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Employment Multipliers from Agricultural Growth and Poverty Reduction

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Poverty is still a major problem in Pakistan. Worse, the excellent progress made in poverty reduction in the 1970s and 1980s has been reversed in the 1990s. That is the bad news. The good news is that Pakistan is unusually well placed to return to rapid reduction in poverty.

We have long known that agricultural growth is closely related to poverty reduction. Recent studies by Peter Timmer and by Martin Ravallion and their colleagues provide massive statistical evidence of this relationship. Rural growth and agricultural growth have a major effect on poverty reduction; urban growth and manufacturing growth do not. At first glance that is strange because farmers are not the poorest rural people, and the direct benefits from agricultural growth are distributed roughly proportionately to size of landholding.

The poor in rural areas are heavily concentrated in the rural non-farm sector. They produce non-tradable goods and services. That is, local demand is essential to their growth. It is rising agricultural incomes that provide that growth in local demand. Thus, agriculture's massive impact on poverty is indirect, working through expenditures on the rural non-farm sector. The bulk of those expenditures are for consumption goods.

Pakistan has unusually productive resources that are highly responsive to the favourable forces of globalisation and technological change. In the 1970s and 1980s the agriculture of Pakistan grew at better than four percent per year, sufficient to reduce poverty levels rapidly. To return to those growth rates requires several public actions.

Institutional reform in the irrigation system needs to reverse the losses that have occurred from poor management. There must be increased expenditure on the agricultural research and extension systems and that expenditure must be subject to a few priorities and increased efficiency. The rural road and education systems need to be massively expanded. Much more emphasis needs to be placed on expansion of the high value horticultural sector for which Pakistan has a strong comparative advantage in international markets.

Those actions can be expected to bring a return to high growth rates in the four to six percent range and a resumption of rapid decline in poverty and its virtual elimination in a ten to twenty year period.

INTRODUCTION

Poverty is still a major problem in Pakistan. The World Bank's income standard for defining a poverty baseline is $1 per day of purchasing power parity income on a 1993 base. By that standard, as reported in *World Development Indicators for 2001*, 31 percent of Pakistan's population fell under the poverty line in 1996.

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Malik (1991) reports a decline in absolute poverty in rural Pakistan of nearly 50 percent from 44 percent in 1969-70 to 24 percent in 1984-85. Malik's poverty line is somewhat higher than that of the World Bank. Nevertheless, it would appear that poverty reduction has slowed or reversed since the mid-1980s. The period 1967–70 to 1984-85 was one of much faster agricultural growth than at present. That would explain a setback in poverty reduction in the more recent period.

Of course, poverty is a multi-faceted phenomenon. Educational attainment, health status, food security, women's participation, empowerment of the poor, and many other factors describe the reality of poverty. However, income is a central factor, both driving and complementing most of the other characteristics of poverty. For that reason, the OECD/DAC sets income poverty at the centre of the poverty reduction stage. The target of reducing the proportion of the population under the income poverty line by one-half by 2015 is the most cited of the OECD/DAC targets. In an earlier period, Pakistan approximately met the rate of poverty decline implicit in that target.

The World Bank, in its country strategies, tends to use an average response of poverty reduction to GDP growth to define its basic strategy for poverty reduction. Since that average response is large, policies that most efficiently accelerate GDP growth are seen as the central means of reducing poverty. The policy emphasis is on prescribing macro policy based adjustments in the economy. In practice, those policies have been a mixed bag for both growth and poverty reduction, as stated in detail later in this paper.

The elasticity of poverty reduction with respect to GDP growth applied by the World Bank is 2.12 [Bruno, Ravallion, and Squire (1998)]. That is, for each one percent increase in GDP growth rate, the proportion of the population falling under the poverty line is reduced by 2.12 percent. With that measure, in general, it takes a six to eight percent growth rate to achieve the OECD/DAC targets for income poverty reduction.

However, the variance around the average elasticity of poverty reduction with respect to GDP growth is very large. In fact, GDP growth only explains 37 percent of poverty reduction, with a massive 63 percent left to be explained by other factors [Ravallion and Chen (1989)]. Recent analyses of large intertemporal and interregional data sets show that the structure of the growth is a major factor in explaining the bulk of poverty reduction. The structure of growth does indeed matter very much. Another factor of importance is the initial condition of income distribution, and particularly of land distribution. When that distribution is highly unequal, not only is growth slower than with more equal distributions, but the efficiency of growth in reducing poverty is greatly reduced as well.

This paper is therefore concerned with the structural influences on growth, and particularly the role of the agricultural sector in those processes. The paper accepts that employment and poverty are two sides of the same coin. The poor have

little capital or land, depending primarily on labour for their income. Thus, the critical factor in reducing income poverty is increased employment. Employment growth is important in increasing the amount of employment per member of the labour force. As labour markets tighten rising real wages provide further increase in incomes of the poor. Poverty declines rapidly when employment growth is sufficiently rapid as to raise real wages. That gives a double benefit to the poor.

As will be shown in the main text, it is agricultural growth that provides the rapidly increasing employment that is essential to rapid decline in poverty levels. However, it does so through complex processes the indirect effects of which are greater than the direct effects. The complexity of these processes has served to distract attention from the importance of agriculture in poverty reduction. High agricultural growth rates require priority to public policy and public investment, both of which tend to be under-emphasised in structural adjustment programmes.

The good news in Pakistan is that it has excellent agricultural resources that are potentially highly responsive both to modern technological advance and to the forces of globalisation and trade. The bad news is that agricultural growth has been slow in the past decade or so. The critical elements in a high agricultural growth rate for Pakistan are irrigation efficiency, technological improvement based on research and extension, public investment in rural roads, other elements of physical infrastructure and education, and shift to higher value crops encouraged by the opening of global markets. The progress on each of these has been sub-optimal over the last decade. But, the institutional basis is there for major improvements in each.

THE GENERAL RELATION BETWEEN GROWTH AND POVERTY REDUCTION

The traditional interpretation of basic data led to the conclusion that in the early stages of economic growth, inequality tended to at first increase and only in later stages of growth did it decrease. This pattern is often called a J curve, for its distinctive shape, or the Kuznets curve, for the data generated by Simon Kuznets that was thought to document this relationship [Kuznets (1955)].

Most of the analysis that led to this conclusion was based on historical data for the currently high-income countries. A range of literature from 1971 to 1995, covering developing countries, seemed to support the Kuznets hypothesis about worsening of income distribution in early stages of growth. More recent literature, based on more sophisticated data analysis finds contrary results.

Bruno, Ravallion and Squire (1998) reviewed 63 surveys for 44 countries spanning 1981–92 and found no support for the worsening of income distribution with growth. They further reviewed data from 45 countries for which time series data were available and found the bulk of variation in income distribution accounted for by differences among countries and only 7 percent accounted for by variation

over time within countries. From these data, they conclude that the distribution of income is quite stable over time within countries.

A large number of other studies confirm that growth does not worsen income distribution, and therefore does decrease absolute poverty and the proportion of the population in poverty. [Fields (1989); World Bank (1990); Squire (1993); Lipton and Ravallion (1995); Ravallion (1995)].

Even before the current plethora of data on poverty reduction, time series for Taiwan showed that its pattern of growth provided decreased inequality right from the start [Lee (1971)]. For example from 1970 to 1985, the Gini coefficient fell from 0.321 to 0.277 [Thorbecke and Wan (1999)]. Now that the relation of agricultural growth to poverty reduction is better understood and documented, the Taiwan case is particularly important for lessons about the processes of agricultural growth that rapidly reduce poverty.

India has the best, and perhaps only, long-term series of comparable data on income distribution in a large developing country encompassing considerable geographic variation in the various poverty related variables. These data give "no sign that higher growth rates in India put upward pressure on overall inequality" [Bruno, Ravallion, and Squire (1998)].

Timmer shows, based on sophisticated analysis of the Deininger and Squire data (1996) that "each one percent increase in per capita income for the overall population is matched by a one percent increase in income of the bottom forty percent in the income distribution" [Timmer (1997)]. That is, growth is neutral to the distribution of income. All income classes participate equally.

All the preceding studies calculate relations between growth and more complex definitions of poverty, in addition to the headcount measure cited above. In every case, the impacts are roughly the same or somewhat more favourable for the very poorest.

If the distribution of income does not change with growth, then a simple calculation shows to what extent population is lifted above any given absolute income line. It is on this basis that the World Bank estimates the effect of growth on poverty reduction.

Analysis of 20 countries shows an elasticity of poverty reduction with respect to income increase of –2.12 [Bruno, Ravallion and Squire (1998)]. Ravallion and colleagues estimated the elasticity of poverty reduction (proportion of the population below the poverty line) with respect to income for India at –2.2 [Datt and Ravallion (1998)] and for Indonesia as –2.1 [Ravallion and Huppi (1989)]. A figure of –2 means that starting with 40 percent of the population below the poverty line and a one-percent rate of increase in the per capita income; the poverty ratio would drop to 39.2 percent in the first year. It would drop to 36 percent in the first year with a five-percent growth rate in per capita income. With that high growth rate, the poverty ratio would drop in half in seven years. Thus, on average, such a high growth rate easily meets the OECD/DAC poverty targets.

Reliance on this average relationship is misleading in three respects. First, it ignores the large variation around the mean and the implication that other factors may be important to poverty reduction, including the structure of growth. Second, the high growth rate countries generally have a favourable structure of growth. In particular, it is difficult for low and middle-income countries to achieve high growth rates without rapid growth in agriculture. Thus, the poverty reduction attributed to growth may well be due to a particular structure of growth. Third, focus on the overall growth rate removes attention from the critical public policies and investments required by those elements of the structure that are most important to poverty reduction.

As stated above, using the absolute poverty measure of $1 per day of income, growth only explains 37 percent of the change in poverty [Ravallion and Chen (1997)]. That leaves 63 percent to be explained by other factors. What those factors are is the subject of the next section.

THE STRUCTURE OF GROWTH AND POVERTY

It is clear from the preceding review that there is large variation among countries and over time in the relation between growth and poverty reduction. That variation is largely due to variation in the rate of growth in the agricultural sector. However, the agricultural impact on poverty reduction is seen in its effect in increasing the demand for labour-intensive non-farm goods and services produced in rural and market town areas in small-scale enterprises. These goods are of low quality, with high transaction costs in international trade. Their market is thus dependent on domestic sources, primarily agriculture. They are, in the trade vernacular, non-tradable commodities.

POVERTY AND AGRICULTURAL GROWTH

Two recent studies provide detailed data on the relation between the structure of growth and poverty reduction. They confirm similar results from earlier, but much less comprehensive data. The two recent studies are by Ravallion and Datt (1996) for India, and Timmer (1997) for a cross-section of a large number of countries. Several studies of other countries confirm the broad relationships.

The two studies differ in methodology and in source of data, but find the same striking relationships. The Ravallion and Datt paper has the advantageous of drawing from a single basic source without the weakness of cutting across very different countries. However, the Indian experience, like that of any one country, has specifics of its own. Thus, it is important that findings from the India data are confirmed by the cross-national study from Timmer, by the individual studies for other countries, and by theory. Each will be discussed below. In sum they make a convincing story.

Preceding the studies of Timmer and Ravallion, Ahluwalia (1978) presented data showing that increased agricultural output per head of the rural population decreased poverty. Dharm Narain furthered this analysis with important conceptual additions [reported in Mellor and Desai (1985)]. Mellor and Desai (1985) elaborate at length on the relations described by Narain, the supporting data, and alternative interpretations of the data.

For both Ahluwalia and Narain, the data cover a period when both agricultural growth and poverty fluctuated considerably, without any sustained agricultural growth or poverty reduction. Thus, their analyses essentially deal with a situation not of steady growth but of fluctuations in income. In practice, those fluctuations were substantially driven by the varying effect of weather on agricultural production.

The Ravallion and Datt (1996) work for India is recent enough to include periods with far higher agricultural growth rates than those depicted in the earlier studies as well as sustained growth beyond previous peaks and declines in poverty far beyond previous troughs.

Ravallion and Datt relate change in yields of crops to poverty. They show that reduction in poverty is a result of growth within sectors, not the transfer of labour from a low earning sector to a high earning sector. The latter is the basis for the Kuznets J curve. But what is truly striking is that agricultural growth and tertiary sector growth have a major effect on poverty reduction and manufacturing growth does not. Further the service sector growth that has the favourable effect is the small-scale portion of that sector, which we will show later is itself closely related to agricultural growth.

The Ravallion and Datt data show that 84.5 percent of the substantial poverty reduction in India in the period of analysis was due to agricultural growth. That is truly startling data. They also show little effect on poverty of the many programmes that directly target the poor.

Growth of manufacturing in India has historically been biased towards large scale capital intensive industry, so the manufacturing data may be somewhat biased as compared to a market oriented structure [Mellor (1976)]. But, the Timmer (1997) data confirm the Ravallion Datt findings for a large cross section of countries.

The various studies show that industrial growth does reduce poverty from the direct effect of income increase, but it concurrently has an unfavourable effect on the distribution of income thereby reducing the effect on the poor. Agricultural growth, including its indirect as well as direct effects, does not have the unfavourable distributional effect.

Ravallion and Datt show that wage rates are important to poverty reduction and that higher farm productivity is closely associated with higher wage rates. Similarly, food prices are important and higher farm productivity reduces food prices. Thus, it is farm production that drives poverty reduction. In a later section, we will elaborate on this relation of agricultural growth to non-farm employment and hence to wage rates.

Timmer (1997) uses the Deininger-Squire data set for poverty and purchasing power for 35 developing countries and relates those data to agricultural GDP per capita. "A one percent growth in agricultural GDP per capita leads to a 1.6 percent increase in per capita incomes of the bottom quintile of the population". (p. 3). Unlike Ravallion and Datt, Timmer shows a positive elasticity for industrial GDP. Nevertheless, the agriculture elasticity is 38 percent larger than the industrial elasticity.

The 27 countries and 181 observations (studies) from 1962 to 1992 in the Timmer sample of the Deininger-Squire data include 3.3 billion people in 1995 or two thirds of the population of low and middle income countries as classified by the World Bank [Timmer (1997)]. On average, agriculture accounted for 25 percent of GDP and 51 percent of the labour force. Countries are roughly equally divided among regions of the world, with some under representation of Africa.

Datt and Ravallion (1998) do not find a declining trend in the elasticity of employment with respect to agricultural output. The power of the relationship holds up over time. Thus, the current decline in the rate of poverty reduction is due to decline in the agricultural growth rate, not due to declining power of that variable.

Gini coefficients for sub-sectors of the economy tend to be unstable. However, the following data from Sharma and Poleman (1993) corroborate other evidence on the high degree of equality in specific agriculture related sub-sectors. Pakistan would likely show similar coefficients, with similar implications for poverty decline. Sharma and Poleman show that increments to crop income alone skew the distribution towards the well to do, with a Gini coefficient of 0.86, far above the national Gini coefficient. That finding is of course consistent with early critics of the Green Revolution. See also Adams (1999) on this point.

In sharp contrast to crop income, the Gini coefficient for dairy production, which is very important to the poor in India because of its labour intensity, is 0.11. That is an extraordinarily low Gini coefficient, but is quite consistent with the observation that dairy animal numbers vary little by size of farm, while dairy marketing's are inversely related to farm size. This is all consistent with the well-known favourable impact of increased dairy production on the poor. The Gini coefficient for off-farm work in rural areas is a still low 0.22. That also reinforces the data that show off-farm income of the rural poor is an important source of poverty reduction [Adams (1999)]. Thus, when rising agricultural incomes are spent in those sectors, they redistribute income towards the poor.

The data show clearly that it is growth of agriculture that reduces poverty, not growth in general. One misleading interpretation should be avoided. Typically high overall growth rates are achieved when agriculture grows rapidly. That is because the resources used for agricultural growth are only marginally competitive with other sectors. Therefore, fast agricultural growth tends to be additive to growth in other

sectors, as well as being a stimulant of growth in the labour surplus non-tradable sector [Mellor (1976)].

The countries that grew the fastest from 1985 to 1995 experienced a narrowing of the income gap [Timmer (1997)]. That means that agricultural growth resulted in faster overall growth and an improvement in the income distribution. Thus, emphasising agriculture in order to improve income distribution does not result in slow growth. The sectors are more complementary than competitive. Conversely, leaving out the forces that accelerate agricultural growth, as has been increasingly the case in the past decade, provides slower growth and leaves out the poor.

The average elasticities cited at the beginning of this section are strongly influenced by high agricultural growth rates. Thus, it is grossly misleading to think of those elasticities as applying to some average growth rate. Those are predominantly the elasticities when agriculture grows rapidly. However, in the 1990s, prior to the economic setback in East and Southeast Asia, overall growth rates were high, but agricultural growth rates had slowed, and hence the pace of poverty reduction declined. It follows that in that period and those circumstances, the elasticity of poverty reduction with respect to GDP growth declined.

Thus, agricultural productivity increase has a major effect in reducing poverty, and the effect is relatively greater in its impact on the poorest and the distribution of income among the poor. Industrial growth has much less or even no effect in reducing poverty [Ravallion and Datt (1996) and Timmer (1997)]. Service sector growth has no effect for the large-scale part and a substantial positive effect for the small-scale portion.

If growth occurs leaving the agricultural sector out, two onerous burdens fall on the poor. First, the overall growth rate will be lower. Second, the component of growth that reduces poverty will be missing. As we will show later, rapid agricultural growth is more easily achieved now than some decades ago, but it does require overt actions by government.

AGRICULTURE-LED NON-FARM GROWTH

The circumstantial evidence is strong that agriculture's powerful poverty reducing effect comes substantially through its impact on the rural, non-farm, small-scale sector. There is considerable knowledge of this sector from the studies of Liedholm and his colleagues [e.g. Liedholm and Meade (1987)]. They conclude that this sector is large, employment intensive, expands readily in response to increase demand, and is largely driven by farmer demand.

Nevertheless, the evidence about the size of the sector, the proportion of incremental farm income spent in this sector, and the employment intensity is meager. The evidence of its links to agriculture and its importance to employment

calls for intensive study. The following paragraphs summarise the current state of knowledge of this sector. The analysis commences with my early work on agricultures GDP multipliers and the subsequent work of Hazell and Delgado. The innovation in my more recent work is to carry that analysis a step further to analyse employment multipliers as a means of directly examining impact on poverty.

Because the agricultural sector in low-income countries is so large, accelerated growth into the four- to six-percent range adds immense purchasing power [Mellor (1995)]. That is because this growth is substantially driven by improved technology (e.g. yield increasing crops of the Green Revolution) and mobilises previously under-utilised farm family labour resources within agriculture. Agricultural growth is productivity enhancing.

Several empirical studies cited above document that farmers spend a substantial proportion of incremental income on locally produced non-farm goods and services. Liedholm and Meade turn that around and state that the rural non-farm sector derives a high proportion of its demand from agriculture. Since this is a large employment intensive sector it is logical to turn to these forces to explain the powerful effect of agriculture in increasing employment and reducing poverty.

This argument is also consistent with the lag in the effect of agricultural growth; the fact that highly skewed distribution of income from land removes the poverty reducing effect, and the important wage increasing effect of agricultural growth. Further, the power of this income effect causes a tightening of the labour market that cannot be explained by the agricultural growth alone. Because it is the income growth that drives the process it does not matter that the initial income effect is concentrated in the hands of the middle peasant rather than the poor. The poor benefit in the next round. They benefit massively, not marginally.

It is notable that rapid agricultural growth is based on forces that increase factor productivity. That is particularly true of land productivity, but labour productivity also increases. Thus, even when labour is very low cost, the elasticity of employment with respect to output is no greater than 0.6, and as labour markets tighten that elasticity drops to 0.3. Agriculture's large impact on poverty reduction is not due to its labour intensity of output increments.

Three questions arise about stimulation of the rural non-farm sector. How large is the sector that is driven by agricultural incomes and is it a tradable or non-tradable sector? How employment intensive is this sector? And, to what extent is it driven by purchase of production goods and to what extent by consumption goods? These questions are difficult to answer. Although the questions are important, National income Accounts are not categorised appropriately to answer them.

THE SIZE OF THE AGRICULTURE-DRIVEN SECTOR

There are two ways to get at the issue of the size of the agriculture driven non-farm sector. One is by surveys of the production pattern and source of demand

for output for the sector thought to serve agriculture. The other is through analysis of the consumption patterns for incremental income of farmers. Neither type of information is well developed. Farmer expenditure data rarely give sufficient breakdown to allow analysis of impact on the rural non-far, non-tradable sector. Surveys of small business in rural and market town areas are infrequent and usually lacking in the necessary detail with respect to sources of demand.

Delgado spells out in some detail why it is the non-tradable sector that is important to the employment increasing poverty-reducing impact of agricultural growth [Delgado, *et al.* (1998)]. The non-tradable (goods and services that do not enter international trade) sector cannot by stimulated to growth by international exports. The labour force and production systems are such that they are not employable in the short run producing goods and services for other than the rural market.

Of course, in the long run, with education and gradual integration of markets, labour will move into tradable sectors. The story of low incomes is the slow pace at which that transformation occurs. In the meantime, rapid growth in demand for such output provides employment, expands the number of entrepreneurs, and creates a favourable environment for the transition to tradables. The interaction between agriculture and this large sector is an important part of the transition to a modern economy.

Peasant farmers spend a high proportion of incremental income on low quality goods and on non-exportable goods and services. Examples are expanded housing, personal services, increased lower level education, increased health services, and local transport. Note that where labour is cheap, prospering farmers hire a substantial addition of labour so as to shift family labour away from farm production to education, leisure, and marketing activities [Hayami and Kikuchi (1999)]. This too, is an important source of incremental employment amongst the poor of low-income countries. These are all non-tradable and are produced primarily by labour with very little capital.

Consumption studies suggest that in middle-income countries, e.g. Egypt, this sector, located in market towns and rural areas has an initial GDP roughly equal to that of agriculture [Mellor (1999)]. It is striking that even at this stage of development the sector is large and non-tradable. In Africa, with very low incomes, it may be only one fifth the size of agriculture [Delgado, *et al.* (1998)].

In very low income societies, with minimal commercial differentiation, as in most of Africa, the multipliers from agriculture growth to the non-farm sector are much weaker than in more differentiated societies. However, Delgado, in a careful analysis for sub-Saharan Africa, points out that marginal propensity to consume non-tradable agricultural commodities is very high. Thus, farm incomes may also drive demand for important farm commodities.

In middle-income countries, the agriculture driven non-farm sector may be as large as agriculture [Mellor (1999)]. The incremental income in farmer's hands will be spent more than proportionately in that sector. That is, the income elasticity of demand for the products of the rural non-farm sector is typically on the order of 1.5.

EMPLOYMENT IN THE AGRICULTURE-DRIVEN SECTOR

Employment elasticities in the agriculture driven non-farm sectors are high, close to one. Increasing demand drives increased output. As long as real wages are constant, there is no incentive to increase labour efficiency. Since very little capital or land is employed in this sector, virtually all the gross income is return to labour.

Empirically, compared to farming, if GDP in the sector is equal to that of agriculture [Mellor and Gavian (1999)], but twice the labour intensity, the initial labour force is twice that of agriculture. Typically in low-income countries, about half of base income is spent on production services and locally produced consumption goods [Bell, *et al.* (1980); Hazel and Roell (1983)]. With a multiplier of two that would account for the rural non-farm sector being equal in size of GDP to agriculture.

With an average income elasticity of demand for rural non-farm commodities of 1.5, and an elasticity of employment of 0.9, employment expands at 1.35 percent of the base year for each percent increase in the rate of growth of agricultural income. With a 5 percent growth rate in agriculture, 2.5 percent population growth, the rural non-farm sector expands at a rate of 6.25 percent. Employment expands at 5.6 percent. The additions to employment in the agriculture-stimulated local non-farm sector is 58 percent greater than that in agriculture.[1] That is the key point about the agricultural growth impact on poverty.

AGRIBUSINESS AND CONSUMPTION GOODS

Fertiliser and other chemical and mechanical inputs to agriculture are in the tradable sector and tend to be imported or produced by capital-intensive processes. Increased demand for such goods does not add much to employment and that demand could have been provided from exports.

In contrast, the local marketing services for these inputs and for output are both labour intensive and largely non-tradable. Thus, the increase in demand from agriculture stimulates production and employment that are net additions to the economy that could not come from other sources. That will remain true as long as there is poverty representing inadequate employment opportunity for the wage earning classes.

[1]With an elasticity of employment with respect to growth of 0.6 in agriculture and 0.9 in the rural non-farm sector, 5.0-2.5(1.5)+2.5=6.25. (5.0) 0.6=3.0. (6.25)0.9=5.6. 5.6÷3.0= 1.9. 3.0 is 58 percent larger than 1.9.

Studies of marketing margins suggest that the stimulus to the rural and market town non-tradable sector is equal to about 10 percent of the value of incremental agricultural production since a high proportion of incremental production depends on purchased inputs and is marketed.

Consumption studies in Asia show about 40 percent of incremental income are spent on locally produced non-farm goods and service [Hazell, *et al.* (1983)]. These are all highly labour intensive in their production.

Thus, consumption goods comprise about three-quarters of incremental demand for rural, non-farm non-tradables and production services about one-quarter. It is the consumption expenditure that is dominant [Mellor and Lele (1973)].

RICH PEASANTS AND INCOME DISTRIBUTION

A substantial literature in the immediate post Green Revolution period stated that the Green Revolution concentrated incremental income in the hands of the land owning classes, including the middle peasant or kulak, to use the Marxian term. Consequently, it was believed, the poor did not participate in farm income growth. The concentration of income led to further concentration of land ownership. That was the basis for much of the anti-Green Revolution spirit of the 1970s.

This exposition points out that in fact increased agricultural incomes in the hands of the middle peasant or kulak has powerful employment linkages, but they take time to operationalise. The initial studies did not allow for that time and in any case were only concerned with the direct affect of income growth.

The important point is that an initial skewing of the benefits of agricultural growth towards the higher income rural people is not antithetical to poverty reduction. The issue is not the initial distribution of the increased income, but the expenditure patterns from that income. Middle peasants in low-income countries spend a high proportion locally on non-tradables, thereby providing a stimulus to production and particularly to employment, that cannot be obtained in any other manner.

Delgado, *et al.* (1998) carefully documents that in Africa. Incomes and commercial differentiation are so low that the non-farm goods and services receive relatively little stimulus. However, the increment to demand for agricultural non-tradables is very large, stimulating a large increase in demand driven production of high value agricultural products (livestock and fruits and vegetables), and even for some non-tradable basic staples. Thus, an initial stimulus to agricultural growth from technological change (high-yielding varieties of basic staples) has strong multipliers back to other sectors of agriculture that are highly labour intensive. The effects are precisely as described for the rural and market town non-farm sectors.

THE RURAL AND MARKET TOWN NON-FARM SECTOR

The rural and market town non-farm sector is inadequately studied, with no systematic data on the sources of effective demand for the sector's output. We do

know that the sector typically represents over half of all non-farm employment [Liedholm and Meade (1987)]. The sector is largely located in rural and small town areas, the effective demand comes largely from local sources, particularly including agriculture, and the sector expands readily in response to increased demand [Liedholm and Meade (1987)].

The sector represents a far higher share of employment than of GDP, even more so than agriculture. That is because it uses very little capital per worker, uses relatively unskilled labour, and pays low wages. Agriculture uses substantial land per worker with a substantial return to that land. Tradable industry uses far more capital per worker and tends to use more skilled labour.

The small-scale sector is the path out of poverty for the poor who possess little education and are either underemployed or use a substantial proportion of their time in job search. Experience in the small-scale sector then prepares them for movement up to higher paying jobs in the tradable sectors. Thus, the sector is not only large, but is an important zone of transition as well. Development is a step by step process and we see in country after country that steps in the process cannot be skipped without deleterious impact on the poor.

The growing importance given to micro enterprise and micro credit in foreign assistance programmes reflects a growing recognition of that importance. What is not yet generally recognised is that without growth in farm incomes, the demand for this sector's output does not rise and efforts to increase access of some to the sector is at the expense of others already in the sector. Agricultural growth is absolutely essential to this sector playing its important role in lifting the poor out of poverty [Mellor (1995)].

Analysis of farmer expenditure patterns shows that in middle income countries, 40 percent of incremental income is spent on locally produced non-farm goods and services [Hazell and Roell (1983); Bell and Hazell (1980); Haggblade, *et al.* (1989)]. In lower income countries, the percent is much lower because of much higher expenditure on food and lesser differentiation of the economy. The multipliers of agricultural growth on non-agricultural growth in the references just cited are corroborated in macro studies such as Rangarajan (1982) for India.

However, Delgado (1998) shows that in such situations, much of farm production is non-tradable—livestock and fruits and vegetables are non-tradable on quality and transport grounds and even much of the grain sector is non-tradable (low quality, high transport costs). In such economies, the demand of farmers for these products is elastic. Thus, in both very low income undifferentiated economies and in more advanced middle income countries the bulk of employment growth is in sectors that depend on increments to local demand derived from agriculture for expansion of demand, production and hence of employment.

A simple rhetorical question makes the point about this large, employment intensive sector. Where else will these goods and services be demanded; and, what

else can this massive number of people produce in the short run? Hossain (1988) shows that if agricultural incomes are not rising, credit for small-scale firms simply expands the ones receiving credit at the expense of those already existing firms not receiving the additional credit. The expansion without effective demand reduces prices and returns to labour. The process spreads the misery.

DATA FROM EGYPT AND RWANDA, WITH IMPLICATIONS FOR PAKISTAN

Egypt has considerable relevance to Pakistan. Although Egypt has nearly twice the purchasing power parity per capita income of Pakistan, the share of agriculture in the economy is similar (Pakistan 27 percent and Egypt 17 percent in 1999, [World Bank (2001)]. The agriculture of both countries is based largely on large irrigated areas.

Table 1 presents data on shares of incremental employment and GDP in a high growth rate scenario for Egypt. These data serve as a rough indicator of what those relationships might look like for Pakistan. As a sharp contrast, data for Rwanda are also presented as an example of a very low-income country.

As stated before, national income accounts are not kept in a manner that allows segregating the rural non-farm sector, even though it is the most important sector from the point of view of employment growth and poverty reduction. As a result of deficiencies in data classification, considerable detective work was required to generate the numbers in Table 1. As much as possible, the numbers in Table 1 are based on the national income accounts, but that source must be leavened by rural survey data and specific studies of the sub-sectors that are delineated.

Table 1

Egypt and Rwanda, Shares of GDP and Employment Growth, High Growth Future

	Egypt		Rwanda	
Sector	Share of GDP Growth, %	Share of Employment Growth, %	Share of GDP Growth, %	Share of Employment Growth, %
Agriculture	7	18	33	26
Rural Non-farm	9	48	26	60
(Sub-total)	(16)	(66)	(59)	(86)
Urban	84	34	41	14
Total	100	100	100	100

Source: Mellor and Gavian (1999) and Mellor (2001).

In a high growth scenario for Egypt, agriculture and the agriculture driven non-farm sector account for 66 percent of employment growth and only 16 percent of GDP growth [Mellor and Gavian (1999)]. GDP growth is largely from the tradable sector, employment growth largely from non-tradables. The tradable sector provides much of the effective demand for expansion of agriculture, particularly the high employment livestock and horticultural sectors. Agriculture and its stimulus to the non-tradable sector provides the bulk of employment growth.

A very low-income economy, such as Rwanda, is much more dominated by agriculture than a country like Egypt. Agriculture accounts for more than 3½ times as high a proportion of GDP growth, compared to Egypt. Agriculture and the rural non-farm sector driven by agriculture account for essentially all of employment growth (86 percent).

Pakistan, as stated, would be much more like Egypt than Rwanda. A somewhat higher proportion of both GDP growth and employment growth would be agriculture-related. That means that close to three-quarters of employment growth would be attributable to the direct and indirect effects of agricultural growth. Similarly the indirect effects of agricultural growth on employment would be on the order of 2½ times as large as the direct effects within agriculture itself.

Thus, employment growth and poverty reduction in Pakistan will be dominated by what happens in agriculture. If agriculture grows as rapidly as in the best periods of the past, poverty will come down rapidly.

In interpreting these numbers for Pakistan two important caveats are in order. First, given the significant portion of Pakistan's agriculture taking place in the Sindh, with its very large landholdings and somewhat feudal conditions, the employment multipliers will be reduced significantly. Second, at some point, and more likely sooner than later, Pakistan's unusually poor record in education will slow employment growth.

The education requirements for the rural non-farm sector are lower than for large-scale urban industry, and there is substantial scope to absorb illiterate workers in the farm production sector. Nevertheless, the higher paying jobs in the rural non-farm sector do increasingly demand educated people. Failure to provide those people will slow the expansion of the sector and shift expenditure towards less labour-intensive enterprises. Slow progress in education will be an increasingly serious problem for Pakistan. Given the importance of population growth rate to poverty reduction, as pointed out in the next section of this paper, the unusually poor record on women's education is an immediate drag on poverty reduction.

Thus, for pro-poor growth the old concept of balanced growth needs to be resurrected. Yes, open up the economy, play to comparative advantage, follow-up pro-growth macro policy and let the private sector loose. But, at the same time take the public sector actions needed to move the agricultural sector to provide effective demand for the labour-intensive, non-tradable sector.

IMPLICATIONS FOR PAKISTAN

The thrust of the preceding analysis is that Pakistan requires a high growth rate in agriculture, well above the population growth rate, if poverty is to be reduced. It is the rate of growth of agricultural output per capita that gives the boost to demand growth for the rural non-farm sector. Because Pakistan has a high population growth rate (2.6 percent in 1980–99) the required agricultural growth rate is higher than for a more normal rate of population growth. That is, to achieve a two-percent per capita rate of growth of agricultural growth requires a 4.6 percent rate of agricultural growth. Whereas India, with a 1.3 percent rate of population growth in the same time period, only requires a 3.3 percent rate of agricultural growth to get the same 2.0 percent per capita.

In agriculture the difference between 3.3 percent and 4.6 is significant. Fortunately, Pakistan has unusually productive agricultural resources that can respond well to modern technology and to globalisation.

Government of Pakistan data shows a constant 4.1 percent rate of growth of agricultural output from 1975 to 1991. During much of that period poverty rates declined rapidly. That was particularly the case in the Punjab where the growth was very rapid and the distribution of land and of agricultural income relatively equal. However, data for 1991–97 show a slowing of the agricultural growth rate to 3.7 percent (or a little over one percent per capita). Presumably poverty ceased to decrease or decreased very little in this more recent decade.

What are the factors that would reduce the agricultural growth rate? The most important factor is the declining efficiency of irrigation. Second, is declining effectiveness of the technology generation and application process. The third factor is not taking sufficient advantage of the forces of globalisation to increase the value of output growth by a shift in composition of output. These are of course the standard problems in accelerating agricultural growth. They will be reviewed briefly here in the context of implications to poverty reduction.

Irrigation

Pakistan has an immense irrigation resource watering highly productive soils. Numerous reports over the years have focused on the mismanagement of that resource and the declining land productivity. I have estimated elsewhere that the impact of the declining productivity of the irrigation resources has been masked by increasing productivity from technology and that the isolated effect of irrigation deterioration translates into a two percent per year loss of productivity [John Mellor Associates (1994)].

The World Bank and the Asian Development Bank, working closely with the Government of Pakistan have recommended a set of institutional reforms, pilot projects for which are underway. These seem to be the needed reforms and as they

move to full implementation they should remove the drag to growth from irrigation deterioration.

Technology

Numerous studies have shown the immense productivity of the Pakistan agriculture research system and its complement of extension [for a review of this literature so John Mellor Associates (1994)]. However, reduced funding in real terms for this complex of research and extension has slowed progress at a time when achieving results is becoming more difficult, requiring more use of basic science. In addition, the scope of agricultural research needs to be broadened to service the potentials in high value horticulture. That in turn requires attention to complex complementary relations between public sector research and private sector research, both international and national.

Shifting the Structure of Production Towards High Value Commodities

Once the easy breakthroughs in catching up to yields in more advanced countries are achieved, high growth rates are increasingly achieved by shifting the product mix towards high value commodities. It is notable that the high agricultural growth rate countries achieve rates of growth of agricultural production of four to six percent [Mellor (1995)]. That high growth rate cannot be achieved on a sustained basis only by raising yields of the basic field crops. It requires a large increase in value of output from shift to high value horticultural crops and a shift to intensive livestock production. The potential in horticulture has been greatly increased by two major phenomena of the past two decades, both of which are grouped under the rubric of globalisation.

First, technology has continued to reduce transport costs rapidly, partly by direct effects on transportation efficiency, and partly be making commodities less bulky and less perishable. Second, markets for horticultural products, although by no means fully open, have opened more than in the past. Concurrently, in much of the world, incomes are rising rapidly and tastes are shifting towards horticultural products, increasing the total size of the markets. Thus, now in Pakistan the demand for horticulture can grow much faster than domestic demand, thereby facilitating substantial increase in the agricultural growth rate.

Pakistan is well located relative to large markets in the Gulf countries. It can exploit those markets more fully by emphasis on improved efficiency in agri-business, obtaining scale economies in the region by concentrated effort, and working to reduce transport cost and information gaps. It is notable that Egypt devotes 18 percent of its crop area to horticulture and orchards. Southern California, with a similar irrigation regime and climate devotes 35 percent of its cropped area to

high value crops. The comparable figure for Pakistan is only three percent. There is ample technical scope for shift to high value crops in Pakistan.

It should be noted that Afghanistan has an important complementary relation with Pakistan in the horticultural export area. Afghanistan too has a comparative advantage in production of horticultural exports, but it will remain deficient in export infrastructure. It is logical that those exports move out through Pakistan, improving the economic ties between the two countries and providing Pakistan additional scale economies in the exports of horticultural commodities.

Inequalities of Land Ownership

The evidence is now overwhelming that highly unequal distribution of land slows growth and greatly reduces the impact on poverty reduction. Agricultural growth has been effective in reducing poverty in the Punjab. However, the inequalities of land distribution are far greater in the Sindh. Those inequalities have retarded the growth rate and reduced the impact of what growth has occurred to essentially zero for poverty reduction. The weight of the Sindh in overall agriculture and poverty in Pakistan is sufficiently great that it biases the poverty numbers upward greatly. To an outsider it is not clear what can or should be done about this, but the problem needs to be illuminated in the context of concerns about poverty. As noted above, educational status is important to poverty reduction from agricultural multipliers. The poorer participation of the poor in education in the Sindh is a further retardant to poverty reduction in the context of agricultural growth.

THE REQUISITES OF PRO-POOR GROWTH

The requisites of pro-poor growth fall in two categories.

First, vigorous pursuit of the macro policies and privatisation that will bring as vigorous export-led growth as possible. This part of structural adjustment has been good for poverty reduction.

Second, follow the essentials of rural growth. These fall in three categories. Each of these categories requires public sector actions and investment. When structural adjustment has mindlessly reduced public expenditure is has had a powerful negative effect on agricultural growth and hence on poverty reduction. The challenge is how to get the good aspects of structural adjustment without the bad.

The first category covers reduction of transaction costs and thereby facilitating specialisation and trade in agriculture. That requires all weather roads, telephones, and electricity. It should be noted that these are essentials for direct poverty reduction. Teachers and health workers normally insist on living where there are all weather roads. Even if assigned to isolated schools, they will tend to go less frequently than if they lived there.

The second category covers improved agricultural technology. Agriculture requires land and the land area is limited. Therefore, rapid agricultural growth requires yield-increasing technology and more intensive cropping patterns. In both cases, progress is positive but very slow using only indigenous methods of experimentation. They are very rapid when modern science is brought to bear. In Africa, so little has been achieved in the past few decades that application of scientific innovations of over a century ago (e.g. Mendelian genetics) can bring large improvements. Eventually, that element of science reaches diminishing returns and more recent breakthroughs will be needed. Pakistan is close to the stage of needing to use the more recent basic science breakthroughs.

The third category covers the new institutional structures needed for technology and specialisation. Marketing of basic staples has gone on for generations and the systems are well in place and effective in the private sector. However, new forms of inputs, fertiliser and pesticides are needed as farmers purchase more of those and produce a lesser proportion themselves; new forms of output, especially perishables are needed for intensification; credit needs become so large that institutions that plug into the global financial systems are needed. These are all most efficiently performed in the private sector or perhaps in farmer owned cooperatives.

However, there is a problem in starting such institutions. The private sector in developing countries tends to be trade-oriented, expecting rapid turnover. These new institutions of technology and specialisation by definition start with low volume and may not be initially attractive to the private sector. It is for government to monitor these activities to assist them as necessary and then withdraw as the volume builds.

There is an immense literature for all parts of the world on developing smallholder agriculture. See the five thousand references in the American Agricultural Economics Association review of the post war literature, divided by continental area [Martin (1992)]. With the gradual exit of foreign aid from agriculture, the current environment of foreign aid is one of large numbers of donors, pursuing objectives driven by the national politics of their home countries to acquire sufficient support for foreign aid to continue programmes.

Weak governments tend to succumb to diagnosing the needs of each donor while designing their development strategies in an effort to maximise foreign aid. The resultant patchwork of programmes is unlikely to establish the priorities essential to pro-poor growth. This represents a dilemma without an obvious solution. Once a solution is found, it proves all too often to be temporary. Meeting the donors' current poverty targets requires that for each country there be a plan, for example the PRSP, subscribed to by the government and the donors. That plan must set a few simple priorities that can be achieved. Once those priorities are met or institutionalised, then additions can be made. It is agreeing to abide by those priorities that are difficult for the collectivity of donors.

CONCLUSION

Pakistan has an unusually favourable natural resource context for rapidly reducing poverty levels. To take advantage of this opportunity requires a major emphasis on agriculture. That emphasis must address the serious institutional problems in irrigation management, the need for increase level and effectiveness of spending on agricultural research and extension and providing public sector support in business information and other means to the agri-businesses that can bring rapid increase in the importance of high value crops for export. The gross inequalities of land distribution in the Sindh need also to be recognised as barriers to both growth and even more to poverty reduction.

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Comments

1.

John Mellor has been on the scene for a considerable period of time and is both a theorist as well as a practitioner. He has been involved in countless scenarios and understands their implications well enough. However, as he himself says, poverty is many-faceted and is intractable in its solutions. The manifestations that he has given are so time-consuming and the gestation period so prolonged that one might as well give up on the effort to reduce or eliminate poverty.

The problem with the international thought process is not that they are not making any efforts at one earth creation but that they are looking for easy options or what they call doable actions. All kinds of poverty situations are put in to one category. The problem of aggregate indicators is that theses are misleading and that in countries round the world the options and solutions are different and more specific to any country. And even within these countries the solutions may differ from regions within the country.

Neither are the solutions mathematical. The evidence that a 1 percent increase in growth rate reduces poverty by 2.12 [based on elasticity] is untenable and lacks evidence. The method of eliciting these kinds of figures is to fool oneself and reduce any guilt feeling that one might have. Financial subventions do not reduce poverty. It is linked to the resource base and how well the society understands to stand by the poor and help them through a process. The nature of growth and the inner dimensions are important. If Industry growth is 147 percent in car manufacturing, it does not help the poor because the income augmentation for the poor is just not there given the current technological advancements. In fact it may be that the rich are that much more reluctant to part with their income for the poor and the effort is to buy luxury. A similar case can be made for the beverage industry where the pneumatic systems do not fare well so far as income for the poor is concerned. Suffice it to say that these mathematical permutations and combinations do not bring about the desired income augmentation or reduction in poverty that these theorists seek. The evidence is sketchy and they are to be challenged. The industry that is allowed capital intensity equivalent to the levels of the developed countries for a variety of reasons does not cater for increase in employment. Thus the Dawood textile Mills in Karachi [to give an example] had 25000 employees of various categories in 1966 and was an industry with a social face. In 1985 it had fewer than 8000 employees and although the turn over was many times that of 1966 but it was actually at a loss. Social face of the industry was nowhere visible.

Having said what I have said let me play the devils advocate and suggest that these theoretical advancements have a distinct cultural role to play. It forces planners

and others involved in policy issues to take a look at the various options. The tragedy has been that there is where the planners of a country have to come out on the side of the poor rather than on the side of the rich. Thus making the situation worse than what it was previously.

Agriculture and not industry as such is more relevant and John Mellor makes a strong plea for agricultural growth. And I agree with him. What has been Pakistan's experience? Agriculture growth rates have not been stable. Starting from 1992 to date it has touched a high of 11.7 percent and as low as –5.2 percent. The policy stability is not there. Agriculture requires factors that are not easily noticeable by a government. First it has nothing to do with the investment that is made in the sector. If it were so then the simplicity of the situation would have enabled Pakistan to be on top of the world. Whereas I agree with John that it requires Policy matters but not that investment is just as essential. Agriculture can make do with its own resources if the governments do not mess it all up. The governments are busy in working the vested interests and what the international agencies and others seek as investment are really exploitative situations created for the purpose of the vested interests. The excellent agriculture resources that John Mellor talks of are the ones that are irrigated areas of Pakistan. What of the other areas? It is my contention that the income of the other areas can be much more provided the government is sensitive to the requirements of these areas. Here the requirement is not in money but in developing a demand structure that allows for new products. But that is different argument. Suffice it to say that it might be worthwhile to look at the segment that provides to the GDP substantially but has hardly any investment. The point merits consideration because the linkage of growth with investment is not established.

John Mellor has another ability that is laudable. He in the process of discussing issues goes through the currency of the current literature. I have little to say about this except that the literature has to be studied and examined in the context of the given nuances of a country or what in local parlance may be called the Qibla of the country.

One only has to move to Cholistan, Balochistan, Thar, or the Northern Areas to realise the barrenness of the theoretical approach. There are people living there and if not looked after can be and are potential danger to the nations viability as a nation. Let me give an example. Manoor is a valley that I visited in 1954 and it was full of hope. I visited it again in 2001 and it is full of despair. There is an abundance of water and land. The people are praying for another fight with India and then there is then some hope of communications improving. Yet all that it produces are organic commodities and should theoretically provide surplus income. Marketing becomes a headache for the lack of access is real.

The other excellent point that John Mellor raises is the non-farm growth. That is a truism that is built around the fact that equity and fairness is really a matter of culture in the country. It is not. Take the case of the cotton grower and the sugar cane

growers and I do not want to belabour the point but that there is the government of the day always worrying about the powerful vested groups that want everything cheap or free so that they do not have to pay to the farmers. The cotton farmers have been getting 40 percent less than the world process ever since I remember. The sugar farmers are not paid for two to three years. How can there be any income augmentation when they are at the mercy of the informal money lender and even the ADBP shortchanges them. The reality is different and it is wise to understand this. The incremental income is just not there for the farmer to utilise elsewhere and help develop a market. If that money did come to the farmer his first option is to invest in the improvement of the land that he has.

In fact the inadequacies of data are so monumental that they force us to opine on matters of welfare and nation-building. Policy options go haywire and that seems to suit the vested groups. Consumption and living conditions indicating quality of living would lay bare the assertions we usually make on the basis of our opinions.

Punjab gives an indication of how rural markets can develop on their own. Gujranwala, Gujrat, Sialkot and Daska are some examples of rural towns gone wild on technology. There are no unskilled workers available in these areas. Names of other towns also come to mind.

The paths out of poverty are many. There are so many ways to skin a cat. There are just as many ways to get out of poverty. It is a matter of will and policy stability. The flower growers of Pattoki with assets of less than five acres are a case in point. An indicative survey would show how the existing assets were used in a manner that allowed for the genius of a people to come out. The net income when I last carried out a survey of that area is 100,000 rupees per acre. Credit and technology have been two facets of policy that the international speakers always mention perfunctorily. Credit has always been short for the Pakistani farmer. Technology has been a buzzword for far too long. What is available at 25 percent in the world is protected. What for?

Meanwhile the agriculture sector will prosper only when honesty comes to the industrial sector. The sector has been misusing its facilities to the point of being criminals. The authorities have always looked the other way. It is time to change all this.

John Mellor than fills in the paper with data on Egypt and Rwanda. Both let me say from the outset are irrelevant to us. Neither do we have the killing abilities of Rwanda nor the oil of Egypt. Egypt has a total of 6 million hectares. It does what it does with it.

The implications for the country do not follow from the data. The issues on irrigation are much more complex and will defy the policy-makers in Pakistan till we increase the application efficient of water. The ADB and WB have done this and that. The project is in tatters. The institutional; reform is not going through. The project was misconceived and did not take the provinces in to confidence. Similarly

technology matters if and only if it is affordable and it can add to productivity. The biological technologies are more relevant at the moment than hardware technologies. As for the shift to high value crops is concerned it is about time people stopped talking about it. It has been with us since the third plan. Forget it. The issues are different. All the arguments are barren if the surpluses are not there. Yes poultry can be exported to these middle east countries but how. They want a subsidy on air cargo, a production subsidy and the feed-meat ratio of the birds is 4.5:1. Try selling with that ratio. The whole issue revolves around the micro knowledge and not the macro universality. Yes, land is ownership skewed. We are going to make it more skewed because our powerful need more lands. Let the WB take cudgels. Let the ADB take cudgels. Let John Mellor say this to the policy-makers. And let us see what happens to rational thought. That is why I keep on saying that culture is important. I think that John Mellor be inducted as a farmer and given land at the hefty price of Rs 284 per acre. And he can take up to 4 squares.

My exponential experience of pro-poor growth is different from John Mellor. It will be seen whether privatisation and export led growth will lead to reduction in poverty. It is a futuristic judgment. I have given my views on this umpteen times. The surpluses are not there. Pakistan will have to worry about welfare considerations based on its own steam.

The three suggestions are difficult to implement. Transaction costs cannot be made cheaper. The inputs are getting too expensive thanks to the structural programmes. Agriculture technology has to cater for about 48 variables and is highly consilient [bits and pieces from whatever is relevant]. And these technologies are developed over time. Given the limitations of the mind these are not going to come easily. The third option pertains to new institutions. And I agree, these of course have to be consistent with our own thinking and cannot take on the hybridisation of many country's systems. The institutional arrangement cannot have pat solution for these are to be developed over time. Pakistan has been through three years of very strong and committed governance with the Finance Minister and all the worthies from the very best of international institutions. Why cannot they do the needful?

That Pakistan is an exciting country with highly variable social systems, tribal, castes, and variations of all kinds. Are these a disadvantage in developing along lines that satisfy these individual cultures? The fact is that universal solutions are not there. The solution will have to be indigenous. It can be managed. There is much that can be said for the paper and much against it. The principle is one that Jung gave us. Enantio Dromia allows for friction of opposites to go forward.

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The Pakistan Society of Development Economists deserves to be congratulated for organising the Ghulam Mohammad Memorial Lecture in honour of one of the most distinguished Agricultural Economists of the country. The society also deserves bouquet for the thoughtfulness in inviting Prof. John W. Mellor, an outstanding development economists of world fame, for delivering the lecture.

I compliment John W. Mellor for his excellent paper and equally outstanding presentation. Theme of the Memorial Lecture is very timely as poverty and its reduction have become focal points in the thinking of donor agencies as well as the policy-makers in developing countries in their efforts aimed at development. The author has rightly emphasised the role of agriculture in poverty reduction because of its pervasive and all round importance in the economies of developing countries in general and of Pakistan in particular. Quoting from Sohail Malik's findings, Mellor has reported that absolute poverty in rural Pakistan declined from 44 percent in 1969-70 to 24 percent in 1984-85. However, the poverty reduction has slowed since the mid 80s. He has observed that the period of 1969-70 to 1984-85 was one of much faster agriculture growth than the present, which should explain the setback in poverty reduction.

Mellor has rightly argued that besides the growth rate, structure of the growth is very important in poverty reduction efforts. Poverty, a multi faceted phenomenon, is affected by educational achievements, health, food security, female participation in labour, employment etc. Nevertheless, income is the key factor both in the manifestations of poverty as well as in the efforts to reduce it. In view of the domineering role of agriculture in developing countries, through its forward and backward linkages, its growth and development hold the key to the success of poverty reduction efforts. The growth in agriculture would provide demand for the goods of non farm rural sector which offers vast scope for employment of the skilled and semi skilled labour. The products and services produced in this sub sector have to find a domestic market as these goods may not be able to hold their own and compete in the export markets because of their low quality and high transport cost.

Relying on published sources, Mellor has pointed out that structure of growth is important in explaining the bulk of poverty reduction. Another factor which matters in this context is the condition of income and land distribution. John Mellor argues that employment and poverty are two sides of the same coin. Accordingly, critical factor in reducing income poverty is increasing employment. Employment growth is important in increasing the amount of employment per member of labour force. In the wake of tightening of labour markets, rise in real wages further helps in

raising the income of the poor and reducing poverty. The premise of John Mellor's paper is that agricultural growth is important for providing rapid increase in employment opportunities. However, it is a complex process, via the indirect effects which may exceed the direct effects. Complexity of the process has served to distract attention from the importance of agriculture in poverty reduction, he opines.

The critical elements in achieving high agricultural growth rate in Pakistan, identified by John Mellor, include: (i) irrigation efficiency, (ii) technological improvements based on research and extension, (iii) investment in rural roads and other infrastructure and education, and (iv) shifting to higher value crops in response to global markets.

Reviewing a large number of studies on growth and income distribution Mellor concludes that growth does not necessarily worsen income distribution. Thus, it does reduce poverty and proportion of population in poverty. He argues that pattern of growth is important in decreasing income inequalities and in this context quotes the example of Taiwan where growth and development in agriculture were helpful in reducing poverty rapidly. The large variation observed among countries and over time in the relation between growth and poverty reduction is largely due to variation in the rates of growth in agriculture. Mellor has rightly observed that the impact of agricultural growth on poverty reduction is through its effect in increasing the demand for labour intensive non-farm goods and services produced in rural and market towns. Recent studies have also confirmed that increased agricultural output per head is crucial in decreasing poverty. The Ravallion and Datt data show that 84.5 percent of the substantial poverty reduction in India during the period of analysis was attributable to agricultural growth. Their data also showed little effect on poverty of many programmes that directly target the poor. In poverty reduction efforts increases in wage rates and farm productivity are important. Higher farm productivity also helps in reducing food prices. Mellor infers from the evidence marshelled by Datt and Ravallion that current decline in rate of poverty reduction is due to decline in agricultural growth rates and not due to declining power of that variable. The countries experiencing fast growth in their agriculture have also invariably achieved high overall growth rate. Fast growth in agriculture is complementary to high overall growth rate in the economy. Mellor also quotes the examples of East and South East Asia that prior to the economic setback in the 1990s the overall growth rates experienced in those regions were high. But as agriculture growth rates slowed the peace of poverty reduction declined. He concludes that if growth occurs leaving agriculture sector out the overall growth rate will be lower and the component of growth that reduces poverty will be missing. He also emphasises that rapid agricultural growth rates in modern times can be achieved more easily but it requires overt action by the Government. Mellor needs to be complimented for forcefully pleading the cause of agri. development in efforts aimed at reducing the

poverty. Many of the developing countries should benefit from Mellor's prescription provided they follow it truthfully.

Mellor has pointed out that the institutional reforms recommended by the World Bank, Asian Development Bank and the pilot projects under way in Pakistan are expected to sort out the problems in the irrigation system and point out the scope for further improvements. I wish the results of these projects were available to confirm the optimism of John Mellor for poverty reduction on this count.

Prof. Mellor has emphasised the role of high value crops in realising high growth rate in agriculture. I do not want to sound skeptical to his prescription but one has to take into account the ground realities such as: (i) recent progress in this context, (ii) reluctance of the developed countries to open their markets, (iii) technical and capital requirements for shifting from low value to high value crops, (iv) perishable nature of the produce, (v) high transport and packing costs, (vi) extend of market, and (vii) infrastructural requirements to support this type of agriculture.

For achieving high growth rate in the agriculture sector there is still a vast potential through improving the productivity of resource use in agriculture. The average yields of field crops obtaining on majority of the farms are much less than the corresponding yields obtained by 'progressive' farmers, using judicious mix of inputs and technological developments. However, this would require addressing the socio-economic and technological problems culminating in low yields on majority of the farms.

The recurrence of water shortages and drought during the critical period of crop growth in the recent years have adversely affected performance of agriculture in Pakistan and its potential for reducing poverty. It has also thwarted the efforts aimed at cultivation of high value crops. No doubt investments in agricultural research, education and extension have high pay offs. However, the system in recent past has suffered from lack of leadership due to rapid turn over at the top. The uncertainty surrounding the institutional set up in the wake of right sizing and downsizing has also demoralised the scientists. Accordingly, a number of experienced as well as upcoming researchers have been forced to seek green pastures elsewhere, resulting in out migration of highly scarce resources and brain drain. Such a climate and environment do not bode well for the development of technology and investments in the sector. The comparative advantage enjoyed by Pakistan in the production of many farm commodities has not been translated into comparative advantage in international trade because of poor infrastructure, high incidentals and lack of quality control. The recent graduation of Pakistan from the import regime to export regime in wheat/sugar has highlighted a number of problems and issues: (i) low prices for the growers, and (ii) problems of storage and quality etc.

The costs of inputs and field operations have been rising as subsidies were phased out and general sales tax imposed on the inputs. The commodity prices have

either stagnated or declined, eroding the purchasing power of farmers. The instability, both of production and prices has not helped the cause of poverty reduction in rural countryside. Achieving high growth rate in agriculture requires investment in research, technology production and adoption and the conducive environment in the form of favourable price relationships. In view of the increasing commercialisation marketing of inputs and outputs has assumed critical importance in agriculture. The inefficiencies in the marketing of farm commodities have badly hurt the farmers resulting in low prices of the produce and large scale resource transfers from agriculture. In fact, marketing has emerged as the most important problem in Pakistan's agricultural development in the last few years.

In view of the foregoing situation and instability in agricultural growth rate experienced in recent years, the achievement of sustainable growth rate of 5 to 6 percent, required to raise the per capita income sufficiently rate to make a dent on poverty would be really a challenging task. This would require a careful analysis of the emerging policy issues and adequate investment of resources, both material and human capital, in accordance with the importance and potential of the sector. Without the development of agriculture the efforts aimed at poverty reduction are unlikely to succeed.

In closing, I would like to express my deep gratitude to the Pakistan Society of Development Economists for inviting me to participate in their annual Conference and discuss a very interesting paper.

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