

Andrew Dorward, Jonathan Kydd, Jamie Morrison, and Ian Urey.

## **A Policy Agenda for Pro-Poor Agricultural Growth**

**Imperial College of Science, Technology and Medicine**

**Imperial College Wye**

**ADU Working Paper 02/02**

Email contact: [A.Dorward@ic.ac.uk](mailto:A.Dorward@ic.ac.uk); [J.Kydd@ic.ac.uk](mailto:J.Kydd@ic.ac.uk); [J.A.Morrison@ic.ac.uk](mailto:J.A.Morrison@ic.ac.uk);  
[I.Urey@ic.ac.uk](mailto:I.Urey@ic.ac.uk)

**Imperial College Wye, Wye, Ashford, Kent TN25 5AH  
United Kingdom**

**Tel +44 (0)207 59 42679**

Paper presented at the Agricultural Economics Society Conference, Aberystwyth,  
8<sup>th</sup> – 10<sup>th</sup> April 2001

This paper is written under a research project on *Institutions and Economic Policies for Pro-poor Agricultural Growth* funded by the Department for International Development of the United Kingdom (ESCOR Project R7989). The findings, interpretations and conclusions expressed in this paper are entirely those of the authors and should not be attributed to the Department for International Development, which does not guarantee their accuracy and can accept no responsibility for any consequences of their use. The paper has benefited from helpful comments from colleagues in the research project (see <http://www.wye.ac.uk/AgEcon/ADU/research/projects/ppag/index.html>) and from Stephen Devereux, Karam Singh, Martin Greeley, Hemasiri Kotagama, and Stephen Carr. A longer and fuller version of this paper is available from the authors.

Copyright 2002 by the authors. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

## **Abstract**

Economic growth has been low and the incidence and numbers of poor people remain very high in some parts of the world, notably in sub Saharan Africa and some parts of South Asia. Projections for poverty reduction suggest that these regions are likely to continue to hold very large numbers of very poor rural people in the foreseeable future. Theoretical arguments and empirical evidence suggest that in poor agrarian economies both the processes of structural change within national economies and micro-economic relations within rural economies give agriculture (and particularly intensive cereal based growth) a pre-eminent and unique role in economic development and in poverty reduction. However, reliance on pro-poor agricultural growth as the main weapon against rural poverty today faces more difficult challenges than those faced in the green revolution areas in the latter part of the 20<sup>th</sup> century, due to a number of features that together increase risk and uncertainty and raise costs and/or lower returns to agricultural investment. Many of these difficulties are endogenous to today's poor rural areas, others result from broader processes of global change, but it is argued that some are the direct result of policies supporting liberalisation and withdrawal of the state. A review of the green revolutions of the 20<sup>th</sup> century suggests that state interventions in agricultural markets were widely used and important in supporting sometimes short periods of critical market and technological development in the process of rural growth. Unfortunately the benefits of such interventions have been overlooked as a result of their very evident inefficiency and high costs, without a clear understanding of their institutional benefits. Policy and research implications of this analysis are discussed.

# **A Policy Agenda for Pro-Poor Agricultural Growth**

Andrew Dorward, Jonathan Kydd, Jamie Morrison, and Ian Urey.

Imperial College of Science, Technology and Medicine.

## **1 Introduction**

Agriculture remains an important part of the livelihoods of many poor people, and it is frequently argued that agricultural growth is a fundamental pre-requisite for widespread poverty reduction. Paradoxically, however, economic growth and poverty reduction lead to declining importance of the agricultural sector relative to other sectors. This, together with increasing recognition of the diversity of poor rural people's livelihoods and with difficulties in 'getting agriculture moving' in areas where most poor rural people live, has led some to question both the importance of agriculture for rural economic growth and poverty reduction and the benefits of attempts to directly promote agricultural growth and development.

This paper examines these arguments. Following this introduction we briefly examine the main characteristics and extent of global and regional rural poverty, and the way it has changed over the last 30 years or so. We then examine the theoretical and empirical arguments for relying on agricultural growth as an engine for poverty reduction and the difficulties facing agricultural growth in today's poor rural areas. Our conclusions pose serious challenges to current policy.

The issues addressed in this paper are not new: they have been the subject of a large literature. However, they need to be reassessed to take account of: (a) continuing difficulties with getting agriculture moving in areas where rural poverty is most intractable (parts of South Asia and much of Sub Saharan Africa); (b) increasing recognition of rural livelihood diversification; (c) the processes of globalisation; (d) changing policy environments; and (e) new understanding of the roles of institutions in promoting or inhibiting economic activity and access to economic opportunity.

## **2 World Poverty: Mixed Success and Failure in Poverty Reduction**

Examination of changes in poverty incidence over the last 30 years and of projections over the next 20 years or so reveal both considerable progress in reducing poverty incidence (using income measures) globally and in some parts of the world, but shocking persistence and growth in other parts of the world in the numbers of people living in poverty. The problem of poverty is highly regionalised and this concentration is intensifying. South Asia and Sub-Saharan Africa are becoming the core areas for absolute poverty (World Bank, 2000b) and now contain 70% of the world's poor. South Asia is home to over 40% of the people categorised as poor under the \$US1 per day line. Although the share of population living in poverty declined moderately in South Asia from 1987 to 1998, it was not enough to reduce the absolute number of people living in poverty. The depth and severity of poverty is at its worst in Sub-Saharan Africa. Looking to the future, whilst predicted poverty reduction scenarios vary greatly depending upon the rate and nature of growth and the poverty focus of policies, actual evidence suggests that in the 1990's global poverty reduction was less than half the rate needed to meet the commitment to halve poverty by 2015. In Sub-Saharan Africa, it was too low by factor of 6 (Hanmer *et al.*, 2000).

Within these regions, poverty is largely a rural phenomenon. Estimates of the proportion of the world's poor that live in rural areas range from 62% (Pinstrup-Andersen *et al.*, 2001) to 75% (IFAD, 2001). IFAD predict that rural and urban poverty will not be at the same level until 2035. Rural poverty also tends to be deeper than urban poverty (see for example Bird *et al.*, 2001). Lipton, 2001, quotes IFPRI as noting that increasingly, the rural poor are concentrated in arid, semi-arid and unreliably watered areas

### **3 Agricultural growth and poverty reduction: lessons from the past?**

#### **3.1 Regional patterns of agricultural growth**

The agricultural sector in LDCs over the last thirty years or so shows low rates of growth in the 1980s and 90s, and indeed negative rates are recorded for value added per capita over most of the period (World Bank, 2000b; FAO, 2000, Dorward and Morrison, 2000). LDC performance (with a preponderance of Sub-Saharan African countries) contrasts with Asian performance: in both East and South Asia agricultural growth advanced well ahead of population growth, with continuing increases in labour productivity in agriculture. In Sub Saharan Africa, however, agriculture grew at a rate below overall population growth from 1965-1998, and at a lower rate than growth in the agricultural labour force from 1980-1998. It also appears that Sub-Saharan Africa is achieving its agricultural growth largely through a different process from that found in other regions. While South Asia is unique in not increasing total cultivated area in the 1980s and 90s, and thus experienced a large reduction in area per capita, the East Asia and Pacific region maintained its average area cultivated per capita. Sub Saharan Africa, however, stands out for having increased its area under cereals dramatically at the expense of other crops, whereas in other regions the area under cereals has either declined or increased only slightly. Sub Saharan Africa's increased cereal area is accompanied by a slight fall in overall fertiliser consumption, a larger fall in rate of fertiliser use, and only a small rise in cereal yields. The area of irrigated land also shows only a small rise. As a result, whereas other regions are estimated to have achieved 80% or more of their increased cereal production from yield increases, in Sub-Saharan Africa more than 70% of increased cereal production appears to be from area increases.

Despite the heterogeneity within each region, there is a striking correspondence between these patterns of agricultural growth and the patterns of poverty reduction (or of persistence) reported above. What then is the role of agricultural growth in poverty reduction? We discuss two main strands of (related) theory concerned with the role of the agricultural sector first in wider economic development, and second in the rural economy.

#### **3.2 The role of agricultural growth in poverty reduction**

Early in the 1960s, Johnston and Mellor, 1961, argued that in the early stages of development in agrarian dominated economies, agriculture generates export earnings, labour, capital and domestic demand to support growth in other sectors, and agricultural products meet increasing domestic demands from increasing populations with high income elasticity of demand for food. In a recent article, Mellor, 2000 (p3) argues that "there has been a tendency to generalise that economic growth reduces poverty, when in fact it is the direct and indirect effects of the agricultural growth that account for virtually all the poverty decline". Empirical evidence from the sectoral productivity literature supports the view that agricultural growth promotes poverty reduction (see the review by Thirtle *et al.*, 2001 citing evidence from Hanmer and Nashchold,

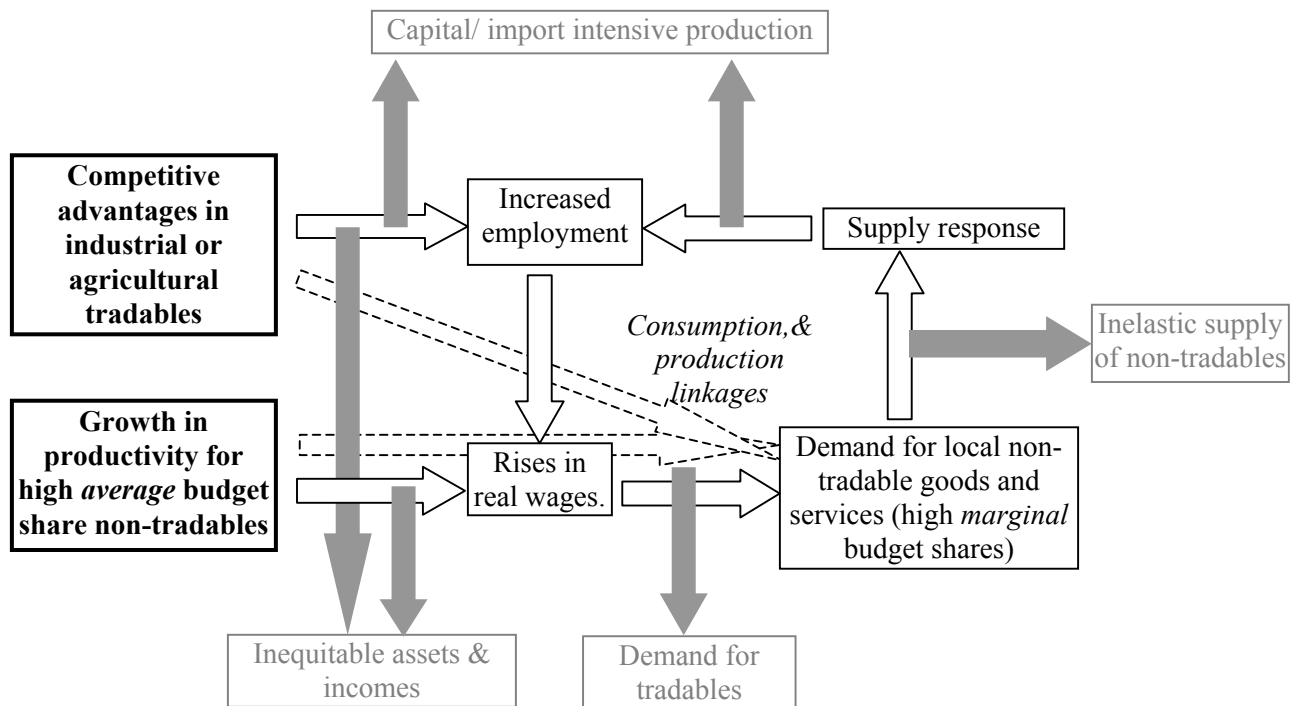
2000;; Ravallion and Datt, 1999; Timmer, 1997; Datt and Ravallion, 1996; Stern, 1996; Matsuyama, 1992; Kogel and Furnkranz-Prskawetz, 2000; Irz and Roe, 2000; Kanwar, 2000; Rangarajan, 1982; and Wichmann, 1997).

A long-standing theoretical and empirical literature has examined the linkages between different activities within rural economies (for recent reviews see for example (Delgado *et al.*, 1998, and Dorward *et al.*, 2001). Examination of linkages allows exploration of the effects of exogenous change as they work through different elements of the rural economy. An important conclusion from the linkage literature is that the effects of particular changes on a rural economy and on poor people within it depend crucially upon the nature of the change, on the structure of the local economy, and on different poor peoples' places within it. Regard must be given to the local demand characteristics of goods affected by price or productivity change (their average and marginal budget shares for different income groups), tradability, and local production characteristics (supply elasticities, labour and tradable input demand, upstream and downstream linkages) as well as the operation of factor markets that affect both elasticity of supply and the distribution of income within the rural economy (see figure 1). It is also helpful to distinguish between three different processes by which productivity changes may impact on poverty: by initially stimulating basic (poverty reducing) growth; by support to (particularly consumption) linkages that provide the poor with second round benefits from basic growth; and by redistribution of market and income shares between income groups. All three processes, and particularly the first two, are important for sustained poverty reduction.

How do growth in the farm and non-farm sectors compare with regard to these characteristics and hence their likely poverty reducing benefits? There are unlikely to be many *tradable* non-farm activities apart from mining that offer broadly based employment opportunities in the poorest (relatively low income and isolated) rural areas<sup>1</sup>. Only as links with urban areas develop will opportunities for non-farm tradable activities develop, but these will often be 'high barrier to entry' activities, limiting the benefits to the poor (Barrett *et al.*, 2000). Farm activities, on the other hand, are more likely to offer opportunities for broadly based expansion in tradable activities (whether cash crops or tradable food crops), with direct and indirect employment and income opportunities for the poor, again depending upon barriers to entry associated with, for example, the nature of the crop, marketing systems, access to land, etc.. Even here the poor are unlikely to gain much directly as self-employed producers of tradable agricultural commodities, with limited access to land and capital and relatively low on-farm incomes. However, there is often considerable potential for them to benefit directly (from increased labour demand from significant numbers of less poor farmers producing tradables) and indirectly (through increased demand for non-tradables from these farmers). The challenge is then to improve the access of less poor farmers to the skills, capital, inputs and output markets to allow them to respond to opportunities in production of farm tradables, and to improve access by the poor to linkage benefits.

---

<sup>1</sup> See Wiggins, 2001 for a fuller discussion of these issues. Tourism and crafts may also offer opportunities for non-farm tradable activities, but, as with mining, areas with these opportunities are likely to be the exception rather than the rule. Migrant labour and remittances may also be considered a form of tradable, exporting labour to bring extra income into an area.



**Figure 1. Linkages and leakages in a rural economy**

Growth and poverty reduction through increased productivity of *non-tradables* will be effective as a basic source of poverty reducing growth where the non-tradable is widely consumed (i.e. has a high *average* budget share), either by the poor themselves or by a large non-poor population (with consumption linkage benefits for the poor) High average budget shares for food crops in rural areas in Africa (Delgado *et al.*, 1998) suggest that farm activities are more likely to meet these criteria than non-farm activities. Growth and poverty reduction through increased productivity of non-farm non-tradables with high *marginal* budget shares is more likely to be important as a secondary growth process, supporting consumption linkages. Institutional or technological change in non-tradable production may also have important redistributive effects by bringing down barriers to entry for poor producers and allowing them to gain market and income shares from less poor producers, as well as lowering prices to poor consumers.

These arguments are summarised in Table 1. A broad conclusion, to which there will be significant exceptions, is that in many poorer rural areas increasing productivity of farm activities will have greater potential for stimulating poverty reducing growth. Increased productivity of non-farm activities is likely to have greater poverty reducing benefits in supporting secondary, linkage dependent poverty reducing growth, again particularly if the activities have low barriers to entry and high labour demands. It can be further argued, from historical experience and from examination of the linkage and budget share characteristics of different types of agricultural production, that within agriculture, intensive cereal based growth

offers the best prospects for sustained poverty reducing growth (see for example Dorward and Morrison, 2000)<sup>2</sup>.

These conclusions tie in well with conclusions from the wider sectoral econometric studies. They also agree with conclusions in a recent review of poverty reducing growth strategies for Africa (Fafchamps *et al.*, 2001) which argues that while higher rates of growth achievable in export manufacturing may make it theoretically the best sector to support poverty reducing growth, in practice ‘only a handful’ of African countries will be able to achieve this, so that ‘the 45 or so other African countries that do not become export platforms must rely on other engines of growth: agriculture, mining tourism or a combination of them’ (Fafchamps *et al.*, 2001, p13). The problem here is that many countries do not have very good prospects in mining and tourism, and these activities often have weak linkages and high leakages in supporting secondary growth processes.

#### **4 Difficulties facing agriculture in today’s poor agrarian economies**

The previous section has argued that in poor agrarian economies both the processes of structural change within national economies and micro-economic relations within rural economies give agriculture a pre-eminent and unique role in economic development and in poverty reduction. We now turn to consider some of the difficulties that agrarian economies currently face in agricultural development and particularly pro-poor agricultural development

Despite the strong arguments presented above for agriculture having provided the main engine of growth for rural poverty reduction in the past, reliance on pro-poor agricultural growth as the main weapon against rural poverty today may not be appropriate if the areas where today’s rural poor are concentrated (sub Saharan Africa and parts of South Asia) face more difficult conditions than those that faced the green revolution areas in the latter part of the 20<sup>th</sup> century. We consider three ways in which conditions within present poor rural areas may differ from those of the green revolution areas at the start of the green revolution: local conditions, global conditions, and policy conditions. We consider these in turn.

---

<sup>2</sup> The importance of oilseeds in India’s second (rainfed) green revolution challenges the argument that intensive cereal based transformations have historically provided the most sustainable and pro-poor pattern of growth. However in the Indian context oilseed crops may have many characteristics of cereals as regards their linkages within a large domestic market, and oilseed growth has been associated with growth in cereals. This is a topic that needs further examination.

**Table 1: Potential of Farm and Non-farm Productivity Growth in Reducing Rural Poverty**

	<b>Tradable</b>	<b>Non tradable</b>
<b>Farm activities</b>	Direct gains if high labour content by poor producers or large upstream / downstream linkages have high labour content by poor producers	Direct gains if high average budget share for poor consumers
		Indirect gains if high average budget share for non-poor consumers and the poor benefit from expenditure linkages
	Indirect gains if high labour content by the non-poor and the poor benefit from expenditure linkages	Potentially important gains from expenditure linkages for activities with high elasticity of supply and low barriers to entry and producing goods and services with high marginal budget shares (e.g. horticulture, livestock)
<b>Non farm activities</b>	Apart from mining, other NR activities and migrant labour/ remittances, unlikely without good communications and strong urban or export markets, features generally absent from poorer rural areas.	Limited direct or indirect gains as unlikely to have high average budget shares for poor or less poor consumers in poorer rural areas
		Potentially important gains from expenditure linkages for activities with elasticity of supply and low barriers to entry producing goods and services with high marginal budget shares (e.g. services)

## **4.1 Local conditions**

### **4.1.1 Agro-climatic conditions**

It is difficult to make simple but meaningful comparisons on the relative productivity and potential of land in different areas, as even data on the major regions of the world are difficult to obtain and these can mask important differences between green revolution and poorer, less favoured or marginal areas within regions. Data presented by Kydd *et al.*, 2001a, suggest that agro-ecosystems in sub Saharan Africa tend to have more varied, more complex and more site



specific constraints than those in South Asia, and a greater proportion of cultivated land is subject to soil fertility constraints to agricultural production. The proportion of land with irrigation potential is much lower in Sub Saharan Africa and in less favoured areas in South Asia as compared with East Asia, and the proportion of crop land under irrigation is still much lower now than it was in Asia at the onset of the green revolution. Furthermore, Africa derives its irrigation supplies primarily from local rainfall, not from more predictable snow and groundwater. Irrigation is therefore less capable of functioning as a drought proofing investment in much of Africa.

A varied agro-ecology in a region with limited irrigation and more inter-year variation implies that a wider range of technological solutions is necessary. This raises unit costs (per hectare and per capita) of agricultural research, information and other service delivery. In addition, in semi arid rain-fed systems high year to year rainfall variation constrains farmers' crop choice in favour of crops that even in erratic rainfall areas still produce a minimum yield, and both lowers returns to investment in agricultural intensification and makes such investments much more risky.

Many poorer rural areas are dependent on grains as food staples: maize, rice, sorghum, wheat, millets and teff. As the first four crops (if not the specific types) are widely grown elsewhere in the world, there is the potential to benefit from R&D on these crops undertaken elsewhere. However, different conditions and management often demand different technological solutions. There are also large areas where roots, tubers and bananas/plantains are the staple crops. These can achieve high yields, but there are concerns about rapid soil mining, vulnerability to diseases and challenges to intensification. Tradability is limited by a high bulk/nutrient ratio and (for some crops) rapid post-harvest deterioration. R&D requires substantial increases in resources and management and will be less able to draw on work performed elsewhere.

#### 4.1.2 Population Density

Aggregate rural population density in Sub Saharan Africa has now caught up with densities in South Asia in the early 1960's, but is still some way behind East Asian densities at that time (World Bank, 2000b). Rural population densities aggregated to this level can be misleading, hiding important local variations, and population densities in some parts of Africa are very high. Paradoxically these high densities in some areas mean below average densities in other areas, resulting in high costs in infrastructural development, service provision and trade, and inhibiting the evolving intensification of farming systems (Boserup, 1965, Ruthenberg, 1980, Pingali *et al.*, 1987, and Binswanger and McIntire, 1987). Whereas some of the high population density areas do support processes of intensification, others are too crowded and poor, and suffer more from involution (Turner *et al.*, 1993; Tiffen and Mortimore, 1994; Carr, 1997). Goldman and Smith, 1995, suggest that provided road infrastructure is good, population densities may not be a critical constraint to agricultural intensification, although extremely low or high population density may be a constraint<sup>3</sup>.

---

<sup>3</sup> However costs per person in developing road infrastructure are likely to be higher with low population density.

#### 4.1.3 Human Capital

Literacy rates in South Asia and Sub Saharan Africa are now comparable with those in East Asia in 1970 although South Asian female literacy rates remain very low (World Bank, 2000b). A similar pattern exists with regard to some measures of human health, with current figures for South Asia and Sub Saharan Africa matching those in East Asia in the 1960s. However the prevalence of malnourished children is very high in South Asia but declining faster than in Sub Saharan Africa, with the result that the number of malnourished children declined 7% in South Asia between 1970 and 1995, but increased by 68% in Sub Saharan Africa (Smith and Haddad, 2000). The impact of HIV/AIDS will be discussed later.

#### 4.1.4 Communications Infrastructure

A number of authors (for example Turner *et al.*, 1993; Goldman and Smith, 1995) suggest that good road access is critical for agricultural intensification. The density of paved roads varies between Africa countries and is very low in 1990 as compared with India in 1960, although comparable with some other Asian green revolution countries in 1960 and 1970 (World Bank, 1994). However, only 10% of roads in Africa are paved, compared with 35% in Asia (Platteau, 1996) and average road density in SSA is 34 m/km<sup>2</sup> (with individual states' values ranging from 30 to 490 m/km<sup>2</sup>) compared with 500m/km<sup>2</sup> in India (Riverson *et al.*, 1991; Doyen, 1993). When measured per km<sup>2</sup> of agricultural land, Africa stands at 160 m/km<sup>2</sup> compared with 380 m/km<sup>2</sup> in South America, 450 m/km<sup>2</sup> in Asia and 520 m/km<sup>2</sup> for the world as a whole (Hine, 1993). Furthermore, during the 1980s, roads in Africa deteriorated to such an extent that more than half of paved roads and 80% of main and local unpaved roads were in poor to fair condition (Riverson *et al.*, 1991). In addition, a number of studies have compared estimates of transport costs in Asia and Africa (for example Doyen, 1993; Platteau, 1996; Hine *et al.*, 1997) with the general finding that transport costs (using trucks) are higher in Africa than in Asia.

Aggregate figures on densities of telephone lines per person are not low in Africa or South Asia as compared with East Asia prior to 1990 (World Bank, 2000b). These may be misleading, however, as they provide little indication of relative access to telephones: in areas of low population density a high density of lines per person may not result in higher access as compared with a high population density area with a lower density of lines. However, the rapid spread of cell phone systems offers the potential for dramatic and low cost access to phone services in rural areas.

### 4.2 ***Global conditions***

#### 4.2.1 Falling world commodity prices

There is a clear downward trend in real prices for primary agricultural commodities, as agricultural prices have trended downwards since the 1960s (World Bank [http://www.worldbank.org/data/wdi2001/pdfs/tab6\\_4.pdf](http://www.worldbank.org/data/wdi2001/pdfs/tab6_4.pdf)). Although the overall decline was greater than 50%, it occurred mainly in the 1980's. During the 1990's the decline has been more gradual, reflecting an initial increase in prices.

The IFPRI IMPACT model predicts continued (modest) falls in prices up to 2020, while World Bank projections over the period 2000 to 2005 are for a gradual increase in the real price of grains, but a continuing decline in the real prices of fats and oils and of beverages

(<http://www.worldbank.org/prospects/gcmonline/subscriber/0002/appendix.pdf>). However, even with this gradual increase predicted for grains, real prices are likely to be lower than in the 1970s and 80s. Today's poor farmers therefore tend to face more adverse terms of trade than their green revolution predecessors, reducing both the incentives to engage in the production of tradables and the gains and economic stimulus from such production. This is exacerbated by the globalisation of markets within the world economy as semi-tradables become tradables and local prices fall towards world market prices – further reducing the terms of trade for poor farmers and also potentially weakening local demand for non-tradeables and its positive effects on consumption linkages and growth. Low food prices may benefit large numbers of poor rural food deficit households and the urban poor. It is not clear what the overall relative balance will be for poor rural households between the direct benefits of low food prices and the (indirect) effects of low product prices on employment and growth in the agricultural sector.

#### 4.2.2 Population structure

High rates of population growth due to declining child mortality rates in developing countries have led to increasingly young populations. This initially results in high dependency ratios but then declining child mortality later leads to a fall in fertility and then a period of falling dependency ratios, a 'demographic window of opportunity' (IFAD, 2001). Current dependency ratios in Sub Saharan Africa countries tend to be higher than ratios in green revolution countries in the 1960s and 70s but in many countries are predicted to fall to similar levels over the next 15 years or so (IFAD, 2001). This is expected to occur despite the counteractive effect of HIV/AIDS, which will increase the number of orphans and reduce the economically active population, with deaths particularly affecting women in the 15 to 30 year age group in Africa. The HIV/AIDS tragedy will, however, have other serious effects, undermining savings and attacking the social, human and financial capital of the rural poor.

#### 4.2.3 Urbanisation and non-farm incomes

Urbanisation has proceeded rapidly throughout the developing world. Regional rates of urbanisation are broadly equivalent, thus urban influences tend to be much greater on today's poor rural areas than they were in green revolution areas 30 years ago (World Bank, 2000b).

Rapidly growing urban areas need supplying with food and this may change the focus of agricultural policy aims away from income generation and poverty alleviation for the rural poor to the need to deliver cheap food for the urban areas. However, this may not benefit poor farmers if low world food prices and poor rural transport systems make it cheaper and easier to provision major cities from international markets rather than by investing in rural infrastructure and services to promote domestic production.

Related to this is the question of the relative importance of the farm and non-farm economies in poor rural areas. Recent literature has stressed the importance of livelihood diversification amongst the rural poor. It is not clear how much of this is a result of increased recognition of this by researchers and analysts, but there is evidence that the non-farm income share has been increasing in both Asia and Africa (Reardon *et al.*, 2000; Bryceson, 1999) although the causes and processes of such diversification are likely to be different in different areas (Reardon *et al.*, 2000). Bryceson suggests that much of the non-farm diversification in Africa in the late 80s and 90s has been the result of a 'push' out of agriculture, as smallholders have been caught between

the scissors of declining profitability of and support for commercial smallholder agriculture on the one hand, and increasing needs for cash to pay for school and health fees and for increasingly expensive consumer goods on the other. Rosegrant and Hazell 2000 suggest that increasing non farm income shares in most Asian countries have occurred as part of the process of agricultural growth and structural transformation described earlier – with more healthy ‘pull’ factors predominating. Reardon, 1998, suggests that in livelihood diversification in Africa and South Asia much non-farm income is predominantly dependent on agricultural activities.

Reardon *et al.*, 2000, also note that there appear to be differences between regions in the relationship between household incomes on the one hand and the share and level of non-farm income on the other. They postulate that in Africa, where a positive or U shaped relationship between total incomes and non-farm income share predominates, this arises as a result of a lack of ‘low barrier to entry’ labour intensive earning opportunities, with consequent crowding and low returns as discussed earlier in the context of ‘push’ factors in diversification. Bryceson, 1999, develops a related categorisation of three broad diversification ‘complexes’ within SSA and stresses the importance of investment and consumption linkages and of agricultural income as an important determinant of demand for local services and for local purchase of traded goods.

#### 4.2.4 Technology

The last few years have seen a revolution in bio-technology, with major advances in molecular biology and the advent of GM crops. This has been associated with a decline in public funded research and increasing activity by multinational corporations, with research resources concentrated on problems facing large numbers of commercial farmers: specific, applied research on problems facing poor farmers in less favoured areas is largely ignored (Pingali, 2001) and there are concerns that small farmers are also likely to lose out in cash crop production although there are also potential benefits of developing new varieties more quickly and cheaply to better address poor farmers’ problems (Kydd *et al.*, 2000). This scenario contrasts with the major emphasis on food grain varietal development that underpinned the green revolution.

#### 4.2.5 Globalisation

The impact of globalisation on the rural poor can be examined in terms of its effects on them as producers and consumers, and in terms of the effects of inclusion in and exclusion from the global economy. Globalisation should pose opportunities for producers through wider access to output markets, technology, ‘know how’, finance and inputs, but there are questions as to how far this will support agricultural growth in poor agrarian economies, and where it does, if this will be pro-poor. As discussed earlier, expanded market access to output markets is not likely to favour food grain producers and thus will not support the intensive cereal based pattern of growth that has driven broad-based rural poverty reduction in green revolution areas, and indeed in these markets globalisation may pose more of a threat. There is more optimism that globalisation poses more opportunities for intensive export based patterns of growth, particularly opening export markets for non-traditional crops, for example in fresh horticultural produce (World Bank, 2000a). However, many of today’s poorer areas are characterised by poor transport infrastructure and even where such infrastructure exists there are increasing concerns that such growth may be concentrated in enclaves of larger commercial farms with limited poverty reducing upstream, downstream and expenditure linkages: its potential poverty reducing

benefits may thus be over-emphasised (e.g. Kydd and Dorward, 2001; Kaplinsky, 2000). There is also little evidence that globalisation of financial markets will expand the supply of capital to smallholder agriculture in poorer areas.

Kaplinsky, 2000, uses value chain analysis to make a more general argument that for suppliers of goods and services the long run benefits of globalisation are concentrated in intellectual property rights, knowledge and governance, where barriers to entry allow firms to retain rents in otherwise competitive markets. This ties up with arguments that the transaction costs of coordinating and ensuring timely delivery of quality assured products militate against small producers (Kydd and Poulton 2000). This suggests that the processes of globalisation may have little to offer the majority of the rural poor in terms of higher tradable production, higher produce prices, or linkage effects<sup>4</sup>.

As consumers the rural poor may have more to gain from lower food prices, but here too the benefits may be limited by high transport costs into rural areas and by high average budget shares for food, and therefore limited benefits from reduced prices for imported manufactures.

#### 4.2.6 Conflict.

South East Asia was by no means free from conflict before or during the Green Revolution period. However, the green revolution occurred most dramatically in politically stable situations, often involving physical and social reconstruction following conflict, and often supported by global political interests which saw such reconstruction as well as the green revolution as an important weapon against the red revolution. Although it is too early to say how the global political environment has changed following the events of September 11<sup>th</sup> last year, global political interests in the 1990s did not place such emphasis on agricultural growth in developing countries. Meanwhile internal conflicts have become increasingly concentrated in Africa, with nearly 40% of internal conflicts found in Sub-Saharan Africa (UNHCR, 2000) while of the 41 countries in Sub-Saharan Africa, 17 are currently or have recently been categorised as “chronically political instable” (World Bank quoted by Farrington and Lomax, 2000)

### 4.3 *Policy conditions*

Over the last twenty years or so there has been a major shift in dominant policy thinking, with increasing recognition of state failure and a move from direct state intervention towards state provision of an enabling environment for private sector and civil society, with a stable macro-economic environment, liberalised markets, tighter fiscal regimes, and a more developed institutional environment. This is closely associated with the process of globalisation discussed earlier and contributes to major differences in the institutional and economic environment facing agriculture in poor rural areas.

There has also been a large reduction in official investment in agricultural development. Many policy makers do not currently consider investment in agricultural development the best bet for poverty reduction as there is increasing recognition of the importance of non-farm incomes and

---

<sup>4</sup> There may be market opportunities for organic, non-GM and ethical products, but these markets are likely to be limited and themselves involve information costs in assuring compliance with standards and are unlikely to drive large scale rural poverty reduction processes.

activities in the livelihoods of the rural poor and disillusionment with the lack of agricultural growth, despite heavy investments in agricultural development in the past. At the same time it is considered that agricultural development in more marginal areas may be more difficult and that many of agriculture's problems lie outside the agricultural sector (in roads and telecommunications infrastructure, and in governance, for example). There are also limited prescriptions for direct investment in agriculture, with doubts about the effectiveness of research and extension, and concerns about recurrent costs, fiscal commitments, and appropriate models for finance and delivery (Kydd and Dorward, 2001).

These latter points, together with the overall policy paradigm, lead to what Kydd and Dorward, 2001, term the 'agricultural investment dilemma': even where the importance of agriculture is recognised it is difficult for donors and governments to design and gain approval for specific agricultural investment programmes.

#### 4.3.1 The liberalisation agenda

A fundamental question here concerns the ways in which the liberalisation policies of the last 20 years or so have changed access to market services (for finance, inputs and outputs) in poorer rural areas. The main arguments for liberalisation rest upon the ineffectiveness and inefficiency of monopolistic and monopsonistic state service provision. Extensive evidence exists of parastatals' many failures: late delivery of services; large margins, increasing input prices and decreasing output prices; late and non-payments to producers; large fiscal deficits; rationing of services to exclude the poor; delivery of inappropriate services; and failure to innovate and develop markets. The roots of these problems are also well known: monopolistic and monopsonistic positions; lack of incentives to perform; overstaffing and patronage; political interference and multiple, contradictory objectives; lack of capital for investment; poor staff management and training; and corruption.

The policy agenda addressing these problems has focused on the intrinsic problems of state failure and called upon the discipline, incentives, and resources of private market systems and players to more effectively and efficiently perform these functions and respond to service demand from smallholder farmers. Action then involved removal of regulatory controls in agricultural input and output markets, eliminating subsidies and tariffs, and reforming and in some cases privatising agricultural parastatals. These policy changes have delivered positive impacts in many fields, for example in the supply chain systems for some cash crops in Africa, and in reduced food prices to poor rural and urban consumers (Jayne and Jones, 1997). However, in many situations, and particularly in the critical functions needed to kick-start cereal based intensive growth in poorer rural areas, there has been a notable lack of success, as the private sector has not moved in to provide farmers with input, output and financial market services that are attractively priced, timely and reliable. Whether the situation is worse or better than it was in the immediate pre-liberalisation period is debatable, and few would argue that the pre-liberalisation situation could or should have been sustained. However, a lack of substantial improvement and continuing difficulties are widely recognised, particularly with input and financial service delivery and with output marketing in remoter areas. The reasons for this lack of success, however, and consequent prescriptions to address it are debated.

One view is to argue that failure is not the result of the liberalisation agenda, but of failure to implement it thoroughly (see, for example, Kherallah *et al.*, 2000a; Jayne *et al.*, 2001). The main

thrust of the ‘too little liberalisation’ argument is that partial rather than complete withdrawal of the state together with policy reversals have meant that continued price controls and competitive advantages for parastatals (or even the threat of policy reversals) have depressed returns to private sector investment and created risks inhibiting investment. The solution to continuing failure is then to complete the market liberalisation process<sup>5</sup>, accompanied by other, often unspecified or general, measures to address problems in financial markets and affecting remote producers: for example institutional innovations for input credit (such as contract farming and group approaches); increased investment in infrastructure, legal and market institutions, and agricultural support organisations (research and extension); promotion of smallholder production of export crops; short term targeted support to vulnerable groups in remote areas (presumably safety net transfers); and credible sustainable macro-economic policies.

#### 4.3.2 ‘New institutional’ arguments

Another ‘new institutional’ view (see for example Dorward *et al.*, 1998, Kydd *et al.*, 2001b) argues that one important reason for states’ often half hearted commitment to liberalisation, particularly in food crop markets, is their recognition that pervasive market failures prevent the private sector from delivering the necessary services, and policy makers’ consequently continue to attempt to intervene to remedy these failures. This view does not deny that continued intervention or threat of intervention is also the result of short term political economy considerations and further impedes private sector investment, nor that the pre-liberalisation situation was unsustainable and needed drastic reform. However, it does suggest a different emphasis in the continuing search for more successful agricultural market and supply chain development to support food crop production in poorer rural areas.

The essence of the ‘new institutional’ argument is that the very low level of development in the institutional environment of poor rural areas, together with a low density of transactions, leads to very high transaction risks and costs<sup>6</sup> in financial, input, and output markets. This is particularly the case with financial markets and to a lesser extent with input markets. High transaction costs, exacerbated by low population densities and poor communications, lead to market failures, and as these market failures depress the level of economic activity, a vicious cycle of under-development results.

In this analysis a key ingredient in agricultural development is institutional development. Here the focus is not so much on institutions as organisations but on institutions as the ‘rules of the game’ (North, 1990), and in particular on both the ‘institutional environment’ (governing for example property rights and general relations between economic agents) and ‘institutional arrangements’ (the specific rules governing specific transactions) (Davis and North, 1971). Key functions of the state and of other actors promoting development are then to support institutional

---

<sup>5</sup> Jayne (pers.comm.), for example, argues that greater reform of food grain markets in West Africa as compared to East and Southern Africa, has been associated with greater agricultural growth rates (although it may also be relevant that there is greater urbanisation and also more millet and sorghum, and less maize, in West Africa).

<sup>6</sup> In the remainder of the paper the term ‘transaction costs’ will include what Dorward, 1999 defines as pure transaction costs, associated transaction costs, and associated risks.

development that will reduce the transaction costs of critical transactions: we focus here on financial, input and output transactions in the smallholder agriculture sector.

Thus far these arguments can be seen as supportive of the ‘too little liberalisation’ arguments and their policy recommendations as outlined earlier. However, new institutional arguments place a stronger emphasis on the importance of understanding the extent of transaction costs (particularly transaction risks) and on the importance of institutional arrangements in reducing these. It is argued that particular attention must be paid to finding institutional arrangements that overcome the transaction problems inherent in agricultural finance, as increased investment in seasonal inputs is a critical requirement for agricultural intensification and growth. Again, there are parallels with the ‘too little liberalisation’ calls for institutional innovations for input credit.

More fundamental institutional analysis, however, goes much further, questioning how far such calls are compatible with increasingly competitive input and output markets. We focus on three issues here.

First, analysis of transaction costs and contractual arrangements questions the fundamental advantages of competitive market systems in situations of high transaction costs and risks, high exposure to risk from asset specificity, and repeat transactions (Williamson, 1985). There are strong theoretical arguments explaining the existence of firms and of bilateral contracts (Coase, 1992), and these may also be applied to defend support for non-competitive contractual relations in the early stages of agricultural development. Dorward *et al.*, 1998 argue that ‘interlocking transactions’ are a widespread contractual form that addresses some of the transaction cost problems of input credit, but that there may be incompatibilities between interlocking arrangements and competitive input and output markets. They argue that there may indeed be benefits from monopsonistic crop marketing systems in supporting interlocking arrangements for seasonal input finance, although safeguards are needed to avoid abuse of market power and to provide incentives for firms to continually look for technical and managerial advances and efficiency gains (Kydd *et al.*, 2001b). These arguments, with theories of endogenous institutional innovation, provide some explanation for the development of interlocking systems by both cash and food crop marketing parastatals in Africa prior to liberalisation, and for development of these systems by some private companies engaged in marketing export crops (see for example Dorward *et al.*, 1998; Gordon and Goodland, 2000). They also explain the failure of such systems to develop or function in other situations, most notably in liberalised food crop production systems.

Second, where countries’ staple crop is either non-tradable (for example a perishable or bulky root crop or plantain) or semi-tradable (for example a grain crop in a land locked country, such as Malawi, with very high internal and/or external transport costs placing a large wedge between import and export parity prices) then natural, climatic variation between seasons may cause production to fluctuate above and below domestic requirements, causing large fluctuations in market prices, between import and export parity prices. If these price variations cross thresholds that significantly affect the profitability of investment in agricultural intensification, such as fertiliser application, then such investment may be severely curtailed by both lowered average returns to investment, and risk considerations. This then feeds into uncertainty for input and output traders, adding a further dimension to the vicious circle of high transaction costs, low institutional development, poor infrastructure and low levels of economic activity described above.



Third, recognition of this vicious circle leads to serious questions about the extent to which development of infrastructure and the institutional environment will be sufficient on their own to attract the private sector investment necessary to drive a cycle of increasing economic activity and lower unit transaction costs at a rate that will achieve significant poverty reduction. A critical role of government may be to intervene in financial, input and output markets, not necessarily to participate directly in these markets itself, but to reduce the transaction risks and costs facing private agents engaging in these markets. This point is not a new one, for example Rosegrant and Siamwalla, 1988, argued that governments should intervene in low volume seasonal finance markets to reduce transaction costs (but not to subsidise interest rates) only until volumes and institutional arrangements are built up and costs reduced. The bright side of this analysis is that if economic activity can be stimulated past a critical point, then high density of economic activity and development of institutions can lead to dramatic falls in transaction risks and costs. It is then important that governments quickly withdraw from expensive and distortionary interventions.

How does this analysis compare with government policies and interventions historically in areas that have successfully followed a path of intensive cereal based growth, and how do current policies in today's poor rural areas compare? To address this question Table 2 summarises some of the information needed for an initial analysis of policies in successful green revolution areas *at the time of transformation*<sup>7</sup>. The columns of the table may need some explanation.

- 'Price stabilisation' refers loosely to mechanisms reducing the impact of world price fluctuations or national production fluctuations on prices, whereas 'price support' refers to mechanisms that maintain prices above some guaranteed level – the two are often closely related.
- 'Dispersed guaranteed output markets', again related to price stabilisation and support, describes particularly active systems which provide farmers with access to local outlets for their produce at guaranteed prices (these prices possibly being lower than those that could be obtained in open markets).
- 'Interlocking' refers to provision of seasonal inputs on credit against guarantees of repayment through marketing of the crop output (Poulton *et al.*, 1998).
- Land reform refers to both redistribution of access to land and changes in tenurial relations for land users.

---

<sup>7</sup> No attempt is made to include very different processes involved in earlier transformations in many parts of Africa, associated with the spread of maize (replacing coarse grains), mosaic free cassava, and famine reserve legislation leading to increased food security, together allowing increased cultivation of cash crops (Belshaw, *pers. comm.*).

‘Green revolutions’ are presented in the table in a sequence that distinguishes between irrigated and rain fed systems.

**Table 2 Government Policies and Interventions in Green Revolution areas at the time of transformation**

**Irrigated systems**

Country	System	Years	Price stab- ilisation	Price support	Dispersed guaranteed output markets	Input subsidies	Seasonal finance delivery	Inter-locking	Infra-structure	Institutions, Services
Bangladesh	Rice (mainly)	1970s	Yes	X+, M-	Yes, & private markets	Yes	Yes	Some private arrangements	I,R.	R,E.
China	Rice (mainly)	1978-84	Yes	Yes	Yes	Yes	Yes	Yes	R,I	L, R, E, F.
Egypt	Wheat & rice	1990s	Yes	Yes		Removed in 90's			I	F, R, E.
India (1): Punjab	Rice & wheat	Early 1970s	Yes	X+, M-	Yes & private markets	Yes	Yes	Some private arrangements	I, R.	L,R,E,F.
Indonesia	Rice	1970s	Yes	X+, M-	Yes	Yes	Yes	No	I, R.	R, E, F.
Japan (1)	Rice	1900-20	High prices	High stable prices	Private markets	No	No		I	L, R, E, F.
Japan (2)	Rice	1950s	Yes	Yes	Private markets				I	R, E, F
Korea	Rice	1960s	Yes	Yes	Yes	Yes	Some		I, R.	R, E, F, L.
Malaysia	Rice	60s-70s		Yes		Yes	Yes		I,R	R, E, F, L.

Key : *Price support*: X+ above export parity, M- below import parity;

*Infrastructure*: R, roads; I, irrigation.

*Institutions and services*: L, land reform; R, research; E, extension; F, farmer organisations.

Table 2 (cont.) **Government Policies and Interventions in Green Revolution areas at the time of transformation**

**Irrigated systems (cont.)**

Country	System	Years	Price stab- ilisation	Price support	Dispersed guaranteed output markets	Input subsidies	Seasonal finance delivery	Inter-locking	Infra-structure	Institutions, Services
Mexico	Wheat	1950s	Yes	Yes	Yes +strong urban demand	Yes	Yes	No	I,R	L, E, R, F.
Philippines	Rice	60s-70s	Yes			Yes	Yes		I, R (but still constraint)	R, E, L (but still constraint)
Sri Lanka	Rice	60s-70s	Yes	Yes	Yes & private markets	Yes	Yes		I, R	R, E, L, F
Taiwan	Rice	1946-50	Yes	No, taxed	Yes	No	Yes	Yes	I, R.	L, R, E, F.
Vietnam	Rice	Early 1980s	Yes	Yes	Yes	Yes	Limited, constraint		I	L, O.

**Key :** *Price support:* X+ above export parity, M- below import parity; *Infrastructure:* R, roads; I, irrigation.

*Institutions and services:* L, land reform; R, research; E, extension; F, farmer organisations.

**Sources:** Ahmed, 1999; Barber, 1994; Bautista, 1999; Bhalla and Singh, 2001; Dong, 1987; Francks, 1984; Gonzales *et al.*, 1993; Kherallah *et al.*, 2000b; Lin, 1997; Longworth, 1987; Mahmud, 1999; Rosegrant and Hazell 2000; Salleh and Meyanathan, 1993; Sanderson, 1986; Tomich *et al.*, 1995; USDA, 1968; World Bank, 1993; Yamada and Hayami, 1979.

Table 2 (cont.) **Government Policies and Interventions in Green Revolution areas at the time of transformation**

### Rain-fed systems

Country	System	Years	Price stab- ilisation	Price support	Dispersed guaranteed output markets	Input subsidies	Seasonal finance delivery	Inter- locking	Infra- structure	Institutions, Services
India (2):	Rainfed (cereals, oil seeds)	Late 1980s	Yes	X+, M-	Yes	Yes	Yes	Some (private)	R	L, R, E.
Kenya	Rainfed maize	mid 60s +	Yes	No	Yes	?	Yes	No	R	R, E, L, F.
Malawi	Rainfed maize	1985-92	Yes	X+M-	Yes	Yes	Yes	Yes	R	R, E, F.
Nigeria	Rainfed maize	70s-80s	No	Strong urban demand	Strong private market	Yes plus service centres	No	No	R	R, E.
Zimbabwe	Rainfed maize	1981-85	Yes	Yes	Yes	Yes	Yes	No	R	R, E.

**Key :** *Price support:* X+ above export parity, M- below import parity

*Infrastructure:* R, roads; I, irrigation.

*Institutions and services:* L, land reform; R, research; E, extension; F, farmer organisations.

**Sources:** Bevan *et al.*, 1993; Carr, 1997; Eicher, 1995; Eicher and Kupfuma, 1998; Eicher and Staatz, 1998; Gabre-Madhin and Johnson, 1999; Gabre-Madhan and Haggblade, 2001; Goldman and Smith, 1995; Howard *et al.*, 1999; Mosley, 1993; Tomich *et al.*, 1995; Wiggins, 2000.

The validity of the evidence about agricultural transformation summarised in table 2, and of the conclusions drawn from this, may be challenged on a number of grounds.

- Some of the common elements noted in the table may not have been necessary for the transformations listed, whereas some other necessary conditions may not be included in the table.
- The table concentrates on intensive cereal based transformations of smallholder agriculture: there is very little information from successful transformations in Latin America. This focus is deliberate, reflecting arguments mentioned earlier that intensive cereal based transformations offer the greatest potential for linkage rich, sustained, pro-poor growth. However, it would be useful to examine the conditions associated with other types of agricultural transformation.
- A more thorough analysis would compare more systematically areas that have gone through a successful transformation with those that have not, and from this try to establish necessary and sufficient conditions for different agricultural transformations.

These challenges suggest an important research agenda. For the moment it is nevertheless useful to consider what may be learnt from the evidence at hand.

Initial examination observation of the table reveals a number of interesting features:

- Irrigated transformations tend to be Asian (with the exceptions of Mexico and Egypt), to have happened before the 80s (with the exceptions of China and Vietnam, where the introduction of market reforms and a shift away from a command economy removed critical constraints to transformation)<sup>8</sup>, and to have continued strongly. In contrast, rainfed transformations are much fewer, tend to be concentrated more in Africa, in the 80s, and to have been weaker in their breadth, depth and persistence, with subsequent regression in the 90s being common<sup>9</sup>. India provides a significant exception on the latter point, with its ‘second’ green revolution in the 1980s in rain fed areas (see for example Smith and Urey, 2002). This has been sustained and shows strong poverty reducing characteristics, but also builds on the achievements of earlier irrigated transformations.
- Almost every transformation is associated with local research and extension<sup>10</sup>. National rice and wheat research agencies’ commonly used outputs from

---

<sup>8</sup> China had already achieved quite widespread adoption of many technical features of the green revolution, with improved varieties, fertilisers and irrigation, but these had not been utilised sufficiently widely or effectively, largely due to lack of effective coordination and incentives promoting efficiency and effort.

<sup>9</sup> Similar regression, though from a less dramatic transformation, has occurred in other African countries not included in table 4.1, for example Zambia, Tanzania, Ghana and, in limited areas, in South Africa (Mosley and Coetzee, 2001).

<sup>10</sup> Vietnam is an apparent exception to this but the basic technologies for increasing rice yields were initially transferred from the International Rice research institute in the Philippines with subsequent development of stronger research and extension efforts coordinated at the provincial level.

international research centres as well as locally developed varieties. For (rainfed) maize there has been much less emphasis on varieties developed internationally and much more dependence on locally developed varieties <sup>11</sup>.

- Another almost universal factor is investment in road infrastructure <sup>12</sup>.
- The vast majority of transformations involved, in their early stages, government interventions to stabilise output prices and maintain them somewhere between import and export parity prices, and to subsidise input supply and credit. Interlocking arrangements for input credit also feature in a number of cases.

Taking these points together, and relating them to earlier discussion about agricultural growth and about the difficulties facing agriculture in today's poor agrarian economies, we postulate that there are certain necessary conditions for intensive cereal based transformations to occur: appropriate and high yielding agricultural technologies; local markets offering stable output prices that provide reasonable returns to investment in 'improved' technologies; seasonal finance for purchased inputs <sup>13</sup>; reasonably secure and equitable access to land <sup>14</sup>, with attractive returns for operators (whether tenants or land owners); and infrastructure to support input, output and financial markets. How may these conditions be developed?

As discussed earlier, these conditions may be achieved more easily where there is moderate to high population density and where irrigation allows relatively low risk, high return multiple cropping with more or less standard technologies. These conditions are not characteristic of most of today's poorer areas. However, it is clear that government policies and direct interventions played an active role in supporting these conditions even under the more favourable circumstances of successful agricultural transformation in Asia in the 1970s. These government interventions may be classified into those that are supported in current liberalisation policies (for example investment in roads and, in principle at least, in research and extension services, even if the modes of finance and delivery are different), and those that are not supported and are indeed opposed by current liberalisation policies (principally intervention in financial, input, output markets). The prevalence of the latter interventions in the green revolution processes summarised in table 2 must challenge current liberalisation policies, and begs three questions:

---

<sup>11</sup> Eicher, 1995 notes (footnote 4) that CIMMYT recognised 25 'mega environments' for maize and only 7 mega environments for wheat, the largest of which encompasses about a third of the total wheat area in developing countries.

<sup>12</sup> Egypt, Japan (1) and Vietnam are exceptions to this, but in Japan water and road communications were steadily improving at the beginning of the 20<sup>th</sup> century. Poor road infrastructure is a frequently cited constraint to development in Vietnam Barber, 1994.

<sup>13</sup> A point should be made with regard to irrigated systems, that these not only increase productivity (per crop and, through allowing multiple cropping, per year), they also tend to reduce the difficulties that farmers have in financing seasonal inputs, as they both allow easier auto-finance and are more compatible with the structure of micro-finance lending.

<sup>14</sup> Land reform may have two important roles to play in prop-poor agricultural growth, by improving the incentives for land operators to invest in improved technology, and by increasing equity and hence the elasticity of poverty reduction with respect to growth.

- What did these policies contribute to the early stages of green revolutions?
- Why have they been discredited?
- What should be the current policy response?

The second question is easiest to answer, and also throws some light on the first. Some of the reasons for the discrediting of these policies were outlined earlier. In areas where an agricultural transformation occurred, they rapidly became very heavy and unsustainable fiscal burdens and the longer they were in place and the greater the fiscal constraints, the less efficient and effective they became. In areas where there was no agricultural transformation, they delivered few benefits but still involved large running costs. In both situations they were seen to predominantly favour larger smallholder farmers. Their contribution to agricultural transformation in a brief critical period may thus be easily overlooked.

For the first question, a number of contributions may be suggested:

- increased profitability of investment in intensification for farmers;
- reduced risks for farmers;
- increased profits for private agents involved in markets, perhaps compensating for high transaction costs and risks;
- reduced transaction risks for these agents;
- the delivery of high transaction cost/risk marketing services by the state when these services would not otherwise have been delivered by private agents.

As noted above, interventions in financial, input, output markets tended to favour larger smallholder farmers. In some (generally irrigated, Asian) situations, however, these farmers were not reckoned to need this support: technologies were generally still profitable without subsidies, and increased agricultural profitability was dominated by technical rather than price changes, although seasonal finance constraints might still have limited uptake (Desai, 1988; Ranade *et al.*, 1988; Rosegrant and Siamwalla, 1988). This suggests that where very substantial improvements in yield may be achieved (a feature of many irrigated systems, but much less common in rain-fed systems) increased profitability of farmers' investments in intensification, and reduced farmer risk, may not be the major contribution of these policies. Instead, perhaps their major contribution in these more favoured areas was to deal with the high transaction cost problems inhibiting agricultural intensification by (a) easing farmers' seasonal finance constraints to increase effective demand for inputs and production <sup>15</sup>; and (b) promoting accessible markets for farm inputs and outputs.

Figure 2 shows schematically how the contributions of financial, input and output market interventions may be considered in terms of phases of development. Phase I involves

---

<sup>15</sup> Rosegrant and Siamwalla, 1988, suggest that on irrigated farms in the Philippines a subsidised credit programme had a major impact on fertiliser uptake on irrigated farms not through subsidised interest rates but through increasing the availability of finance.

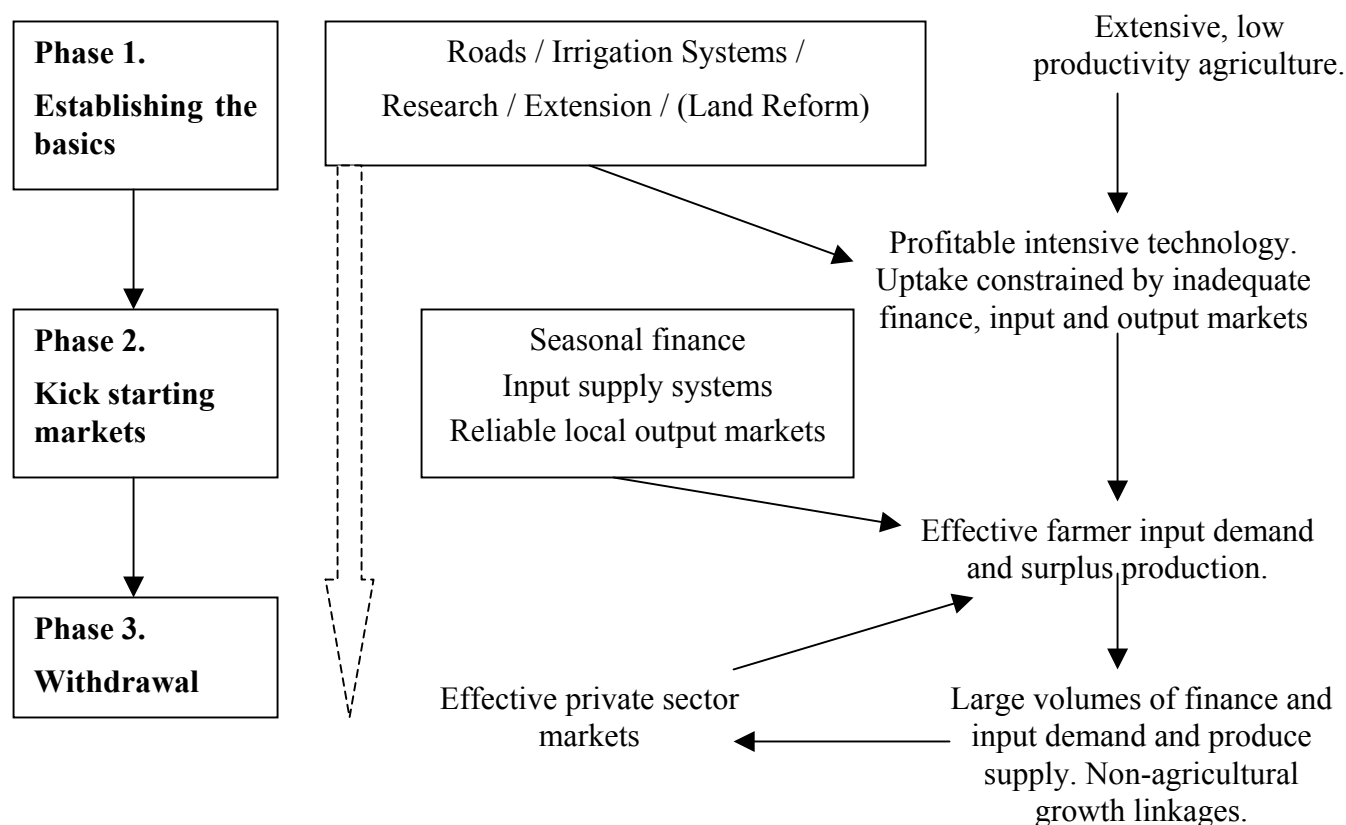


basic interventions to establish conditions for productive intensive cereal technologies. Once these are in place uptake is likely to be limited to a small number of farmers with access to seasonal finance and markets. Agricultural transformation may then be ‘kick started’ by government interventions (in phase 2) to enable farmers to access seasonal finance and seasonal input and output markets at low cost and low risk. Subsidies are required primarily to cover transaction costs, not to adjust basic prices. Once farmers have become used to the new technologies and when volumes of credit and input demand and of produce supply have built up, transaction costs per unit will fall, and will also be reduced with growing volumes of non-farm activity arising from growth linkages. Governments can then withdraw from these market activities and let the private sector take over (phase 3), transferring attention to supporting conditions that will promote development of the non-farm rural economy. Difficulties arise in managing these interventions effectively and efficiently and from political pressures to include price subsidies with transaction cost subsidies and to continue with these market interventions and subsidies when they are no longer necessary (and are indeed harmful). Furthermore the deadweight costs of such interventions will be high if they are introduced too early, or continued too long. On the other hand, since their benefits only apply during a critical but short period in the initial transformation, these benefits may easily be overlooked by analysts. This, we would suggest, is one of the causes of their neglect in current conventional policy, which attempts to move straight from phase 1 to phase 3.

The situation in many rain fed areas may be more complicated. In addition to greater challenges in developing more reliably productive technologies, there are likely to be more fundamental problems with the basic profitability of these technologies, with greater yield and price risks. There may thus be a greater need for actual price support (through input or output price subsidies) as opposed to transaction cost subsidies, and market interventions in the ‘kick start phase’ may be needed for a longer period (due to slower adoption) at greater expense (due to greater subsidy levels and higher delivery costs with lower population densities). The longer period of intervention poses further risks of more entrenched patronage and greater fiscal expenditures. Costs are therefore likely to be higher and effective implementation more difficult as compared with the experience of more favoured areas in the past. These greater costs, and the greater difficulties, pose questions about the fundamental viability of these processes, and hence of agricultural transformation as a driver of pro-poor economic growth<sup>16</sup>. However, these greater costs and difficulties need to be considered in context with the costs of other strategies for delivering pro-poor economic growth and with the costs of welfare support in the absence of such growth.

---

<sup>16</sup> These difficulties are illustrated by the problems facing agriculture as a driver of pro-poor economic growth in different parts of Zimbabwe (Poulton *et al.*, 2002): agricultural growth in the better rain fed areas (which experienced a maize revolution in the 80s) may have limited poverty reducing linkages, but other, more marginal areas (where the majority of Zimbabwe’s poor live), are unlikely to be able to support sufficiently rapid and widespread growth, particularly as rapid population threatens access to and productivity of the natural resource base on which such growth must build. Their analysis also raises important questions about the role of livestock in both supporting and competing with more intensive crop production in more marginal areas.



**Figure 2 Policy phases to support agricultural transformation in favoured areas**

## 5 Conclusions

It seems clear that in a number of respects, the challenge to agricultural led poverty reducing growth is greater in today's poor rural areas as they face the combination of increased risk and uncertainty with increased costs and/or lower returns to agricultural investment. Many of these difficulties are endogenous, the result of existing agro-ecological, locational, demographic and socio-economic conditions in these areas: that these areas have not already enjoyed a process of agricultural transformation is a direct result of these differences. It is then unfortunate that an already difficult task has been made harder by broader processes of change (for example HIV/AIDS and some aspects of globalisation and of the biotechnology revolution). However, the institutional analysis presented in this paper poses even more important questions about the effects of general policy changes. How far have policy changes of liberalisation and withdrawal of the state removed from the policy toolkit critical policy tools to address problems of high

transaction costs and risks inducing market failures? Have they indeed removed these tools from situations where, with more variability, risk and uncertainty and with lower densities of economic activity, the need for them is even greater than it was in the Asian green revolutions?

This leaves policy makers with a major challenge as external action to reduce transaction costs and raise the profitability of agricultural intensification is both more important in today's poor rural areas and more difficult and costly. Indeed, it is possible that the conditions faced in many of today's poorer areas are too difficult and challenging for agriculture to be a viable driver for pro-poor economic growth. Before such a conclusion is reached, however, it is important to either identify a viable alternative strategy for achieving such growth, or to recognise the social, economic and fiscal costs implicit in a strategy that fails to deliver growth to support the livelihoods of large numbers of poor people.

We conclude by briefly considering some of the policy options to 'get agriculture moving' in those areas where it can take off, and to get the maximum pay-off from such growth in terms of poverty reducing growth in the non-farm sector. Current policies promoting education, health, governance, communications infrastructure, and macro-economic stability all have an important part to play, and should help to provide necessary but not sufficient conditions for pro-poor agricultural growth. However, fundamental new thinking is needed to develop policies addressing the high transaction costs and low farmer and trader profits that constrain pro-poor market development. These policies must learn from both the failures and successes of past interventions, to avoid the high fiscal costs, unsustainability, inefficiency and ineffectiveness of many of the market interventionist policies and deliver reduced transaction costs and increased profitability to farmers and traders. Key elements of such policies are likely to include recognition of the problems of transaction costs and risks in inhibiting competitive private sector market activities at critical stages in agricultural transformations, rejection of simplistic presumptions that pure competition is always the most satisfactory form of market development, consideration of the direct and indirect costs of alternative policies (comparing, for example, the fiscal costs of successful agricultural development policies with the fiscal and social costs of stagnation, with safety nets and welfare interventions), imaginative and innovative learning from institutional innovations by different agents, and action research to develop and test different institutional arrangements.

## References

- Ahmed, R. (1999). Bangladesh Agriculture in the 21st Century: Assessment of Past Agricultural Policies. Washington / Dacca, World Bank.
- Barber, R. e. (1994). Agricultural policy analysis for transition to a market economy in Vietnam. Rome, FAO.
- Barrett, C. B., M. Besfuneh, et al. (2000). Heterogeneous Constraints, Incentives and Income Diversification Stragies in Rural Africa. mimeo: 40.
- Bautista, R. M. (1999). Economic Growth and Poverty Reduction in Indo China. Lessons from East Asia. Washington, IFPRI.
- Bevan, D., P. Collier, et al. (1993). Government policies and Agricultural performance : Tanzania and Kenya. In (eds) I. Goldin, Economic Reform, Trade and Agricultural Development. London, St Martins Press (OECD).
- Bhalla, G. S. and G. Singh (2001). Indian Agriculture; Four decades of development. New Delhi, Sage Publications.
- Binswanger, H. P. and J. McIntire (1987). Behavioral and Material Determinants of Production Relations in Land-abundant Tropical Agriculture. Economic Development and Cultural Change.
- Bird, K., D. Hulme, et al. (2001). Chronic poverty and remote rural areas. DSA Conference 'Different Poverties, Different Policies, Manchester.
- Boserup, E. (1965). Conditions of Agricultural growth. Chicago, Aldine.
- Bryceson, D. (1999). Sub Saharan Africa Betwixt and Between. Working Papers. Leiden, African Studies Centre, University of Leiden, Netherlands. <http://asc.leidenuniv.nl>.
- Carr, S. J. (1997). A green revolution frustrated: lessons from the Malawi experience. African Crop Science Journal **5**(1): 93-98.
- Coase, R. H. (1992). The institutional structure of production. American Economic Review **82**(4): 713-719.
- Datt, G. and M. Ravallion (1996). How important to India's poor is the sectoral composition of economic growth? The World Bank Economic Review **10**(1): 1-25.
- Davis, L. E. and D. C. North (1971). Institutional Change and American Economic Growth. Cambridge., Cambridge University Press.
- Delgado, L. C., J. Hopkins, et al. (1998). Agricultural Growth Linkages in Sub-Saharan Africa. IFPRI Research Report. Washington DC., International Food Policy Research Institute.
- Desai, G. M. (1988). Policy for rapid growth in use of modern agricultural inputs. In (eds) J. W. Mellor and R. Ahmed, Agricultural Price Policy for Developing Countries. Baltimore, The Johns Hopkins University press.

- Dong, H. K. (1987). Optimizing the role of government in modernising agriculture: the Korean experience. In (eds) J. W. Longworth, China's Rural Development Miracle. Beijing, University of Queensland Press.
- Dorward, A. (1999). A Risk Programming Approach for Analysing Contractual Choice in the Presence of Transaction Costs. European Review of Agricultural Economics **26**: 479-492.
- Dorward, A., J. Kydd, et al., Eds. (1998). Smallholder Cash Crop Production under Market Liberalisation: A New Institutional Economics Perspective. Wallingford., CAB International.
- Dorward, A. and J. Morrison (2000). The Agricultural Development Experience of the Past 30 years: lessons for LDCs, Imperial College at Wye for FAO.
- Dorward, A., S. Moyo, et al. (2001). Seasonal finance for staple crop production: problems and potential for rural livelihoods in sub Saharan Africa. Working paper, DFID Policy Research Programme project 'Diverse income sources and seasonal finance for smallholder agriculture: applying a livelihoods approach in South Africa'. Wye, Imperial College.
- Doyen, J. H. (1993). Transport in support of agriculture in Sub-Saharan Africa. In (eds) W. E. Swegle, Developing African Agriculture: New Initiatives for institutional cooperation. Proceedings of a workshop in Benin. Cotonou.
- Eicher, C. K. (1995). Zimbabwe's maize based green revolution: preconditions for replication. World Development **23**(5): 805-818.
- Eicher, C. K. and B. Kupfuma (1998). Zimbabwe's maize revolution: insights for closing Africa's food gap. In (eds) C. K. Eicher and J. Staatz, International Agricultural Development. Baltimore and London, John Hopkins University Press: 550-570.
- Eicher, C. K. and J. Staatz (1998). International Agricultural Development. Baltimore, The John Hopkins University Press.
- Fafchamps, M., F. Teal, et al. (2001). Towards a Growth Strategy for Africa. Oxford, Centre for Study of African Economies.
- FAO (2000). FAOSTAT Statistics Database, FAO (Food and Agriculture Organisation). [www.fao.org](http://www.fao.org).
- Farrington, J. and J. Lomax (2000). Trends in donor policy towards rural development : Emerging Issues in Rural Development. London, ODI.
- Francks, P. (1984). Technology and Agricultural Development in Pre-war Japan. New haven, Yale University Press.
- Gabre-Madhan, E. Z. and S. Haggblade (2001). Successes in African Agriculture: Results of an Expert Survey. Washington, IFPRI.
- Gabre-Madhin, E. Z. and B. F. Johnson (1999). Accelerating Africa's Structural Transformation. Lessons from East Asia. Washington, IFPRI.

- Goldman, A. and J. Smith (1995). Agricultural Transformations in India and Northern Nigeria - Exploring the Nature of Green Revolutions. World Development **23**(2): 243-263.
- Gonzales, L. A., F. Kasryno, et al. (1993). Economic Incentives and Comparative Advantage in Indonesia Food Crop Production. Washington, IFPRI.
- Gordon, A. and A. Goodland (2000). Production credit for African small-holders-conditions for private provision. Savings and development **XXIV**(1): 55-84.
- Hanmer, L., J. Healey, et al. (2000). Will Growth Halve Global Poverty by 2015? London, ODI.
- Hanmer, L. and Nashchold (2000). Attaining the International Development Targets: Will Growth be Enough? ODI Working Paper.
- Hine, J. (1993). Transport and marketing priorities to improve food security in Ghana and the rest of Africa. In (eds) H.-U. Thimm, Regional food security and rural infrastructure- Linkages ,shortcomings, needs: International Symposium on Regional Food security and rural infrastructure. Giessen. **1**.
- Hine, J. L., J. H. Ebdon, et al. (1997). A Comparison of Freight Transport Operations in Tanzania and Indonesia, Transport Research Laboratory.
- Howard, J. A., V. Kelly, et al. (1999). Green Revolution Technology Takes Root in Africa, Michigan State University Department of Agricultural Economics.
- IFAD (2001). Rural Poverty Report 2001: The Challenge of Ending Rural Poverty. Rome, IFAD.
- Irz, X. and T. Roe (2000). Can the world feed itself? Some insights from growth theory. Agrekon **39**(4).
- Jayne, T. S., J. Govereh, et al. (2001). False Promise of False Premise? The experience of food and input market reform in Eastern and Southern Africa. EAAE Seminar on Livelihoods and Rural Poverty: Technology, Policy and Institutions, Imperial College at Wye.
- Jayne, T. S. and S. Jones (1997). Food marketing and pricing policy in Eastern and Southern Africa: A survey. World Development **25**(9): 1505-1527.
- Johnston, B. F. and J. W. Mellor (1961). The role of agriculture in economic development. The American Economic Review **51**(4): 566-593.
- Kanwar, S. (2000). Does the dog wag the tail or the tail the dog? Cointegration of Indian agriculture with non agriculture. Journal of Policy modelling **22**(5): 533-556.
- Kaplinsky, R. (2000). Globalisation and unequalisation: What can be learned from value chain analysis? Journal of Development Studies **37**(2): 117-146.
- Kherallah, M., C. Delgado , et al. (2000a). The Road Half-travelled: Agricultural Market Reform in Sub-Saharan Africa. Food Policy Report. Washington D C, International Food Policy Research Institute.

- Kherallah, M., H. Lofgren, et al. (2000b). Wheat Policy Reform in Egypt: Adjustment of Local Markets and Options for the Future. Washington, IFPRI.
- Kogel, T. and A. Furnkranz-Prskawetz (2000). Agricultural productivity growth and escape from the Malthusian trap, CEPR.
- Kydd, J. and A. Dorward (2001). The New Washington Consensus on Poor Country Agriculture: Analysis, Prescription and Gaps: with particular attention to globalisation and finance for seasonal inputs. Development Policy Review **19**(4).
- Kydd, J., J. Haddock, et al. (2000). Genetically Modified Organisms: Issues for DFID's Research Programmes. Symposium on Genetically-Modified Organisms and Smallholders in the Developing World, Agricultural Economics Society Annual Conference,, Manchester 15 April 1999.
- Kydd, J. G., A. R. Dorward, et al. (2001a). The Role of Agriculture in Pro Poor Economic Growth in Sub Saharan Africa. London, Imperial College. <http://www.wye.ac.uk/AgEcon/ADU/research/projects/aggrowth/africagrfinbib.pdf>.
- Kydd, J. G., A. R. Dorward, et al. (2001b). New institutional economics, agricultural parastatals and marketing policy. In (eds) D. Byerlee and I. Livingstone, Renewing Development in Sub-Saharan Africa: Policy, Performance and Prospects, Routledge.
- Kydd, J. G. and C. Poulton (2000). Agricultural liberalisation, commercialisation and the market access problem. Part II of Killick, Kydd and Poulton, The Rural Poor and the Wider Economy: the Problem of Market Access, background paper for IFAD Rural Poverty 2000 report, Rome.
- Lin, J. Y. (1997). Institutional reforms and dynamics of agricultural growth in China. Food Policy **22**(3): 201-212.
- Lipton, M. (2001). The changing face of rural poverty, international development assistance and IFAD's role: the issues. In *IFAD's Rural Poverty Report 2000/2001*. Rome, IFAD.
- Longworth, J. W. (1987). China's Rural Development Miracle; with International Comparisons, University of Queensland Press.
- Mahmud, W. (1999). Bangladesh Agriculture in the 21st Century: Agricultural Development Strategy. Washington / Dacca, World Bank.
- Matsuyama, K. (1992). Agricultural productivity, comparative advantage, and economic growth. Journal of Economic Theory **58**: 17-34.
- Mellor, J. W. (2000). Faster More Equitable Growth: The Relation Between Growth in Agriculture and Poverty Reduction, Harvard University CAER.
- Mosley, P. (1993). Policy and capital market constraints to the African green revolution: a study of maize and sorghum yields in Kenya, Malawi and Zimbabwe, 1960-1991. Discussion Paper in Development Economics **6**. Reading, Department of Economics, University of Reading.

- Mosley, P. and G. Coetzee (2001). Origins and achievements of a 'smallholder big push' policy: Zimbabwe and South Africa since 1980. ESRC Development Economics Study Group, University of Nottingham.
- North, D. C. (1990). Institutions, Institutional Change and Economic Performance. Cambridge, Cambridge University Press.
- Pingali, P. (2001). The Changing Locus of Agricultural Research: How will the poor fare? 74th EAAE Seminar, Livelihoods and Rural Poverty: Technology, Policy and Institutions,, Imperial College at Wye, UK.
- Pingali, P., Y. Bigot, et al. (1987). Agricultural Mechanisation and the Evolution of Farming Systems in Sub-Saharan Africa, World Bank / John Hopkins Press.
- Pinstrup-Andersen, P., R. Pandya-Lorch, et al. (2001). Global Food Security: A Review of the Challenges: 2020 Vision. Washington, IFPRI.
- Platteau, J.-P. (1996). Physical infrastructure as a constraint on agricultural growth: the case of sub-Saharan Africa. Oxford Development Studies **24**: 189-222.
- Poulton, C., R. Davies, et al. (2002). A review of Zimbabwe's agricultural economic policies: 1980 - 2000. Working paper, Institutions and Economic Policies for Pro-Poor Agricultural Growth. London, Imperial College.
- Poulton, C., A. Dorward, et al. (1998). A New Institutional Perspective on Current Policy Debates. In (eds) A. Dorward, J. Kydd and C. Poulton, Smallholder Cash Crop Production under Market Liberalisation: A New Institutional Economics Perspective. Wallingford, CAB International: 1-55.
- Ranade, C. G., D. Jha, et al. (1988). Technical change, production costs, and supply response. In (eds) J. W. Mellor and R. Ahmed, Agricultural Price Policy for Developing Countries. Baltimore, The Johns Hopkins University Press.
- Rangarajan, C. (1982). Agricultural Growth and Industrial Performance in India. Washington, IFPRI.
- Ravallion, M. and G. Datt (1999). When is growth pro-poor? Evidence from the diverse experience of India's states. World Bank Policy Research Working Paper Series **2263**.
- Reardon, T. (1998). Rural non-farm income in developing countries. In (eds) FAO, The State of Food and Agriculture 1998. Rome, Food and Agriculture Organisation.
- Reardon, T., J. E. Taylor, et al. (2000). Effects of non-farm employment on rural income inequality in developing countries: an investment perspective. Journal of Agricultural Economics **51**(2): 266-288.
- Riverson, J. D. N., J. Gaviria, et al. (1991). Rural Roads in Sub-Saharan Africa: Lessons from World Bank experience. Washington, World Bank.
- Rosegrant, M. W. and P. B. R. Hazell (2000). Transforming the Rural Asian Economy: The Unfinished Revolution. Hong Kong, Oxford University Press (China).



- Rosegrant, M. W. and A. Siamwalla (1988). Government credit programmes: Justification, benefits and costs. In (eds) J. W. Mellor and R. Ahmed, Agricultural Price Policy for Developing Countries. Baltimore, The Johns Hopkins University press.
- Ruthenberg, H. (1980). Farming Systems in the Tropics (3rd edition). Oxford, Clarendon Press.
- Salleh, I. M. and S. D. Meyanathan (1993). The Lessons of East Asia: Malaysia, Growth, Equity and Structural transformation. Washington, World Bank.
- Sanderson, S. E. (1986). The Transformation of Mexican Agriculture. International Structure and the politics of rural change., Princeton University press.
- Smith, L. and L. Haddad (2000). Overcoming Child Malnutrition in developing countries: Past achievements and future choices. Washington, IFPRI.
- Smith, L. and I. Urey (2002). Institutions and economic policies for pro-poor agricultural growth: India literature review. Working paper, Institutions and Economic Policies for Pro-Poor Agricultural Growth. London, Imperial College.
- Stern, N. (1996). Growth Theories, old and new and the role of agriculture in economic development. Rome, FAO.
- Thirtle, C., X. Irz, et al. (2001). Relationship between changes in agricultural productivity and the incidence of poverty in developing countries. Paper prepared for DFID. London, Imperial College.
- Tiffen, M. and M. Mortimore (1994). Malthus controverted: the role of capital and technology in growth and environmental recovery in Kenya. World Development **22**(7): 997-1010.
- Timmer, C. P. (1997). How well do the poor connect to the growth process?, Harvard University, Consulting assistance on economic reform II.
- Tomich, P. T., P. Kilby, et al. (1995). Transforming Agrarian Economies: opportunities seized, opportunities missed. Ithaca, Cornell University Press.
- Turner, B. L. I., G. Hyden, et al., Eds. (1993). Population growth and agricultural change in Africa. Gainesville., Univ Press of Florida.
- UNHCR (2000). Refugees and others of concern to UNHCR: Statistical Overview (2000 edition). Geneva, UNHCR.
- USDA (1968). Taiwan's agricultural development: its relevance for developing countries today. Washington DC, USDA Economic Research Service.
- Wichmann, T. (1997). Agricultural technological progress and the development of the dual economy. Heidelberg, Physica-Verlag.
- Wiggins, S. (2000). Interpreting changes from the 1970s to the 1990s in African agriculture through village studies. World Development **28**(4): 631-662.
- Wiggins, S. (2001). Spatial dimensions of rural development. Department of Agricultural and Food Economics, University of Reading.

- Williamson, O. E. (1985). The Economic Institutions of Capitalism. New York, The Free Press.
- World Bank (1993). Arab Republic of Egypt: An agricultural strategy for the 1990's. Washington, World Bank.
- World Bank (1994). World Development Report. Washington DC, World Bank.
- World Bank (2000a). Can Africa Claim the 21st Century?, World Bank, African Development Bank, United Nations Economic Commission for Africa.
- World Bank (2000b). World Development Indicators, World Bank.
- Yamada, S. and Y. Hayami (1979). Agricultural growth in Japan, 1880-1970. In (eds) Y. Hayami, V. Ruttan and H. Southworth, Agricultural Growth in Japan, Taiwan, Korea and the Philippines. Honolulu, University Press of Hawaii: 33-58.