjustment, we have opted to assume that the growth rate for the decade minus the FY1996 outlier is the true rate and have applied it to all years including FY1996.

Figure 2: Trend in Growth Rates of Reported and Adjusted Agricultural Value-Added



Sources: Government of Pakistan. 2003. *Pakistan Economic Survey 2002–03*. Islamabad: Economic Advisor's Wing/Finance Division; and author's calculations.

3.2.2 High Growth Rate of Fisheries and Forestry in FY2000

In addition to the high growth rate of the major crops sector, the national accounts for FY2000 also indicate high growth rates for the fishery and forestry sub-sectors. The value-added of fisheries as reported in the national accounts grew by 9.5%. However, fish production for that year declined by 6%.³⁹ This occurred mainly because of the decline in marine fish production in Sindh that was reported in the Agricultural Statistics (Footnote 39) and substantiated by popular record. Despite this decline, the national accounts data indicate high growth in this sub-sector (Table 1.3 in the statistical appendix of the Pakistan Economic Survey 2002–03; footnote 3).

The share of the forestry sub-sector declined from 1.26% in FY1991 to 0.46% in FY1999, and then more than doubled to 0.97% the following year (FY2000). The growth rate of this sub-sector between FY1999 and FY2000 is reported as 113% in the Pakistan Economic Survey (footnote 34). The forestry sub-sector produces major products such as timber and firewood, and minor forest products such as, resin, mazri, and ephedra.⁴⁰ The detailed data in the Pakistan Economic Survey show a decline in the value of major forest products by 22% and a decline in the quantity of

The national accounts for FY2000 also indicate high growth rates for the fishery and forestry sub-sectors.

³⁹ Government of Pakistan. 2003. *Agricultural Statistics of Pakistan 2001–02*. Islamabad: Ministry of Food, Agriculture and Livestock, Economic Wing.

⁴⁰ According to the national accounts of Pakistan for FY2002, "As no significant inputs are revealed in this sector, the estimates of output are assumed to be of gross value-added". Government of Pakistan. 2003. *National Accounts of Pakistan 2001–02*. Islamabad: FBS/Statistics Division.

Growth in agricultural production in Pakistan was not sustained over several years during the 1990s.

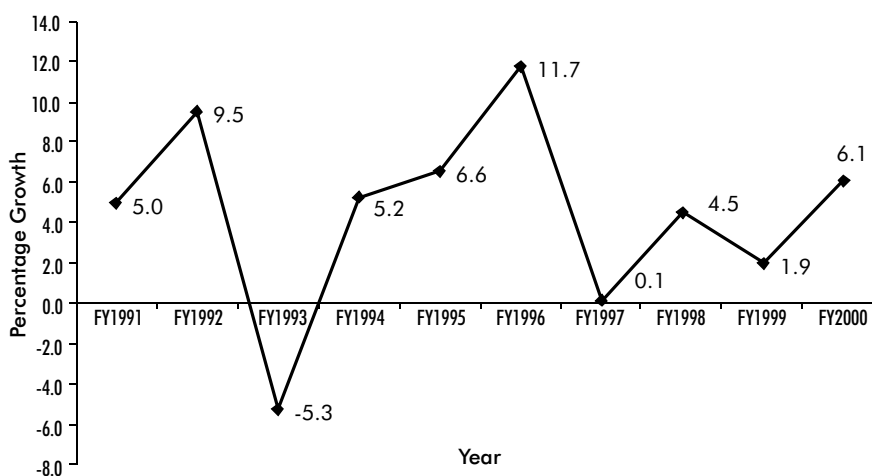
minor forest products by 28% in FY2000 (footnote 34). Yet the national accounts indicate a growth rate of 113% for the forestry sub-sector in that year. This seems highly unlikely given that no significant changes occurred that might have altered the continuing (declining) trend in forest products. Adjusting the growth rates of these two sub-sectors to reflect their trend values causes the overall growth rate of the agriculture sector to decline from 6.1% to 5.1% in FY2000.

The agricultural growth reported in the Pakistan Economic Surveys for the 1990s is, therefore, overstated; and the rate of growth, a statistical artifact based on the incorrect accounting of the value-added of livestock in FY1996, and that of forestry and fisheries in FY2000. The growth of the agriculture sector during the 1990s, after the adjustments described above, is only 3.1% per annum and not 4.3% (Figures 1 and 2). Assuming a population growth of around 2.5% per annum during the 1990s, this translates into a very low agricultural growth rate of 0.6% per capita per annum.

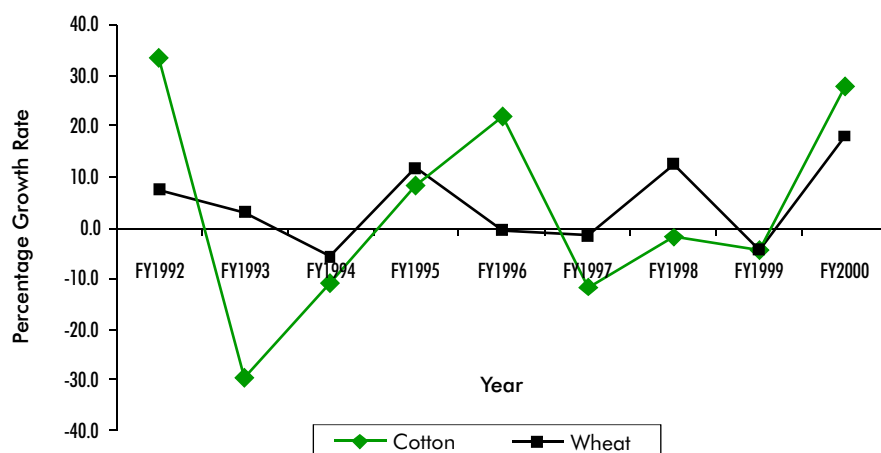
3.3 Great Variability in Agricultural Growth

It can be noted that growth in agricultural production in Pakistan was not sustained over several years during the 1990s (Figure 3). This variation is best illustrated by looking at trends in the production of two major crops. One or two good years for cotton production are generally followed or preceded by bad year(s). Similar trends have been noticed in wheat production (Figure 4). Households are pushed into transitory poverty due to poor agricultural production — one good year followed or preceded by more than one bad year means that they cannot effectively move out of poverty.

Figure 3: Percentage Agricultural Growth



Source: Government of Pakistan. 2003. *Pakistan Economic Survey 2002–03*. Islamabad: Economic Advisor's Wing/Finance Division.

Figure 4: Annual Growth Rates of Cotton and Wheat

Source: Government of Pakistan. 2003. *Pakistan Economic Survey 2002–03*. Islamabad: Economic Advisor's Wing/Finance Division.

Moreover, inadequate employment opportunities and the inability to diversify agricultural production translate into continued and increased poverty. The variability in production is much larger for cotton than for wheat, and stems largely from the variability in yields (Table 14). The area under both crops tends to be much more stable. The coefficient of variation for yield is much higher than that for area in the case of both crops, and the variability in yield for cotton is significantly higher than that for wheat.

Inadequate employment opportunities and the inability to diversify agricultural production translate into continued and increased poverty.

Table 14: Coefficient of Variation for Area, Production, and Yield of Cotton and Wheat

Item	Area		Production		Yield/Hectare	
	Cotton	Wheat	Cotton	Wheat	Cotton	Wheat
Coefficient of Variation	0.05	0.02	0.15	0.11	0.14	0.09

Source: Government of Pakistan. 2003. *Agricultural Statistics of Pakistan 2001–02*. Islamabad: Ministry of Food, Agriculture and Livestock, Economic Wing.

“Cotton and wheat are the most important crops for all households irrespective of farm size. In bad years, non-poor small farmers have a higher probability to fall into poverty. For the small farmers who are already below the poverty line, the probability of come out of poverty, even in the following good year, reduces [sic].”⁴¹

⁴¹ Villanger (2003) points out that not only do poor households tend to remain poor in the year during which they experience a shock, but as a result of such shocks, their chances of moving out of poverty in subsequent years is also reduced. This study finds that for the households that are subject to a shock in a normal year, there is a 40% increase in the probability of their remaining poor. This implies that households are more prone to remaining poor in subsequent years when they are hit by income shocks.

3.4 High Poverty in Cotton/Wheat Punjab: An Illustration

The analysis presented in Section 2 revealed that the highest incidence of rural poverty is in the cotton/wheat zones of rural Pakistan where the population relies most heavily on crop incomes. As reported earlier, crop income accounts for 67.30% of total income in cotton/wheat Sindh and 64.26% of total income in cotton/wheat Punjab. These two agro-climatic zones account for 33% of the poor (20.13% in cotton/wheat Punjab and 13.21% in cotton/wheat Sindh), and about 29% of the population (17.47% in cotton/wheat Punjab and 11.20% in cotton/wheat Sindh). It is important to analyze the nature of agricultural growth in these regions to understand the reasons for this high rural poverty. To this end, a detailed analysis of the cotton/wheat zone in Punjab is presented below.

3.4.1 Dependence on Cotton and Wheat

During the years that agriculture grew significantly in the 1990s (9.5% in FY1992, 6.6% in FY1995, and 6.1% in FY2000), the growth of cotton and wheat was an important factor.⁴² This is due to the large share of both crops in the value-added of major crops. For example, the collective share of cotton and wheat in major crops in these 3 years was 65.98%, 59.16%, and 60.31%, respectively (Table 15). In good years, the growth in production of these two crops determines the overall growth of the sub-sector's major crops and, hence, the growth of the overall agriculture sector and vice versa. In FY1992, cotton production grew by 33% and wheat by 8%; in FY1995, these growth rates were 8% and 12%, respectively (Figure 4). In FY1996, the production of major crops grew by 6%, to which cotton alone contributed 32%. The high growth of cotton (28%) and wheat (18%) in FY2000 is reflected in the high growth of the major crops' sector (15%), and thus in high agricultural growth (5.5%).⁴³

An examination of the growth rates reported in Table 15 reveals that the growth of cotton value-added was, in fact, negative over the 1990s, while that of cotton and wheat combined was only 1.33% per annum. This low rate is due to the large variation in the growth rate.⁴⁴

During the years that agriculture grew significantly in the 1990s, the growth of cotton and wheat was an important factor.

⁴² These two crops contribute on average more than 60% to the value-added of total major crops and nearly 30% to the total agricultural value-added. Therefore, high growth in the major crops sector, when it occurs, is driven largely by high growth in cotton and wheat production. Conversely, poor growth in the production of these two crops pulls down the overall growth rate for the sector.

⁴³ This is after adjusting the growth of the fisheries and forestry sub-sectors. Before this adjustment, the agricultural growth rate was 6.1%.

⁴⁴ This variability is examined in more detail later in this section.

Table 15: Percentage Share of Major Crops and Agricultural Value-Added and Annual Growth Rates of Cotton and Wheat

Year	Share of Major Crops (Value-Added)			Share of Agricultural (Value-Added)			Annual Growth Rate (Value-Added)		
	Wheat	Cotton	Combined Share	Wheat	Cotton	Combined Share	Wheat	Cotton	Combined Share
FY1991	29.18	33.32	62.50	13.95	15.92	29.87	2.57	24.12	8.12
FY1992	27.05	38.93	65.98	13.63	19.62	33.25	7.05	21.91	16.84
FY1993	31.79	31.37	63.16	14.28	14.09	28.37	(0.81)	(31.99)	(19.20)
FY1994	30.03	27.53	57.56	12.98	11.90	24.87	(4.36)	(11.15)	(7.73)
FY1995	31.36	27.80	59.16	13.82	12.25	26.07	13.51	9.76	11.71
FY1996	28.74	31.57	60.31	12.01	13.20	25.21	(2.90)	20.32	8.02
FY1997	29.41	29.11	58.52	11.75	11.63	23.37	(2.10)	(11.78)	(7.17)
FY1998	30.63	26.42	57.05	12.67	10.93	23.60	12.76	(1.74)	5.55
FY1999	29.26	25.21	54.47	11.87	10.23	22.10	(4.49)	(4.60)	(4.54)
FY2000	32.13	28.89	61.02	14.18	12.75	26.93	26.74	32.27	29.30
Overall							3.33	(0.51)	1.33

FY = fiscal year.

Note: The overall growth rates in the last row have been estimated from trend regressions.

Source: Government of Pakistan. 2003. *Pakistan Economic Survey 2002–03*. Islamabad: Economic Advisor's Wing/Finance Division.

Most of Pakistan's cotton-producing districts are located in southern Punjab, which is the country's poorest region. Cotton and wheat are the most commonly grown crops here.⁴⁵ A district-wise analysis shows that in Lodhran, Bahawalpur, and Rahimyar Khan, 87%, 82%, and 82% of the total cropped area, respectively, is under cotton and wheat. In cotton/wheat Punjab, Rahimyar Khan, Muzaffargarh, and Bahawalpur rank highest in cotton production, while Muzaffargarh, Rahimyar Khan, and Bahawalnagar rank highest in wheat production (Table 16).

3.4.2 Inadequate Crop Diversification and Employment

According to the ranking of the Social Policy Development Center (2001), most of the cotton growing districts in Punjab are classified as highly deprived overall and have low employment rankings (footnote 33). Except for Bahawalnagar, the other three districts (Rahimyar Khan, Muzaffargarh, and Bahawalpur) fall into the category of 'high deprivation' with national rankings of 63, 72, and 64, respectively.

⁴⁵ Cotton is a *kharif* crop and wheat is a *rabi* crop. Nearly 69% of Pakistan's cotton area is in cotton/wheat Punjab and 22% in cotton/wheat Sindh. Similarly, 31% of Pakistan's total wheat area is in cotton/wheat Punjab and 10% in cotton/wheat Sindh.

Table 16: Distribution of Cropped Areas in Cotton/Wheat Punjab and Sindh by Important Kharif and Rabi Crops

Region	Percentage of Cropped Area Under									
	Total Kharif Crops	Rice	Cotton	Sugarcane	Kharif Fodder	Vegetables	Total Rabi Crops	Wheat	Oilseed	Rabi Fodder
Pakistan	100	100	100	100	100	100	100	100	100	100
Punjab	66.12	59.03	76.78	58.77	81.37	33.06	69.79	68.86	69.79	85.30
Cotton/Wheat Punjab	30.72	8.44	68.98	13.60	23.36	14.27	28.97	31.23	33.98	32.22
Cholistan	0.31	0.00	0.81	0.01	0.39	0.06	0.33	0.30	3.80	0.26
Multan	2.08	0.45	5.23	0.23	1.44	1.04	2.28	2.52	0.00	2.78
Sahiwal	1.77	0.70	2.69	1.38	2.86	0.89	1.61	1.56	0.80	3.21
Vehari	2.94	0.63	7.01	1.31	2.48	1.47	2.47	2.73	3.70	3.29
Khanewal	2.72	0.68	6.23	0.60	2.93	1.36	2.31	2.47	1.16	3.86
Bahawalnagar	3.52	2.64	5.90	2.74	3.79	1.76	3.11	3.28	7.78	4.49
Bahawalpur	2.97	0.21	7.86	0.99	2.06	2.97	2.51	2.81	6.27	2.79
Rahimyar Khan	3.84	0.55	10.03	2.13	2.07	0.86	3.21	3.80	1.60	2.85
Lodhran	1.96	0.07	5.58	0.22	1.06	0.47	1.62	1.86	3.24	1.44
Layyah	1.88	0.03	2.18	1.67	2.74	1.88	2.88	2.07	1.44	2.24
Dera Ghazi Khan	1.76	1.07	3.62	0.20	0.95	0.39	1.72	2.09	1.72	0.76
Muzaffargarh	3.54	1.27	7.89	1.97	0.27	0.80	3.38	3.87	1.69	3.38
Rajapur	1.42	0.15	3.95	0.16	0.33	0.32	1.56	1.87	0.78	0.86
Sindh	21.89	34.40	23.30	26.76	8.42	21.89	14.87	14.27	29.74	13.22
Cotton/Wheat Sindh	11.59	3.94	22.30	14.66	7.14	15.19	9.27	9.29	17.64	9.22

Note: *Kharif* refers to the summer crop, and *rabi* to the winter crop.

Source: Government of Pakistan. 2003. *Census of Agriculture 2000*. Islamabad: Economic Affairs and Statistics Division/Agriculture Census Organization.

Sugarcane, rice, and fodder are the other important crops grown in the *kharif* (summer crop) season, and oilseed and fodder in the *rabi* (winter crop) season. Data from the Agricultural Census for 2000 indicate that, as farm size increases, people tend to grow sugarcane in Muzaffargarh, and rice and sugarcane in Bahawalpur, Rahimyar Khan, and Bahawalnagar.⁴⁶ However, in Rahimyar Khan, the extent of crop diversification is less than that in Bahawalnagar, indicating that, in case of crop failure, households in these districts (especially those with small farms) are more vulnerable. These households have neither enough resources for crop diversification nor access to opportunities for off-farm employment (footnote 33). Hence, there are few alternative opportunities for supplementing their income.

⁴⁶ Government of Pakistan. 2003. *Census of Agriculture 2000*. Islamabad: Economic Affairs and Statistics Division/Agriculture Census Organization.

4 Land Distribution, Tenancy Arrangements, and Rural Poverty

The skewed distribution of land could be one of the major obstacles hindering the rapid reduction of rural poverty. Data from the Agricultural Census Organization confirm the skewed distribution of operated land in Pakistan. In 2000, more than half the country's total farms were reported to be smaller than 5 acres in size; these farms occupy 16% of the total farm area. In contrast, only 5% of farms were 25 acres or more in size, and the total area under them, 38% in 2000 (Table 17). The number of small farms (under 5 acres) has increased from 19% in 1960 to 58% in 2000. The area under these farms has also increased considerably—from 3% in 1960 to 16% in 2000. The number of farms in all other farm categories has declined since 1960, except for medium sized farms (5 to 12.5 acres).

Data from the Agricultural Census Organization confirm the skewed distribution of operated land in Pakistan.

In 1990, 69% of farms in Pakistan were owner-operated, 12% were operated by owners-cum-tenants, and 19% by tenants. In 2000, the proportion of owner-operated farms increased to 78% whereas the proportion of farms operated by owners-cum-tenants (8%) and tenants (14%) declined (Table 18). It is interesting to note that most owner-operated farms are smaller than 5 acres (79% in 1990 and 83% in 2000). A large proportion of farms operated by owners-cum tenants fall in the category of 25–50 acres (24% in 1990 and 18% in 2000). Tenant-operated farms were generally less than 12.5 acres in size.

Table 17: Farm Classification by Size

Size of Farm (Acres)	Number of Farms (%)					Farms Area (%)				
	1960	1972	1980	1990	2000	1960	1972	1980	1990	2000
< 5	19.0	28.2	34.1	47.5	57.6	3.0	5.2	7.1	11.3	15.5
5 to < 12.5	44.3	39.9	39.4	33.4	28.1	23.6	25.2	27.3	27.5	27.9
12.5 to < 25	23.8	21.1	17.3	12.2	8.8	27.0	26.6	24.7	21.5	19.1
25 to < 50	9.0	7.7	6.5	4.7	3.9	19.0	18.8	17.8	15.8	16.3
50 to < 150	3.3	2.7	2.4	1.8	1.2	16.0	15.1	14.7	13.9	9.6
> 150	0.5	0.4	0.3	0.3	0.2	11.5	9.1	8.5	10.1	11.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Government of Pakistan. *Census of Agriculture*. Various issues. Islamabad: Economic Affairs and Statistics Division/Agriculture Census Organization.

Table 18: Percentage Distribution of Farms by Size and Type of Tenure

Size of Farm (Acres)	Owner		Owner-cum-Tenant		Tenant	
	1990	2000	1990	2000	1990	2000
Pakistan						
All Farms	68.8	77.6	12.4	8.4	18.8	14.0
< 5	78.8	83.0	5.8	4.1	17.0	12.9
5 to < 12.5	59.0	70.1	15.8	12.4	25.2	17.5
12.5 to < 25	58.7	67.6	22.3	18.6	18.9	13.8
25 to < 50	62.9	73.2	23.8	17.9	13.3	8.9
50 and >	72.7	78.7	20.5	15.4	6.8	5.9
Punjab						
All Farms	69.5	78.6	15.7	11.0	14.9	10.4
< 5	81.8	86.3	6.8	5.1	11.4	8.6
5 to < 12.5	61.0	71.4	20.4	15.6	18.6	13.0
12.5 to < 25	54.6	62.7	27.2	23.9	18.3	13.4
25 to < 50	56.8	63.8	29.2	25.4	14.0	10.7
50 and >	66.4	67.9	26.4	23.1	7.1	9.0
Sindh						
All Farms	50.6	65.8	7.6	4.0	41.8	30.2
< 5	55.2	61.9	2.9	1.6	42.0	36.5
5 to < 12.5	40.5	61.8	8.5	5.5	51.0	32.7
12.5 to < 25	62.2	79.1	13.2	8.2	24.6	12.7
25 to < 50	75.2	89.8	13.7	6.0	11.1	4.4
50 and >	77.2	90.8	15.9	6.0	6.9	3.2
North-West Frontier Province						
All Farms	78.1	82.9	8.4	6.2	13.5	10.9
< 5	80.8	85.7	5.6	3.7	13.6	10.7
5 to < 12.5	72.8	72.9	12.4	13.6	14.8	13.5
12.5 to < 25	70.2	70.2	18.8	20.8	11.0	9.0
25 to < 50	67.4	74.6	23.6	19.4	9.1	6.0
50 and >	73.6	74.1	21.9	24.2	4.6	1.7
Balochistan						
All Farms	80.7	81.8	4.9	2.6	14.3	15.6
< 5	93.8	85.8	0.8	0.4	5.3	13.7
5 to < 12.5	79.0	79.9	3.5	2.4	17.5	17.8
12.5 to < 25	71.7	75.4	6.7	3.7	21.6	21.0
25 to < 50	75.0	85.1	9.4	4.8	15.6	10.2
50 and >	83.4	88.4	9.6	7.0	7.0	4.6

Sources: Government of Pakistan. *Census of Agriculture*. Issues for 1990 and 2000. Islamabad: Economic Affairs and Statistics Division/Agriculture Census Organization.

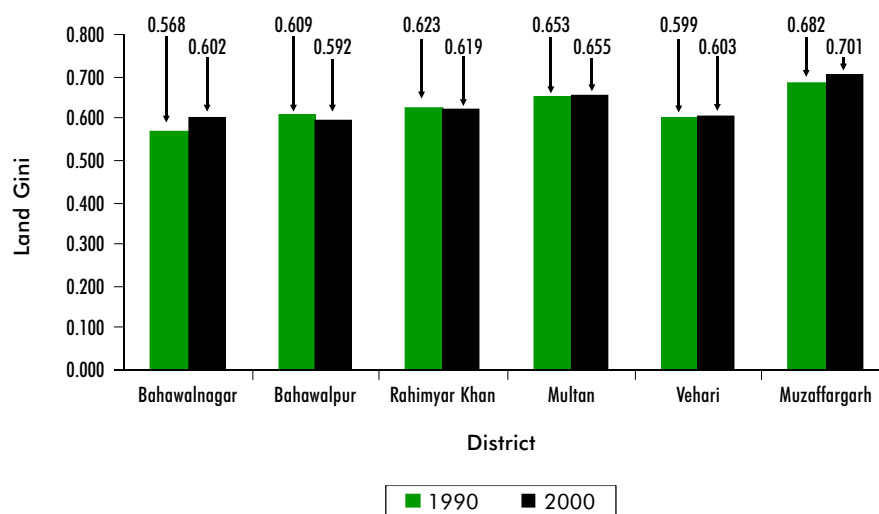
The pattern of distribution varies across provinces. For example, in Sindh, owner-operated farms are larger while tenant-operated farms are smaller. Similarly, in Balochistan, a larger proportion of farms are owner-operated as compared to other provinces, indicating that a considerable proportion of farm households are classified as small farmers.

Household surveys indicate significant differences between the poor and non-poor in terms of land ownership, operated land, and type of tenure. Marked differences have been found in Sindh and Balochistan (footnote 35). Recent data from the HIES for FY2002 indicates that, in Pakistan, 55% of the non-poor and 63% of the poor are landless (footnote 1). A majority of the poor owns less than 5 acres of land. The proportion of landless households among the poor is highest in central Punjab (74%) followed by northern Punjab (72%), and Balochistan (71%). According to the World Bank (2002), the poverty headcount for households owning less than 1 hectare is 35%, while for the landless, it is 40% (footnote 16).

In the cotton/wheat regions where poverty is highest, the Gini coefficient for land ownership is also very high.

In the cotton/wheat regions where poverty is highest, the Gini coefficient for land ownership is also very high. The highest incidence of land inequality is found in Muzaffargarh (0.70), followed by Multan (0.65). In addition to these districts, Rahimyar Khan and Vehari, the other cotton-producing districts, also exhibit highly unequal (0.62 and 0.60) land distribution (Figure 5).

Figure 5: Land Distribution in Selected Cotton-Producing Districts of Punjab



Sources: Government of Pakistan. *Census of Agriculture*. Issues for 1990 and 2000. Islamabad: Economic Affairs and Statistics Division/Agriculture Census Organization.

The proportion of sharecroppers is higher among poor households as compared to the non-poor.

The World Bank (2002) reports that the highly skewed distribution of land in rural Pakistan results in tenancy arrangements such as sharecropping that are detrimental to poverty reduction (footnote 16). The high incidence of sharecropping is confirmed by data from the Agricultural Census (Appendix 1). Nearly 67% of tenant-operated area was under sharecropping in 2000. This holds for small and medium sized farms also, whereas lease arrangements are found to be more common on large farms. The incidence of sharecropping is very common in Sindh where nearly 17% of the total operated area was under sharecropping in 2000. The incidence of sharecropping is common on small and medium sized farms in all the provinces. While in Punjab and Sindh, most large farms operate under fixed-rent lease agreements, NWFP exhibits a reverse pattern. In Balochistan, tenancy arrangements other than fixed rent and sharecropping have increased in recent years.

The available household survey data reveal that the proportion of sharecroppers is higher among poor households as compared to the non-poor, especially in Sindh and Balochistan (footnote 35). Fixed-rent tenancy is found to be common among the poor in central and southern Punjab and NWFP. A greater proportion of the non-poor are owners or owners-cum-tenants as compared to poor households. Similar instances are evident in the ownership of livestock by the poor and non-poor. For example, the FBS (2001) observes that the average value of animals owned by the non-poor is considerably higher than that of poor households (footnote 35). According to data from the HIES for FY2002, the ownership of livestock among non-farm households is common in most agro-climatic zones in Pakistan (footnote 1). However, in poorer zones such as the cotton/wheat zones of Punjab and Sindh, livestock ownership is found to be higher among farm households as compared to non-farm households.

These highly skewed land distribution patterns and tenancy arrangements indicate the presence of exploitative power structures in the rural areas of Pakistan. Given the unequal distribution of land, benefits arising from increased crop production will continue to accrue primarily to large farmers.

5 Poverty and Changes in the Rural Labor Market

5.1 Decline in Use of Casual Labor

The use of casual labor declined drastically during the 1990s. A decrease of nearly 9% in the number of farms reported to be using casual labor in the Agricultural Census of 2000 (footnote 46) was noted as compared to the 1990 census⁴⁷ (Table 19). An increase in family labor and in the number of owned farms is one reason for the decline in the reported use of casual labor. Increased mechanization may be another important factor but this is difficult to substantiate because of the inadequacy of data on the extent of mechanization. In any case, the decline in the percentage of farms reporting the use of casual labor is an indicator of the decline in the alternative employment opportunities so vital for keeping people out of poverty.

The decline in the percentage of farms reporting the use of casual labor is an indicator of the decline in the alternative employment opportunities so vital for keeping people out of poverty.

Table 19: Percentage Distribution of Farms Reporting Use of Casual Labor

Size of Farm (Acres)	1990	2000
< 1	36.32	27.28
1 to < 2.5	44.57	36.32
2.5 to < 5	50.28	43.70
5 to < 7.5	54.81	46.31
7.5 to < 12.5	55.99	48.03
12.5 to < 25	56.15	48.47
25 to < 50	55.61	49.78
50 to < 150	54.57	50.38
150 and >	57.80	51.93
All Farms	50.42	41.76

Sources: Government of Pakistan. *Census of Agriculture*. Issues for 1990 and 2000. Islamabad: Economic Affairs and Statistics Division/Agriculture Census Organization.

⁴⁷ Government of Pakistan. 1993. *Census of Agriculture 1990*. Islamabad: Economic Affairs and Statistics Division/Agriculture Census Organization.

5.2 Decline in Real Wage Rate in the 1990s

According to the Agricultural Census for 2000, the extent of the use of hired labor on tenant farms is negligible (footnote 46). Unpaid family helpers constitute a large majority of the rural labor force and are generally concentrated in the farm sector. In FY2002, almost 35% of the rural labor force comprised unpaid family helpers. The proportion of permanent hired labor is quite low in the agriculture sector, while that of casual labor is even lower. According to the Agricultural Census for 1990, a large majority of the agricultural labor force consists of family workers (72%) and tenant farmers (25%); the share of permanent hired labor was only 2% and that of casual workers was just 0.79% (footnote 47). It is usually at harvest time that labor is hired; farmers do not tend to hire workers during cultivation.⁴⁸

The available data indicate that real wages have also declined significantly for regular workers and only increased marginally for casual workers.

As already discussed, the use of casual labor has declined across farm size as well as different categories of tenure. The available data indicate that real wages have also declined significantly for regular workers and only increased marginally for casual workers (Table 20). Data for the period after FY1997 are not available to evaluate recent trends.

Table 20: Nominal and Real Daily Wages for Agricultural Laborers

Year	Nominal Wages (PRs)		Real Wages (PRs)		CPI FY1991=100
	Regular Workers	Casual Workers	Regular Workers	Casual Workers	
FY1991	37.13	35.81	37.13	35.81	100.00
FY1992	39.01	41.75	35.28	37.76	110.58
FY1993	42.43	41.59	34.94	34.24	121.45
FY1994	44.25	53.21	32.74	39.37	135.14
FY1995	52.07	56.00	34.09	36.67	152.73
FY1996	55.93	62.87	33.05	37.16	169.21
FY1997	58.99	72.3	31.18	38.22	189.18
Growth Rate (%) per Annum	9.84	12.65	(1.45)	1.11	14.86

CPI = consumer price index, FY = fiscal year.

Sources: Government of Pakistan. *Household Integrated Economic Survey*. Various issues. Islamabad: Federal Bureau of Statistics.

⁴⁸ Fafchamps, Marcel, and Agnes R. Quisumbing. 1998. Human Capital, Productivity, and Labor Allocation in Rural Pakistan. FCND Discussion Paper No. 48. IFPRI, Washington, DC.

However, the proportion of wage workers is quite high in the non-farm sector. Unpaid family helpers constitute a very small proportion of the labor force in this sector. Most rural activities in this category, however, fall under self-employment and small businesses (footnote 17).

The non-farm sector comprises a formal and informal sector. The informal sector is labor-intensive, and requires little or no formal training or physical capital. Due to these easy entry requirements, a majority of uneducated and unskilled workers are absorbed by this sector. Working conditions are extremely dismal, and although the sector absorbs a large majority of the labor force, poor working conditions combined with the absence of any employment benefits do not improve workers' living standards to any considerable degree. The formal sector comprises registered firms where employment is provided either on a permanent or contractual basis. Labor laws apply to such organizations and their workers enjoy all the benefits that apply accordingly.

Using construction work as a proxy for rural non-farm labor indicates that nominal wages in the sector have increased considerably, while real wages declined during the 1990s (Table 21). Falling real wages among construction workers in the non-farm sector coupled with a high dependency ratio has worsened living conditions for laborers. On the other hand, farm wages, too, have declined for permanent labor, while casual labor wages have increased only marginally.

Falling real wages among construction workers in the non-farm sector coupled with a high dependency ratio has worsened living conditions for laborers.

Table 21: Nominal and Real Daily Wages for Construction Workers

Year	Nominal Wages (PRs)		Real Wages (PRs)		CPI FY2001=100
	Carpenter	Laborer	Carpenter	Laborer	
FY1991	121.44	57.81	281.11	133.82	43.20
FY1992	139.86	61.96	294.99	130.70	47.41
FY1993	149.96	70.82	288.00	136.01	52.07
FY1994	159.07	76.32	274.55	131.72	57.94
FY1995	180.00	87.86	274.89	134.18	65.48
FY1996	194.07	100.28	267.49	138.22	72.55
FY1997	210.73	108.73	259.81	134.06	81.11
FY1998	225.28	116.50	257.61	133.22	87.45
FY1999	244.61	125.42	264.56	135.65	92.46
FY2000	244.71	123.81	255.49	129.26	95.78
FY2001	250.77	126.27	250.77	126.27	100.00
FY2002	252.12	129.92	243.50	125.48	103.54
Growth Rate	6.87	7.64	(1.30)	(0.58)	

CPI: consumer price index, FY = fiscal year.

Note: Nominal wages have been calculated as the average of wages in five major cities.

Source: Computed from data in Government of Pakistan. 2003. *Pakistan Economic Survey 2002–03*. Islamabad: Economic Advisor's Wing/Finance Division.

However, existing evidence indicates that the use of casual labor in agriculture has declined significantly. These negative wage trends in the farm and non-farm sectors reflect increasing poverty among wage workers in both sectors.

6 Conclusions and Policy Recommendations

The agriculture sector in Pakistan is considered a major determinant of overall economic growth and the well-being of people because of its significant contribution to GDP, export earnings, employment, and food availability. Agricultural growth helps reduce poverty directly through an increase in farmers' income. The indirect effect of agricultural growth on poverty reduction occurs through the spending of farmers' income on locally produced non-agricultural goods. The relevant literature argues that the increased demand for these goods leads to a much larger increase in employment, which is the main vehicle for poverty reduction in rural areas. However, in the case of Pakistan, the reasonable agricultural growth in the 1990s could not be translated into poverty reduction. Rather, the consensus is that the percentage of rural persons living below the poverty line has increased over time and especially since the late 1990s.

It appears that the interplay of several factors caused this paradox. The growth in agricultural production was not sustained in a number of years during the 1990s. Poor agricultural production in one year may push households into transitory poverty, while one good year may not be sufficient to pull them out. The inability of small farmers to diversify crop production, particularly in the cotton/wheat belt of Sindh and southern Punjab where poverty is relatively high, also contributed to an increase in rural poverty. Moreover, in the presence of a highly skewed land distribution, the benefits arising from agricultural growth in the 1990s did not reach small farmers and sharecroppers, instead accruing primarily to large farmers.

A substantial decline in the use of casual labor and real wages in the 1990s are other important determinants of the persistent high rural poverty in question. Employment opportunities in the rural non-agriculture sector are inadequate. Income from this sector is derived from many diverse activities. The poor tend to be found in low-productivity activities that demand low levels of skill and little education; whereas within wage work, the poor are generally involved in unskilled labor in the construction sector.

In the presence of a highly skewed land distribution, the benefits arising from agricultural growth in the 1990s did not reach small farmers and sharecroppers.

The major recommendations of this study are as follows:

A reduction in chronic poverty is possible through large and sustained growth in household incomes.

- (i) Agricultural growth without specific interventions targeting small farmers and rural non-farm households, may not alleviate poverty for much of the poor in rural Pakistan. An explicit strategy is needed for the development of the rural non-agriculture sector, and is currently lacking in the Government of Pakistan's Poverty Reduction Strategy Papers as well as development plans.
- (ii) In view of the relatively high incidence of poverty in the cotton/wheat zones of Punjab and Sindh, a poverty reduction strategy focusing on education, skills development, job creation, and health care needs to be designed for these areas. Given that land distribution is highly skewed in these zones, it is necessary to concentrate more on income sources that are independent of land in order to reduce rural poverty. This suggests providing landless and small farmers with easy access to credit, technology, and information.
- (iii) Transitory poverty can be reduced if policy interventions aim at leveling out income fluctuations. A reduction in chronic poverty is possible through large and sustained growth in household incomes. For the former, the availability of micro-credit would be an effective tool, while for the latter, targeted public works programs could help reduce chronic poverty.
- (iv) Poverty reduction is linked strongly to employment. The exploitation of labor in situations of poor governance and thin, inadequate labor markets is a major cause of increasing poverty. The fact that rural real wages actually declined in Pakistan despite significant external and internal out-migration during the 1980s bears testimony to the fact that there is no minimum wage protection in the rural sector. In addition, the legislative framework for the protection of workers does not apply, as these laws do not apply to the agriculture sector. Agricultural labor is thus deprived of benefits such as social security and old-age pension benefits. Minimum wage laws need to be set for the agriculture sector and all legislation, including workers' protection and non-wage benefits, made applicable to the agriculture sector.
- (v) The Government has followed an interventionist pricing policy for the agriculture sector. Although these pricing policies have been designed to favor small farmers, studies argue that they achieve the opposite. Such policies should be revised for the benefit of small farmers.
- (vi) The available evidence also shows that increased resource degradation has led to declining productivity in agriculture. A

comparison of Indian and Pakistani Punjab shows that higher productivity has been achieved in the former, mainly due to greater efforts to tackle resource degradation. Greater efforts need to be directed towards the conservation of natural resources. One measure in this regard would be to educate and encourage farmers through incentives to move to more sustainable practices such as diversified crop rotation and the cultivation of legumes.

(vii) Finally, research on the linkages between agricultural growth, rural development, and poverty reduction requires more disaggregated data at various levels. It is necessary for the Government to mobilize additional resources for data collection and to coordinate the existing sources of data collection to maximize synergies. These data gaps are also reflected in the gaps in existing and ongoing research (Appendix 2). Key areas requiring further research include:

- (a) A more comprehensive and disaggregated analysis of trends in rural poverty using region-specific poverty lines estimated on a scientific basis;
- (b) An analysis of the dynamic aspects of rural poverty and its determinants;
- (c) An analysis of the private and public incomes of the poor and the variations in these;
- (d) An evaluation of the efficiency of publicly provided goods and services in reaching the rural poor, especially the recent measures addressing the vulnerability of the poor under the Poverty Reduction Strategy Papers.

Research on the linkages between agricultural growth, rural development, and poverty reduction requires more disaggregated data at various levels.

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APPENDIXES

APPENDIX 1: BACKGROUND ECONOMIC DATA

Table A1.1: Agro-Climatic Zones of Pakistan

Agro-Climatic Zone	Districts
Rice/Wheat Punjab	Sialkot, Gujrat, Gujranwala, Sheikhpura, Lahore, Kasur, Narowal, Mandi Bahauddin, Hafizabad
Mixed Punjab	Sargodha, Khushab, Jhang, Faisalabad/Toba Tek Singh, Okara
Cotton/Wheat Punjab	Sahiwal, Bahawalnagar, Bahawalpur, Rahimyar Khan, Multan, Vehari, Lodhran, Khanewal, Pakpattan
Low-Intensity Punjab	Dera Ghazi Khan/Rajanpur, Muzaffargarh/Layyah, Mianwali, Bhakkar, Dera Ismail Khan
Barani (Rain-Fed) Punjab	Attock, Jhelum, Rawalpindi, Islamabad, Chakwal
Cotton/Wheat Sindh	Sukkur, Khairpur, Nawabshah, Hyderabad, Tharparkar, Nowshero Feroz, Ghotki, Umerkot, Mirpur Khas, Sanghar
Rice/Other Sindh	Jacobabad, Larkana, Dadu, Thatta, Badin, Shikarpur, Karachi
Other North-West Frontier Province (NWFP)	All NWFP except Dera Ismail Khan
Other Balochistan	All Balochistan

Source: Pickney, Thomas C. 1989. The Demand for Public Storage of Wheat in Pakistan. Research Report 77. International Food Policy Research Institute, Washington, DC.

Table A1.2: Share of Different Agro-Climatic Zones and Households by Poverty Status and Different Income Sources

Agro-Climatic Zone	Poverty Status	Wages and Salaries	Transfer Income	Crop Income	Rental Income	Livestock Income	Total Income
Rice/Wheat Punjab	Poor	6.56	3.01	1.86	3.27	2.67	3.71
	Non-Poor	10.24	15.55	12.61	30.39	11.80	12.38
	Total	16.80	18.56	14.47	33.66	14.47	16.09
Mixed Punjab	Poor	5.45	4.44	2.73	3.06	9.49	4.03
	Non-Poor	6.24	10.67	6.62	12.70	10.16	7.10
	Total	11.69	15.11	9.35	15.76	19.65	11.13
Cotton/Wheat Punjab	Poor	7.85	2.82	7.71	2.68	8.58	7.14
	Non-Poor	5.52	5.83	15.80	15.04	13.87	10.96
	Total	13.37	8.65	23.50	17.72	22.44	18.10
Low-Intensity Punjab	Poor	4.18	2.91	4.34	2.66	6.78	4.14
	Non-Poor	3.02	3.55	4.94	8.05	5.32	4.16
	Total	7.19	6.47	9.28	10.71	12.10	8.30
Barani Punjab	Poor	1.74	1.66	0.29	0.00	0.51	0.96
	Non-Poor	5.42	10.17	0.89	0.14	1.27	3.54
	Total	7.16	11.83	1.18	0.14	1.78	4.50
Cotton/Wheat Sindh	Poor	6.86	0.64	11.15	0.23	5.78	8.16
	Non-Poor	6.30	1.09	10.39	5.03	4.12	7.68
	Total	13.16	1.73	21.54	5.26	9.90	15.84
Rice/Other Sindh	Poor	4.39	0.48	6.00	0.48	1.09	4.62
	Non-Poor	5.92	1.22	5.97	2.44	3.56	5.32
	Total	10.31	1.70	11.97	2.92	4.66	9.94
North-West Frontier Province	Poor	5.63	11.63	2.12	3.29	3.82	4.49
	Non-Poor	7.44	22.73	2.78	9.55	4.78	6.82
	Total	13.07	34.36	4.90	12.83	8.60	11.31
Balochistan	Poor	2.62	0.22	1.37	0.00	1.52	1.67
	Non-Poor	4.62	1.36	2.43	1.01	4.89	3.12
	Total	7.24	1.59	3.80	1.01	6.41	4.79
Rural Pakistan	Poor	45.28	27.82	37.57	15.66	40.23	38.92
	Non-Poor	54.72	72.18	62.43	84.34	59.77	61.08
	Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Computed from data in Government of Pakistan. 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics.

Table A1.3: Sources of Income Across Agro-Climatic Zones and Size of Operated Land Holding

Size of Operated Land Holding by Agro-Climatic Zone	Wages and Salaries	Transfer Income	Crop Income	Rental Income	Livestock Income	Monthly Income	Households (%)
No Land							
Rice/Wheat Punjab	73.75	20.42	2.61	2.00	1.21	100.00	16.95
Mixed Punjab	69.09	27.16	0.95	0.74	2.07	100.00	14.73
Cotton/Wheat Punjab	83.80	13.32	0.76	0.18	1.94	100.00	16.10
Low-Intensity Punjab	76.31	21.95	0.00	0.00	1.74	100.00	8.66
Barani Punjab	70.41	29.11	0.06	0.00	0.42	100.00	6.56
Cotton/Wheat Sindh	90.69	3.79	3.30	0.00	2.22	100.00	11.41
Rice/Other Sindh	91.79	4.65	1.86	0.22	1.48	100.00	7.29
North-West Frontier Province	55.62	42.06	0.17	1.75	0.40	100.00	12.63
Balochistan	89.14	6.37	2.43	0.00	2.05	100.00	5.67
Rural Pakistan	76.25	20.11	1.43	0.74	1.47	100.00	100.00 (56.61)
Up to 1 acre							
Rice/Wheat Punjab	52.62	21.38	23.20	2.25	0.55	100.00	10.30
Mixed Punjab	47.25	17.22	25.22	3.38	6.93	100.00	11.65
Cotton/Wheat Punjab	50.90	10.38	34.68	0.00	4.04	100.00	17.65
Low-Intensity Punjab	48.71	18.62	29.27	1.05	2.35	100.00	8.89
Barani Punjab	60.26	19.09	15.65	0.00	4.99	100.00	6.93
Cotton/Wheat Sindh	58.87	0.42	40.72	0.00	0.00	100.00	1.14
Rice/Other Sindh	81.09	0.00	18.91	0.00	0.00	100.00	0.16
North-West Frontier Province	37.98	33.41	26.16	0.57	1.87	100.00	43.29
Rural Pakistan	45.46	24.07	26.73	1.00	2.73	100.00	100.00 (5.12)
Up to 5 acres							
Rice/Wheat Punjab	28.42	8.98	55.09	4.91	2.61	100.00	14.16
Mixed Punjab	22.61	10.32	59.27	1.76	6.04	100.00	12.25
Cotton/Wheat Punjab	18.80	3.23	73.58	0.82	3.57	100.00	20.15
Low-Intensity Punjab	15.65	3.35	72.38	5.27	3.35	100.00	8.26
Barani Punjab	38.32	30.66	29.83	0.08	1.11	100.00	5.54
Cotton/Wheat Sindh	16.32	1.12	78.90	3.27	0.38	100.00	7.47
Rice/Other Sindh	22.98	1.59	73.87	0.51	1.05	100.00	10.13
North-West Frontier Province	29.50	27.23	38.32	3.13	1.82	100.00	20.94
Balochistan	13.59	0.82	84.44	0.00	1.16	100.00	1.11
Rural Pakistan	23.44	10.31	61.16	2.53	2.56	100.00	100.00 (18.01)
Up to 12.5 acres							
Rice/Wheat Punjab	9.33	8.53	78.47	1.35	2.32	100.00	13.24
Mixed Punjab	9.63	2.51	77.61	6.04	4.22	100.00	10.55
Cotton/Wheat Punjab	7.81	4.01	83.40	2.10	2.68	100.00	18.55
Low-Intensity Punjab	7.60	3.02	82.37	3.45	3.56	100.00	12.55
Barani Punjab	10.38	34.83	53.88	0.34	0.57	100.00	3.15
Cotton/Wheat Sindh	8.16	0.13	90.35	0.39	0.96	100.00	17.05

Note: Figures in parentheses represent the proportion of households in that category relative to total rural households.

Source: Computed from data in Government of Pakistan. 2003. *Household Integrated Economic Survey 2001–02*. Islamabad: Federal Bureau of Statistics.

Continued on next page

Table... Continued

Size of Operated Land Holding by Agro-Climatic Zone	Wages and Salaries	Transfer Income	Crop Income	Rental Income	Livestock Income	Monthly Income	Households (%)
Rice/Other Sindh	12.48	0.44	86.35	0.26	0.48	100.00	13.81
North-West Frontier Province	18.25	19.59	56.67	1.13	4.36	100.00	6.15
Balochistan	9.80	0.15	86.23	0.28	3.54	100.00	4.96
Rural Pakistan	9.40	4.33	82.44	1.64	2.20	100.00	100.00 (13.95)
More Than 12.5 acres							
Rice/Wheat Punjab	1.89	4.63	83.84	8.49	1.15	100.00	12.68
Mixed Punjab	4.91	3.58	85.69	3.59	2.23	100.00	12.39
Cotton/Wheat Punjab	3.45	1.49	90.71	3.07	1.28	100.00	19.57
Low-Intensity Punjab	7.40	0.19	88.07	1.87	2.47	100.00	17.02
Barani Punjab	21.11	9.61	69.28	0.00	0.00	100.00	2.01
Cotton/Wheat Sindh	3.87	0.15	95.13	0.15	0.71	100.00	15.26
Rice/Other Sindh	2.97	0.18	95.23	1.29	0.33	100.00	8.52
North-West Frontier Province	27.08	20.57	48.69	1.70	1.96	100.00	3.81
Balochistan	7.39	0.17	87.96	1.56	2.93	100.00	8.74
Rural Pakistan	4.54	2.06	89.10	2.95	1.35	100.00	100.00 (6.31)
All Households							
Rice/Wheat Punjab	37.39	12.85	44.50	3.61	1.65	100.00	15.32
Mixed Punjab	37.60	15.12	41.59	2.45	3.24	100.00	13.40
Cotton/Wheat Punjab	26.45	5.33	64.26	1.69	2.28	100.00	17.47
Low-Intensity Punjab	31.05	8.68	55.37	2.23	2.68	100.00	9.67
Barani Punjab	56.94	29.26	13.02	0.05	0.73	100.00	5.63
Cotton/Wheat Sindh	29.76	1.22	67.30	0.57	1.15	100.00	11.20
Rice/Other Sindh	37.14	1.90	59.59	0.51	0.86	100.00	8.42
North-West Frontier Province	41.38	33.84	21.43	1.96	1.40	100.00	14.24
Balochistan	54.16	3.69	39.33	0.36	2.46	100.00	4.65
Rural Pakistan	35.81	11.14	49.49	1.73	1.84	100.00	100.00 (100.00)

Table A1.4: Percentage Share of Important Crops in Total Major Crops

Crop	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
All Major Crops	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Food Crops	45.67	51.32	53.02	53.17	51.23	53.76	54.08	54.65	55.55	53.96	52.42
Rice	11.66	12.50	15.84	13.52	14.31	16.57	15.02	16.80	16.43	16.65	15.61
Wheat	27.05	31.79	30.03	31.36	28.74	29.41	30.63	29.24	32.13	30.53	29.85
Barley	0.28	0.36	0.33	0.34	0.34	0.31	0.33	0.26	0.20	0.18	0.17
Oats (<i>Jowar</i>)	0.49	0.59	0.52	0.60	0.54	0.48	0.47	0.47	0.40	0.44	0.45
Millet (<i>Bajra</i>)	0.41	0.69	0.46	0.71	0.47	0.45	0.60	0.60	0.39	0.55	0.60
Maize	2.67	2.99	3.03	3.08	2.79	2.86	2.63	3.49	3.10	3.38	3.44
Gram	3.11	2.40	2.81	3.56	4.04	3.68	4.40	3.99	2.89	2.23	2.30
Fiber Crops											
Cotton	38.93	31.37	27.53	27.80	31.57	29.11	26.42	25.22	28.80	30.24	30.07
Cash Crops											
Sugarcane	13.08	14.61	16.86	16.71	14.93	14.45	16.93	17.54	13.20	13.61	15.09
All Other Crops	2.32	2.70	2.59	2.32	2.27	2.68	2.57	2.59	2.36	2.19	2.43
Rapeseed and Mustard	0.87	0.94	0.88	0.96	0.99	1.16	1.10	1.06	0.97	0.85	0.96
Sesamum	0.19	0.26	0.25	0.26	0.26	0.31	0.27	0.20	0.20	0.32	0.44
Tobacco	1.26	1.50	1.46	1.10	1.02	1.21	1.20	1.33	1.18	1.02	1.03

FY = fiscal year.

Source: Government of Pakistan. 2003. *Pakistan Economic Survey 2002–03*. Islamabad: Economic Advisor's Wing/Finance Division.

Table A1.5: Yield per Hectare of Major Crops (Tons/Hectare)

Year	Wheat	Rice	Sugarcane	Cotton	Tobacco	Millet (<i>Bajra</i>)	Oats (<i>Jowar</i>)	Maize
FY1991	1.84	1.54	40.71	0.61	1.70	0.40	0.57	1.40
FY1992	1.99	1.55	43.38	0.77	1.80	0.44	0.59	1.42
FY1993	1.95	1.58	43.00	0.54	1.76	0.42	0.59	1.36
FY1994	1.89	1.83	46.13	0.49	1.75	0.46	0.58	1.38
FY1995	2.08	1.62	46.75	0.56	1.72	0.45	0.60	1.48
FY1996	2.02	1.83	46.97	0.60	1.74	0.40	0.61	1.60
FY1997	2.05	1.91	43.52	0.51	1.88	0.48	0.59	1.61
FY1998	2.24	1.87	50.28	0.53	1.85	0.46	0.59	1.63
FY1999	2.17	1.93	47.78	0.51	1.91	0.46	0.60	1.73
FY2000	2.49	2.05	45.87	0.64	1.93	0.50	0.62	1.72
FY2001	2.33	2.02	45.38	0.62	1.85	0.51	0.62	1.74
FY2002	2.26	1.84	48.04	0.58	1.92	0.52	0.62	1.77
FY2003 ^a	2.38	2.01	47.93	0.62	1.92	0.60	0.62	1.81

FY = fiscal year.

^a Indicates July–March.

Source: Government of Pakistan. 2003. *Pakistan Economic Survey 2002–03*. Islamabad: Economic Advisor's Wing/Finance Division.

Table A1.6: Percentage Distribution of Tenant-Operated Area Under Different Tenancy Arrangements

Size of Farm (Acres)	1990			2000		
	Sharecropped Area	Leased Area	Other Area	Sharecropped Area	Leased Area	Other Area
Pakistan	66.2	30.7	3.0	67.5	28.7	3.8
< 5	76.6	21.3	2.1	75.3	23.4	1.3
5 to < 12.5	79.3	18.9	1.8	75.2	23.5	1.3
12.5 to < 25	72.8	25.7	1.5	71.5	26.9	1.6
25 to < 50	68.4	29.8	1.8	68.0	29.6	2.4
50 to < 150	57.4	39.3	3.3	67.5	29.7	2.9
> 150	42.9	49.4	7.5	47.4	39.2	13.4
Punjab	62.6	34.0	3.4	62.9	35.1	2.0
< 5	67.7	28.2	4.1	64.1	32.9	3.0
5 to < 12.5	74.0	24.6	1.4	66.9	31.5	1.5
12.5 to < 25	71.5	27.2	1.3	64.2	34.0	1.7
25 to < 50	65.3	32.7	2.1	63.5	34.6	2.0
50 to < 150	53.5	43.0	3.5	64.2	34.3	1.5
> 150	43.6	48.2	8.2	54.6	43.3	2.1
Sindh	56.6	41.3	2.1	65.7	32.1	2.2
< 5	95.5	4.4	0.2	72.1	27.7	0.2
5 to < 12.5	88.5	9.3	2.2	89.3	10.3	0.4
12.5 to < 25	67.2	31.0	1.7	82.8	15.2	2.0
25 to < 50	46.7	52.1	1.2	66.4	26.9	6.8
50 to < 150	27.4	69.2	3.3	59.6	37.5	2.8
> 150	14.0	81.5	3.9	24.2	74.6	1.2
North-West Frontier Province	80.8	16.6	2.6	80.3	17.9	1.8
< 5	63.8	31.7	4.5	72.3	25.6	2.1
5 to < 12.5	70.8	26.9	2.3	67.2	31.4	1.5
12.5 to < 25	79.6	17.7	2.8	70.5	25.9	3.6
25 to < 50	92.0	7.3	0.7	82.5	15.9	1.6
50 to < 150	91.0	6.9	2.1	91.3	7.3	1.4
> 150	87.4	9.5	3.1	98.0	1.4	0.6
Balochistan	87.6	8.4	4.0	84.3	6.0	9.8
< 5	88.8	7.7	3.5	98.2	1.7	0.2
5 to < 12.5	95.0	3.5	1.5	93.9	5.7	0.4
12.5 to < 25	95.1	3.3	1.6	97.5	1.9	0.6
25 to < 50	89.4	8.8	1.8	94.3	2.9	2.8
50 to < 150	82.3	14.5	3.1	69.4	16.1	14.5
> 150	75.1	12.3	12.6	52.2	7.5	40.3

Sources: Government of Pakistan. *Census of Agriculture*. Issues for 1990 and 2000. Islamabad: Economic Affairs and Statistics Division/Agriculture Census Organization.

APPENDIX 2: DATA AND RESEARCH GAPS

As a major sector of the economy, agriculture plays an important role in providing employment, ensuring food and nutritional security, increasing foreign exchange earnings, reducing trade deficit, and enhancing industrial development, thereby improving overall economic growth and reducing the incidence of poverty. While Mellor (2001) maintains that agricultural growth is the main engine for rural development,¹ his emphasis that the most significant impact on rural poverty occurs through the employment multipliers generated by farm to non-farm linkages heightens the need for a comprehensive analysis of the rural development process in Pakistan.

Studies on the non-farm sector in Pakistan are few and far between, although Alderman and Garcia's study (1993) based on the International Food Policy Research Institute (IFPRI) panel data found that non-farm income was, by the late 1980s, the leading source of earnings for rural households, i.e., those covered by the IFPRI sample.² This result implied that some income diversification had occurred in rural Pakistan, veering income away from crop income as its major source. This diversification resulted in different activities with varying rates of return. While some farmers engaged in low-paying artisan activities, others invested in transport and business. The study by Alderman and Garcia (1993) is now 10 years old. While the importance of agricultural growth in shaping the rural economy as well as the rural non-farm sector cannot be understated, a broader understanding of rural development strategies that include activities beyond the agricultural domain is urgently needed.

The present study finds that the growth of the agriculture sector has not been as high during the 1990s as it appears in the official statistics. The existing data gaps have limited research into finding more precise and appropriate policy-relevant answers. For example, in Pakistan, high rural

¹ Mellor, John W. 2001. Employment Multiplier from Agricultural Growth and Poverty Reduction. *Pakistan Development Review* 40 (4).

² Alderman, H., and M. Garcia. 1993. Poverty, Household Security, and Nutrition in Rural Pakistan. Research Report 96. IFPRI, Washington, DC.

poverty is the result of a higher incidence of transitory poverty. The limited research available on chronic and transitory poverty indicates different determinants for each and, therefore, implies different policy measures to reduce poverty. Further analysis is limited by the absence of more recent panel data. With the changes occurring in policy approaches towards poverty, inequality, and growth, the need for disaggregated and more in-depth data has increased considerably. The existing data gaps make it extremely difficult to trace trends in the impact of various macroeconomic indicators, and even more difficult to juxtapose them with policy initiatives in order to observe the impact that a particular policy may have had. The availability of appropriate data is the crux of effective policy formulation, and analyzing economic or social performance is impossible without it. Moreover, not only is it necessary to increase the scope of data collection, but also to improve the quality of the existing database and surveys.

Data Gaps

Although numerous studies cite the lack of data as a major reason for incomplete analysis, there have been very few studies examining the scope of data needs itself. Malik (1993) lists numerous discrepancies that may arise in gathering farm production data from rural household surveys.³ He points to the biases that may arise due to “sample selection, questionnaire design, type of information elicited, how and where information is collected, and inadequate training of enumerators”. One of the most important considerations in maintaining consistency in collecting data from survey-related work is the definition of various concepts. For instance, what would be defined as the scope of 'farm activity'? Would it include marketing or be restricted to production? It is necessary to define clearly such issues in the data sources available.

The available quantitative data sources, and their advantages and limitations are presented in Table A2.1 below. Among the nationally representative datasets mentioned, the Household Integrated Economic Survey (HIES) provides information on the various dimensions of poverty.⁴ This survey, however, lacks detailed information on agricultural and non-agricultural activities. The Agricultural Census and Agricultural Statistics, on the other hand, provide detailed information on agriculture, cropping pattern, input used, irrigation, marketing, mechanization, credit, etc., but fail to provide measurements of income and expenditure. Thus, one cannot analyze the characteristics of poor and

³ Malik, S. J. 1993. Farm Production Data in Rural Household Surveys. In *Data Needs for Food Policy in Developing Countries: New Directions for Household Surveys* edited by Joachim von Braun and Detlev Puetz. Washington, DC: IFPRI.

⁴ Recently, the HIES and Pakistan Integrated Household Surveys were combined to provide detailed information on income and non-income indicators of poverty.

non-poor households against the backdrop of a particular trend of agricultural growth.

The available literature indicates that modern technology in agriculture resulted in labor displacement and in the absence of non-farm employment in rural areas, any agricultural growth that occurred could not be translated into effective poverty reduction. However, in order to examine comprehensively the agricultural growth-rural poverty-employment nexus, it is necessary to examine the variables related to formal and informal employment, the nature of employment, working hours, and wage rates etc. This information is currently not compiled in one place in the Income and Expenditure Surveys.

A fuller understanding of the linkages between agricultural growth and poverty also requires information collated in one source on various aspects of agricultural growth, including the performance of major and minor crops as well as livestock, the quality of soil, nature and type of tenure, and trends in investment and prices, etc., so that households can be classified by agro-climatic zone, economic activity, and poverty status. In addition, despite its importance, the land market in Pakistan is not well developed. Excessive land fragmentation and the subdivision of landholdings from generation to generation have caused a persistent decline in agricultural productivity. Security of land tenure is crucial for the growth of the agriculture sector and affects both potential and actual production and productivity, as well as the possibilities of agricultural growth playing its due role in poverty reduction. This highlights the importance of having appropriate data available on land disputes, formal land titles, and rights to buy or sell land, etc.

Various studies have found a positive relationship between the nutritional status of adults and earned income. Poor nutritional status is directly related to food intake. External shocks and the resulting fall in incomes are directly related to food insecurity that affects poor households worse than others. Thus, data on nutritional indicators would provide an additional insight in understanding the dynamic nature of poverty and its link with food security and agricultural production.

The following data gaps are particularly noticeable in the data sources available in Pakistan:

- (i) Number of hours worked under different farm and non-farm activities,
- (ii) Nature of employment—casual or permanent,
- (iii) Hourly wage rate by activity and nature of employment,
- (iv) Nature of existing non-farm activities—formal and informal,
- (v) Land titles,

Table A2.1: Advantages and Limitations of Available Quantitative Data Sources

No.	Surveys	Advantages	Limitations
1	Census of Agriculture	Provides detailed information on number and size of farms, type of tenure, cropping patterns, cropping intensity, use of labor, sources of income, etc.	Lack of data on income and expenditure limits the scope of analyzing poverty based on the different characteristics of farm households.
2	Agricultural Statistics	Provide data on crop production, mechanization, farm credit, etc.	Do not provide data on income and expenditure.
3	International Food Policy Research Institute Panel Survey	Provides detailed information on income, expenditure, farm area, production, input usage, marketing, credit, and livestock, as well as disaggregated data on education, health, nutrition, and employment.	Covers only four districts in all of Pakistan; spans a short period of only 6 years with 14 visits to the same household.
4	Pakistan Rural Household Surveys	Provide detailed information on farm size by plot, production, input use, and tenure type on each plot, tenancy history, land titling, irrigation, credit, livestock, income, expenditure, education, health, nutrition, dowry, and inheritance, etc.	Access to data is restricted.
5	Household Integrated Economic Surveys	Provide detailed information on income and expenditure, education, population welfare, family planning, health, and housing.	Provide only limited data on agricultural and non-agricultural activities.
6	Pakistan Integrated Household Surveys	Provide detailed information on non-income measures of poverty such as education, health, family planning, housing, water and sanitation, etc.	Lack of data on income and expenditure limits the use of poverty measurement and diagnostics.
7	Rural Credit Surveys	Provide detailed information on size of farm, type of tenure, sources of credit, purpose of loan, duration of loan, mark-up rate, etc.	Do not provide information on income and expenditure.
8	Population Census	Provides information on the basic characteristics of the total population, including education, occupation, and housing, etc.	Does not provide information on income, expenditure, agricultural production, and employment activities.
9	Labour Force Surveys	Provide information on the labor force, employment, unemployment, under-employment, and employment status. All data is disaggregated on the basis of gender and rural/urban areas.	Provides very little information on employment and under-employment in the informal sector.
10	Pakistan Economic Surveys	Provide time-series data on the aggregated agricultural sector, including area under the production of different crops, mechanization, credit, etc.	Useful only in examining trend analysis.

Source: Author's appraisal.

- (vi) Income mobility—elements of chronic and transitory poverty,
- (vii) Nutrition indicators, such as height and weight.

Apart from the IFPRI Panel Survey and the Pakistan Rural Household Survey, none of the sources listed in Table A 2.1 provide data on the number of hours worked on different activities in agriculture and non-agriculture. The Pakistan Rural Household Survey for the fiscal year (FY) 2002 made an effort to collect this information, but it has not been made available to Pakistani researchers as yet.

Ideally, longitudinal socio-economic information should be collected at the household level from a sample of households selected as representative of the agro-climatic zones. This information should be spliced with existing district level incomes to provide detailed poverty profiles as well as an analysis of the determinants of poverty over time.

Research Gaps

Gaps in data translate into gaps in research. Although numerous studies in Pakistan have determined poverty trends in Pakistan, their connection with agricultural growth has not been studied in detail. Given the lack of appropriate data, studies have considered agricultural productivity and rural poverty as separate issues. For instance, the study by Ali and Byerlee (2002) computed partial factor productivity for land, labor, water, and total factor productivity for the crop and livestock sectors in irrigated Punjab.⁵ The growth rates for factor productivities were then calculated for three periods, namely the 'green revolution', 'intensification', and 'post-green revolution' period. Unfortunately, data on poverty for every year of this analysis was not available, and the study failed to establish the crucial linkage between poverty trends in these three periods and trends in factor productivities.

Most available studies have focused on overall poverty trends in Pakistan. While this is a useful exercise in itself, there is a noticeable gap in the literature as far as regional and provincial poverty trends are concerned. Poverty is a multi-faceted phenomenon and cannot be studied in its entirety unless regional, agro-climatic, and social differences are taken into account. Moreover, the more recent studies that disaggregate poverty by regions or agro-climatic zone use only one poverty line generally updated from a previous year estimate by using a price indicator. This seriously biases the estimates of rural poverty and has serious implications for policymaking. It is illogical to assume that similar

⁵ Ali, Mubarak, and Derek Byerlee. 2002. Productivity Growth and Resource Degradation in Pakistan's Punjab: A Decomposition Analysis. *Economic Development and Cultural Change* 50 (4).

policy initiatives would be equally applicable to all the regions of the country. In fact, what might be a favorable policy in one area may have quite the opposite effect in another. Unless policy is informed by indigenous realities, poverty alleviation will be neither effective nor efficient.

The recent literature indicates a growing recognition of the dynamic nature of poverty. Numerous studies have highlighted the differences between chronic and transitory poverty at the international level.⁶ In the context of Pakistan, however, only a few studies have explored this concept.⁷ The lack of research in these areas in the Pakistani context is mainly due to the absence of more recent panel data.

⁶ See Yaqub, Shahin. 2000. Poverty Dynamics in Developing Countries. *Development Bibliography-16*. Institute of Development Studies (IDS), Sussex; Rodgers, Joan R., and John L. Rodgers. 1991. The Measurement of Chronic and Transitory Poverty; with Application to the United States. Working Paper No. 55. University of North Carolina at Greensboro, North Carolina; Goebel, Jan. 2001. Decomposing Permanent and Transitory Poverty. Discussion Paper No. 256. German Institute for Economic Research, Berlin; Haddad, Lawrence, and Akhter U. Ahmed. 2002. Avoiding Chronic and Transitory Poverty: Evidence from Egypt, 1997-99. Food Consumption and Nutrition Division Discussion Paper No. 133. IFPRI, Washington, DC.

⁷ See Baulch, Bob, and Neil McCulloch. 1998. Being Poor and Becoming Poor: Poverty Status and Poverty Transitions in Rural Pakistan. Institute of Development Studies (IDS) Working Paper No. 79. IDS, Sussex. Available <http://www.ids.ac.uk/ids/pvty/pvprp.html>; McCulloch, Neil, and Bob Baulch. 1999. Distinguishing the Chronically from the Transitorily Poor: Evidence from Pakistan. IDS Working Paper No. 97. IDS, Sussex. Available <http://www.ids.ac.uk/ids/pvty/pvprp.html>; Baulch, Bob, and Neil McCulloch. 2000. Simulating the Impact of Policy Upon Chronic and Transitory Poverty in Rural Pakistan. *Journal of Development Studies* 36 (6); Kurosaki, Takashi. 2003. Measurement of Chronic and Transient Poverty: Theory and Application to Pakistan. Discussion Paper Series A, No. 436. Institute of Economic Research at Hitotsubashi University, Tokyo; Villanger, Espen. 2003. *The Effects of Disasters on Income Mobility in Rural Pakistan: Bootstrap Inference and Measurement Error Simulations*. Bergen: Norwegian School of Economics.

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