

MSSD DISCUSSION PAPER NO. 50

**GLOBALIZATION AND THE SMALLHOLDERS:
A REVIEW OF ISSUES, APPROACHES, AND
IMPLICATIONS**

Sudha Narayanan and Ashok Gulati

Markets and Structural Studies Division

International Food Policy Research Institute

2033 K Street, N.W.

Washington, D.C. 20006 U.S.A.

<http://www.ifpri.org>

and

Rural Development Department

The World Bank

1818 H Street N.W.

Washington, DC 20043

November 2002

MSSD Discussion Papers contain preliminary material and research results, and are circulated prior to a full peer review in order to stimulate discussion and critical comment. It is expected that most Discussion Papers will eventually be published in some other form, and that their content may also be revised. This paper is available at <http://www.cgiar.org/ifpri/divs/mssd/dp.htm>

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EXECUTIVE SUMMARY

A major question that has surfaced in the changing context of world agriculture is whether the smallholders would ride the wave of globalization or be swept away. This paper addresses the debate with a four-fold objective: (1) it maps different factors that are likely to impinge on developing country smallholders as a result of globalization in general and of agriculture in particular (2) it briefly reviews literature and summarizes different approaches and methodology used to study this question (3) it identifies areas which have been the focus of attention so far and those that are relatively under-researched (4) it attempts to draw some conclusions regarding the impact of globalization on the smallholders from the literature review, and then suggests some policy implications if globalization is to benefit the smallholders.

Trade liberalization is undoubtedly a major driver of globalization, and it is therefore pertinent to find out how it affects the smallholders in the developing world. Trade liberalization may be in response to the commitments under the Agreement on Agriculture (AOA) of the World Trade Organization (WTO) or unilaterally as a deliberate strategy to achieve higher growth rates and/or efficient use of resources. But there are at least two other agreements under the WTO, the one on Intellectual Property Rights (IPRs) and the other on Sanitary and Phyto-Sanitary (SPS) standards, which are also likely to have significant implications for the smallholders of developing world. Besides, there are some other powerful global drivers and meta trends, such as increasing scale and concentration of agri-business, foreign direct investments in agro-processing and retail distribution, increasing incomes and urbanization leading to shift in

consumption patterns in favor of high value agri-products, which affect the smallholders. What is the experience so far in the developing world with respect to these global changes in terms of their impact on smallholders? Can one learn some lessons from the research done so far, and ensure that globalization benefits the smallholders? This study is an attempt in that direction.

Observations on Approaches and Methodology

The paper finds that studies that focus on trade liberalization alone (operating through price changes) and those that address broader issues of globalization (such as changing structure of food industry and new relationships in the interface of farm and firm, SPS issues, etc.) have run somewhat parallel to each other where a greater integration of the two would be more valuable.

Methodological approaches may have something to do with this apparent dichotomy. Modeling, used so commonly in trade liberalization studies, has limited scope in capturing structural changes that typify broader issues of globalization. Qualitative approaches although useful to focus on particular aspects, fail to capture the net impact of different changes in a rigorous way. It seems that the data based approach (or survey based approach), in conjunction with qualitative studies, offer best scope to assess the predicate of the smallholder.

Importantly, barring a few areas such as short-term impact of price change, institutional and structural constraints, contractual relationships between farm and firm, the paper finds that the smallholder question has not attracted the attention it deserves.

Who are the Winners? Who are the Losers?

An important part of this study is to find out from the existing literature whether smallholders have benefited or adversely affected by from the globalization process. Broadly it emerges that while some smallholders have succeeded in riding the wave of globalization, others have not yet been able to exploit opportunities opened up by globalization to the extent possible. Noteworthy is that there is no unequivocal evidence that smallholders in one region may have had greater relative success in riding the globalization wave than have those in others. Even while acknowledging the significant differences within regions themselves, it is evident that whether smallholders have benefited or have been hurt is determined by a fairly narrow range of issues – vertical coordination with processors or exporters, access to infrastructure and finance (credit), role of public sector and international involvement in capacity building, alternatives available in non-farm sector, etc. The search is then for policies that can successfully address these issues.

What are the Policy Implications?

Based on this, the paper concludes that policy interventions vis-à-vis smallholders should essentially have a twin focus (1) removing the shackles that are currently constraining smallholders from exploiting opportunities that globalization presents and (2) ensuring minimum adverse impact, both being two sides of the same coin. While the former can be accomplished through *enabling policies*, the latter would have to be tackled through *coping policies*.

Particular areas identified as critical *enabling factors* are greater vertical coordination, removing credit constraints, reducing transactions costs, building social capital, greater role for public sector in providing infrastructure and facilitating institutions and also greater initiatives for international capacity building. On the other hand, *coping strategies* would include provision of credible safety nets and risk coping instruments, promoting exit options particularly through promotion of opportunities in the rural non-farm sector, guarding against harmful monopolistic competition, and focused research on technologies for small farmers.

Needless to say, the relative importance of these factors would vary across regions. It is thus important to identify which battery of policies is appropriate depending on the unique circumstances of each region. It is equally important to draw lessons from the several success stories to be able to replicate these successes on a larger scale in a meaningful way. Only then can small farmers make big gains from globalization.

GLOBALIZATION AND THE SMALLHOLDERS: A REVIEW OF ISSUES, APPROACHES AND TENTATIVE CONCLUSIONS

Sudha Narayanan¹ and Ashok Gulati²

1. BACKDROP

Globalization at least in its narrow economic sense implies freer movement of goods, services, capital flows and technology. The process of economic globalization has been on for a long time with industrial goods taking a lead. This process got a shot in the arm with the explicit inclusion of agriculture under the Uruguay Round Agreement on Agriculture (URAA).

The URAA, with its three “pillars” – market access, domestic support and export competition – has caused considerable concern amongst nations, both developed and developing. In the early years, the focus was mainly on whether and how much the developing countries would benefit from agricultural trade liberalization. More recently however, the focus has shifted to the question of distributional impact of liberalization within nations, notably in developing countries. One major issue that has surfaced is: how would liberalization affect smallholders in these countries? How can their interests be

¹ Senior Research Assistant, Markets and Structural Studies Division, International Food Policy Research Institute (IFPRI), 2033 K Street, NW, Washington DC, 20006. e-mail: s.narayanan@cgiar.org

² Director, Markets and Structural Studies Division, International Food Policy Research Institute (IFPRI), 2033 K Street, NW, Washington DC, 20006. e-mail: a.gulati@cgiar.org

safeguarded in the context of a globalizing agricultural sector? In short, will smallholders ride the wave of globalization or be swept away?

This paper attempts to survey recent studies that evaluate the impact of globalization on smallholders. The objective of this paper is four-fold:

- (1) to map the different factors that would impinge on smallholders in the changing context of agriculture in developing countries³;
- (2) to review literature and summarize the different approaches and methodology used to gauge the impact of globalization on the smallholders, as also identify the areas that have been under-researched;
- (3) to bring out some conclusions regarding the impact of globalization on smallholders from the literature review; and
- (4) to explore policy options that could help the smallholders ride the wave of globalization rather than be swept away by it.

The underlying motivation of the study is that while there has been much discussion on trade liberalization and poverty in general, the smallholder question has not commanded as much attention. Perhaps reflecting this, reviews of literature pertaining to trade liberalization and poverty are many (McCulloch et al. 2001, Reimer 2002, etc.), as have been those focusing on specific issues – such as linkage between trade liberalization and wages (Wood 1995, Slaughter 1999), globalization and agro-industrialization (Reardon and Barrett 2000), etc. In contrast, few have put smallholders under the

³ The question of small farms in the *developed* countries has also become an important issue in recent times (Japan, for instance). However, the problem there is so vastly different as to be uncomparable.

spotlight. This paper seeks to redress this lacuna and surveys extant literature with a different point of departure – namely smallholders.

In order to make the review more tractable and meaningful, the copious literature on poverty (extensively reviewed elsewhere) being not always pertinent to the question of the smallholder has not been dealt with in detail. However to the extent that they may offer useful methodological insights, specific studies have been included in this paper. Further, throughout the review, our attempt is to highlight analytical issues that are of relevance so that although methodological details have been discussed, these are not accorded detailed treatment. This review focuses primarily – though not exclusively – on work in the 1990s, particularly after the implementation of the Uruguay Round.

This paper is organized in 7 sections. Following this first section, Section 2 seeks to characterize the smallholders and why they deserve special attention. Section 3 then presents an overview of the debate with a discussion on different factors that operate to shape smallholders' environment. In Section 4, we outline broadly the methods that have been used to empirically estimate impact of globalization. Subsequently, in Section 5 there is a detailed review of the studies juxtaposed against the issues raised in Section 3. In Section 6, we attempt to identify areas that require more research and comment on different methodologies. We also draw on what all these studies imply in terms of the impact of globalization on the smallholders, and what policy options can help them gain more than they lose from this process and force of globalization. The concluding Section 7 wraps up the discussion.

2. WHO ARE THE SMALLHOLDERS? WHY ARE THEY IMPORTANT?

CHARACTERIZING SMALLHOLDERS

At the outset it is essential to define what the term ‘smallholder’ means; this is in itself a challenging task, as there exists no precise or universally accepted definition. The term is commonly linked to the size of the landholding or livestock owned. A smallholder would thus normally derive his/her livelihood from a holding of less than 2 to 5 ha - holdings are often less than 0.2 ha and about 10-20 heads of livestock, though it is common to have only 2 or 3.

However, when defined in this manner, a number of problematic issues arise. *First*, the very notion of “small” changes in different contexts, particularly across different crops. Thus, a small farm in the context of a plantation crop like banana or coffee would possibly be much larger than a small farm that is devoted to cultivating a staple cereal like wheat or rice. *Second*, it is often more meaningful to denote smallholder agriculture as resource poor rather than merely in terms of size⁴. A critical issue here is whether land is irrigated or unirrigated (or rainfed). A small piece of irrigated land would probably have to be matched by unirrigated (or degraded) land several times its size to be comparable in terms of productivity, other things being equal. The concept of a small farm under this circumstance becomes ambiguous. *Finally*, it is also important to

⁴ It is possible, for instance, that the urban rich possess small farms in peri-urban regions. This is obviously quite a different case but one that nevertheless fits into the definition of smallholders in terms of size.

recognize that the notion of a smallholder varies widely across different regions of the world, since they are defined primarily in relation to the average landholding size in that region. In South Asia, there are as many as 125 million holdings with avg. size of 1.6 ha. And 80% have holdings the size of a football field (0.6 ha)! In Sub-Saharan Africa, farms are relatively larger in comparison with Asia. 96% of the farmers have less than 5 hectares each and over two-thirds, less than 1 hectare (Dunstan 2001). In Latin America, small farms are even larger. It is interesting for instance that in several states in India, the land ceiling permitted by law for irrigated land is about 7 hectares – the biggest farm in this group might even be categorized as small in parts of Latin America.

Thus, rather than *defining* the term smallholder, for the purpose of this review, we *characterize* the smallholder as a farmer (crop or livestock) practicing a mix of commercial and subsistence production or either, where the family provides the majority of labour and the farm provides the principal source of income. It could happen that a considerable number of farmers who fit this description actually possess little land and only a few livestock as compared with the regional average.

SMALLHOLDERS ARE BIG DEAL

Given this characterization of smallholders, the next step is to ask: Why do smallholders matter at all and why should they merit special attention?

The fact is smallholders *are* a big deal. In South Asia alone, small farms support much of the needs of 1.3 billion people. In several countries like Bangladesh, most of the cultivated land is operated by farmers whose holdings are a mere 0.3 hectares (Gulati

2001). These are all farmers who rely primarily on family labour and few purchased inputs.

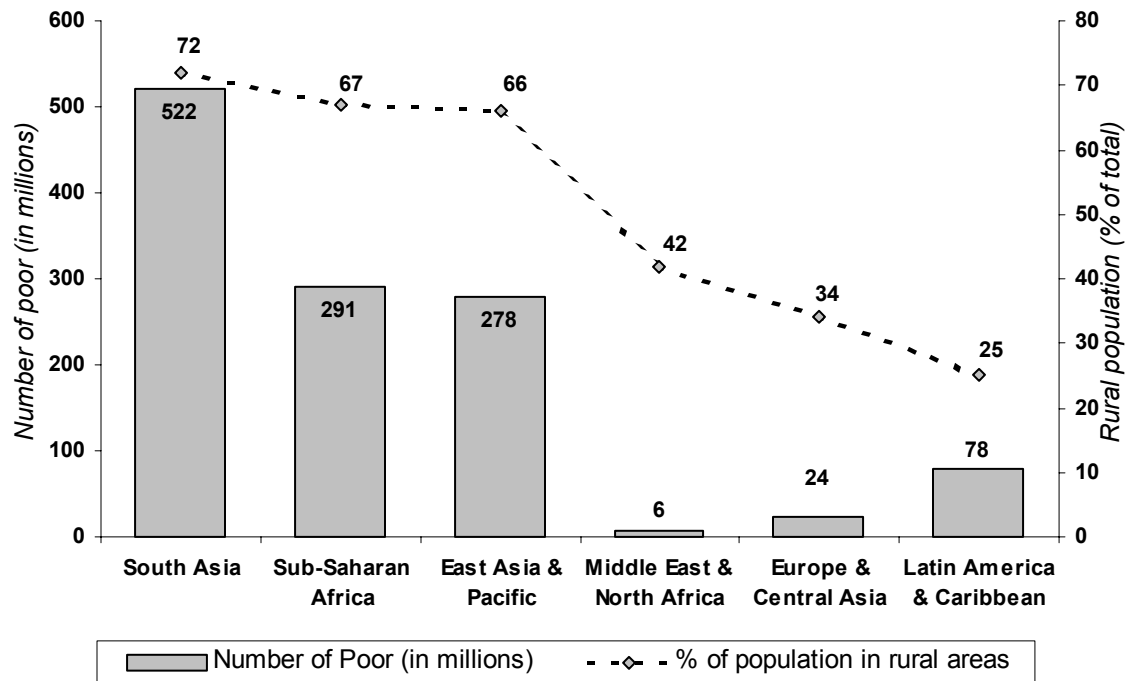
Apart from the sheer mass of livelihoods that depend on small farms, smallholders often account for a large share of agricultural production. Interestingly in Sub-Saharan Africa, they are known to account for about 90% of agricultural production (Dunstan 2001). In India, they account for an increasing proportion of the food basket and agricultural GDP – farmers with less than 2 hectares were responsible for 41% of total foodgrain production in 1990-91 as against 34% in 1980-81. It is also interesting that small and marginal farmers in India possessed the highest share of livestock – 59% of cattle, 56% of buffalo, 67% of goats and 73% of the pigs population in 1998-99 (Singh and Kumar 2002). Thus, the welfare of the smallholders has powerful implications for overall agricultural production and therefore for food security as well.

It is essential too at this stage to place smallholders in the larger context of *rural poverty* (Figure 1)⁵. It is a stylized fact that smallholders in developing countries are poor. Indeed, research suggests that almost in all the developing regions (East, South, Central and West Africa, Asia-Pacific, Latin America and the Caribbean; excepting Near East and North Africa), small farmers constitute a part of the rural poor (IFAD 2001). In fact,

⁵Of the estimated 1.2 billion people in the world, who live on less than a dollar a day, 75% of them live and work in rural areas. It is expected that even by 2025, 60% of all the poor would continue to be in rural areas. 44% of the 1.2 billion live in South Asia as against 24% each in Sub-Saharan Africa and East Asia and 6.5% in Latin America and the Caribbean. Thus, the issue of smallholders needs to be addressed in the larger context of rural poverty, particularly in Asia and Sub-Saharan Africa.

in Africa, they account for a majority of the rural poor (estimated at 73%; European Commission 2002) while in Asia they represent about 49% of the functionally poor.⁶

Figure 1—Poverty & Rural Population in Selected Regions (1998)



Source: *World Development Indicators (1998)*, Karanja (2002)

It is thus evident that smallholders *are* important – because a large number of livelihoods depend on small farms, because they constitute a large share of the rural poor and because they account for a large proportion of agricultural production. But why do smallholders merit special attention? The fact is smallholders have a set of unique

⁶ It is important to remember however that there are exceptions. For instance, small commercially oriented farms that draw on family labour growing high value crops such as cut flowers and produce for export or those growing vegetables in peri-urban areas could in fact be counted among the more prosperous farmers.

problems. On the one hand, unlike larger farmers, they are typically constrained by resources that limit their ability to take shocks or even to negotiate the new globalized context. On the other hand, unlike other groups of rural poor (agricultural labourers, landless workers, etc.), smallholders relative advantage in possessing both labour and land implies they are not only better positioned to take advantage of opportunities but also make decisions that are much more complex and wide-ranging. To some extent what happens to rural poverty depends on which way the smallholders go.

It is against this broad characterization with its many caveats, that impact of globalization on smallholders in developing countries would have to be evaluated.

3. SMALLHOLDERS IN A GLOBALIZING WORLD

KEY QUESTIONS

Globalization opens up opportunities for smallholders but also poses some threats. The key questions as far as smallholders are concerned are: What are these opportunities? Can smallholders exploit these? And what are the threats? Can smallholders survive these threats? In particular, there is some concern regarding smallholders exiting agriculture. While, one would expect this to happen in the normal course of development, in the context of globalization and the often cataclysmic changes it entails, it is important to ask why they do so. Do *pull* factors represented by opportunities in the non-farm sector, notably industry and services attract them away from farming? Or are they forced to quit farming in the face of adverse circumstances (i.e. because of *push* factors) as a result of

trade liberalization? Naturally, these are two very different things; the latter in particular should be of grave concern to policymakers.

Going a step further, what implications does this have for policy? Should there be an effort to keep the smallholders on their farms, or should they be encouraged to quit farming? If it is the latter, what are the exit options that can be made available to the smallholder and how can the transition be made smooth? If not, what are the mechanisms that can be devised to protect smallholders who are particularly vulnerable to the effects of globalization? It is important too in this context to determine if these policy levers should merely ensure that small farmers are not disfavoured (*vis-à-vis* large farmers) or if they should be explicitly supported through special benefits. This is especially critical for regions where smallholders form the backbone of agriculture, and are instrumental in driving growth in the agricultural sector. A broader question relates to how the current political disempowerment of smallholders can be redressed so that they count in decision-making process in developing countries.

Before these questions can be answered, the essential first step is to see in what ways globalization would affect and has so far impacted on smallholders across the world.

THE DEBATE

The debate as to how the smallholder would fare in a liberalized agricultural context follows basically two strands. On the one hand, there are those who believe that if prices increase in response to liberalization, it would impact favorably on small farmers

since they would benefit from higher producer prices and incomes. On the other hand, there are those who claim that since the rural poor are often net-consumers of food, adjustment programmes that increase the prices of tradable commodities (food) would squeeze real incomes of small farmers who are net-buyers. Still others acknowledge that the impact of adjustment or liberalization cannot be determined by looking merely at the consumption bundle or their relative prices in isolation. One would also have to see how price changes affect their production basket. The story gets complicated further when one takes into account the issue of second round effects on wage rates given that many smallholders work on others' fields. It is thus the net impact on production, consumption and wage income of smallholders that would perhaps shed some light on how they are indeed affected.

Based on these viewpoints, there have been different assessments of the predicate of the smallholder in a globalized setting. While some assert that liberalization has forced the small farmer to “retreat into subsistence” in response to its adverse impact, others are optimistic that increasing trade, particularly in high-value commodities, offers an opportunity for the small farmer to ride the globalization wave.

ISSUES

In reality, the process of globalization can impact small farmers in complex ways – both directly and indirectly. Globalization is a multi-dimensional phenomenon – ranging from trade liberalization to cultural and political change. From the point of view of smallholder however, the elements of globalization that are likely to have strong

repercussions, and therefore of relevance to this study, can be organized into two broad categories (Table 1; see Reardon and Barrett 2000):

Global Drivers: These refer to factors that have been the driving forces of globalization, like multilateral trading agreements, etc. These have precipitated fundamental and large-scale changes in policy orientation of hitherto closed economies;

Meta-Trends: These are changes taking place all over the world, independently of the globalization process yet, shaping the very nature of globalization. These include trends in technology, consumption patterns, structure of agri-business, etc, that occur both globally and also as more localized shifts.

Table 1—Global Drivers and Meta-Trends

Global Drivers	Meta-Trends
<i>What drives Globalization?</i>	<i>Global and Local Trends independent of globalization</i>
<ul style="list-style-type: none"> ● Trade Liberalization ● Intellectual Property Rights ● Food Safety & Quality Standards ● Foreign Direct Investment ● Scale of Agro-industry 	<ul style="list-style-type: none"> ● Technological Change ● Urbanization, Increasing Incomes, Population Pressure ● Shifts in Food Consumption Patterns ● Environmental Degradation

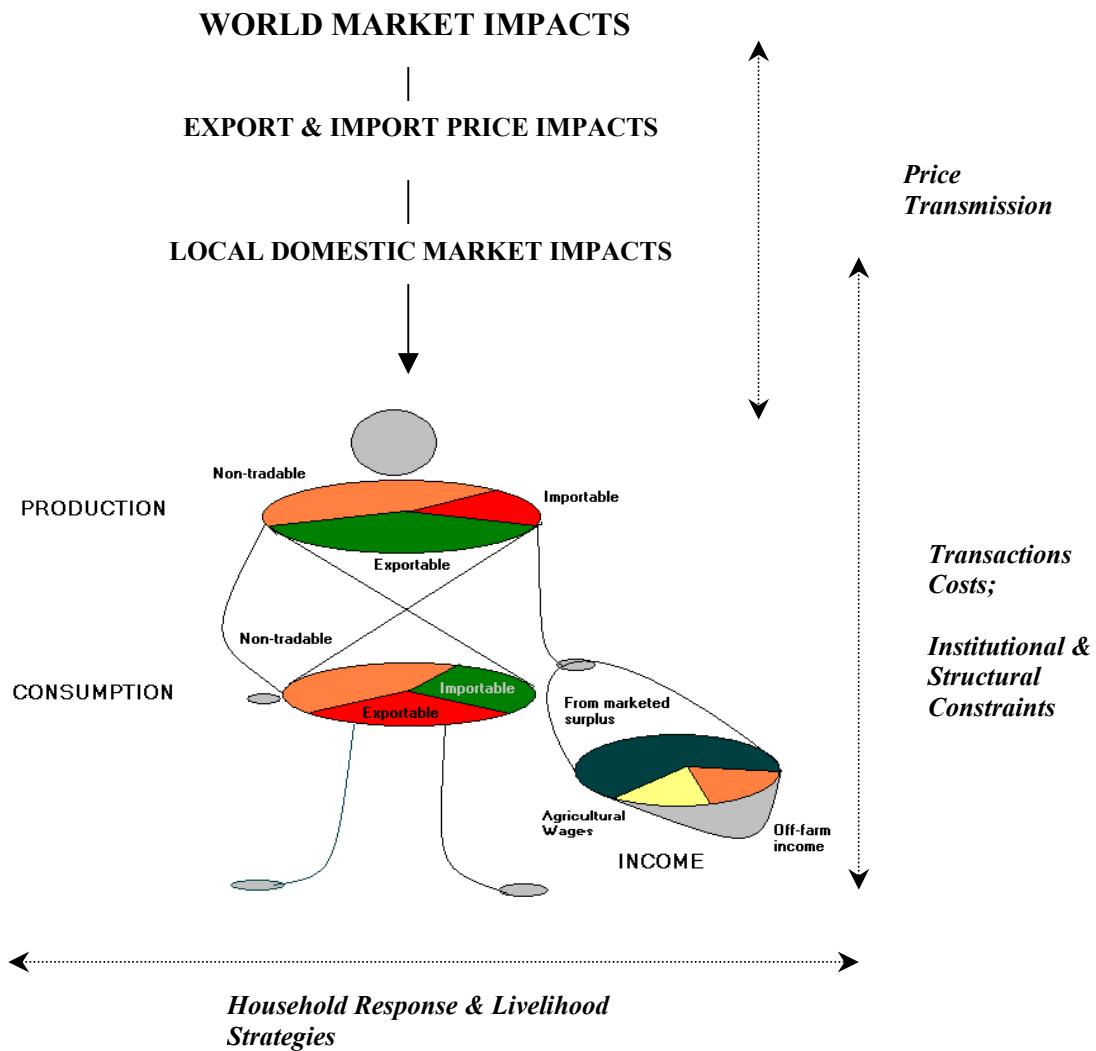
Global Drivers

Of all global drivers, **trade liberalization** is the most important. The direct impact of trade liberalization is usually through *change in prices* of commodities that have been liberalized – or the *impact effect*. However, it also triggers a whole range of

second-round effects through factor prices, income, investment, employment and demand linkages.

In the short run, for smallholders producing primarily the importable commodity, their real income change following a price decline of the importable depends on consumption profile – in an extreme case, where they consume only importables it is constant since the effects of price change as consumer and producer counterbalance each other. On the other hand, it falls if they consume some exportables or non-tradables. Conversely, if the household produces primarily exportables then they stand to gain from the price decline for importables, unless they consume only the exportables, in which case their welfare remains unchanged. For those who produce non-tradables alone, the net welfare change depends on the consumption mix (Ingco 2001; Hoekman et al 2001). Things could get even more complicated if there were simultaneous liberalization of exportables and importables (Figure 2).

Figure 2—Trade Liberalization: Who is Affected? And How?



The effects described above pertain only to the immediate or short-term impact and this needs to be qualified in some important ways. The fact is there are several other aspects that need to be considered while establishing any link between price changes and welfare effects. These are:

- whether *price transmission* actually occurs – this depends on the mechanism and structure of the distribution sector, government role in marketing and distribution, costs and constraints of marketing, infrastructure, domestic taxes and regulation, and markets for inputs, etc.
- the *small farmer household's response* to price signals in terms of substitution between commodities in the consumption and production bundle, marketed surplus and labour allocation decisions. These may differ widely depending on the individual circumstance of the household. Among the factors that determine this is access to public services and goods, its demographic profile (labour endowments), access to inputs, credit etc. These could be classified as *institutional and structural constraints*.
- there are also significant *second-round effects* in operation that come from linkages with other non-farm activities within and outside the rural economy. The ways in which second round effects operate are difficult to gauge, primarily because it depends on opportunities available and performance in the non-farm sector.
- In the long run, there may be less obvious impacts operating through *government transfers* influenced by changes in revenue from trade taxes, *incentives* for investment and innovations, *terms of trade changes* etc. (Winters 2000 & Bannister and Thugge 2001, cited in Reimer 2001).

Apart from **trade liberalization**, other global drivers too have important implications for small farmers. The establishment of **Intellectual Property Rights** under the TRIPS Agreement could affect smallholders' access to new technologies or they may face higher prices for critical inputs resulting from more oligopolistic /monopolistic seed

industry structures. A similar challenge is posed by the increasingly stringent **food safety and quality standards (SPS measures)** in developed countries, or similar trends even domestically, which might impinge on smallholders' ability to exploit opportunities for high-value exports to these countries. Also, the **liberalization of capital flows** is leading to increase in cross-country investment in agri-food industries, leading to, in part, **larger scale of operations** and **growing concentration** in the agri-food chain (inputs, processing, retailing, trading etc.).

Meta Trends

All these global drivers in fact foreground certain basic, perceptible global (and local) shifts, which might be called *meta-trends* (Reardon and Barrett 2000). These have emerged independently rather than in response to specific global drivers, but significantly shape the globalization process itself and hence the environment of smallholders. Among these, are general factors like urbanization, population pressure, demand shifts etc. all of which would impinge on the small farmer. **Population pressure** in developing countries, particularly in rural areas affect landholding patterns; consequently, smallholders could proliferate and their farms could get even smaller. **Urbanization** and **rising incomes** have led to shifts in demand away from unprocessed staples to more processed foods (Bennett's Law) opening up some areas of opportunity for small farmers. Another important trend is the rapid **technological changes** that are dramatically affecting agro-industries and increasingly the distribution channels from farm to table (information technology, packaging, storing, transport, etc.). Depending on the extent to which these

technologies have scale-bias, they would impact smallholders' environment significantly. Other factors include **environmental degradation**, particularly in resource poor regions, gradual shift in **political economy** towards neo-liberal regimes that reinforce trends in globalization and greater cross-country integration.

It is thus easy to see that the question of smallholders in a globalizing world is in reality an extremely complex issue; for the same reason it is difficult to anticipate how the smallholder would fare without in-depth research into all these aspects. Any study that attempts to do so would have to try and incorporate as many of these factors as possible. Against this broad framework for analysis, it would now be interesting to see how existing studies have approached this issue.

4. OVERVIEW OF APPROACHES

An extensive survey of literature shows that three broad approaches have been used to study the impact of agricultural trade liberalization (and more generally globalization) on small farmers. There is however considerable diversity in emphasis and methodology even within these categories. They can be described broadly as (1) descriptive (qualitative) approach (2) data based or survey method and (3) modeling approach, although there are some studies that have attempted to combine different approaches in addressing the issue. These three methods have been recognized as those commonly used in poverty and trade liberalization studies (McCulloch et al 2001).

Descriptive studies give an account of trade policy reforms and the manner in which it affects rural population, in this case the smallholder. There is a large body of

work of this kind ranging from the anecdotal (Anderson 2000) to the more rigorous (Nadal 2000). Typically, studies that are qualitative describe the changes in policy scenario and try to evaluate its impact by comparing the changed circumstance of the smallholder before and after the policy change in question.

The **data based approach** as the name suggests base their study on data, which may be secondary data or primary surveys. Usually some hypothesis with respect to the link between liberalization (typically represented as change in prices) and incomes of farmers is tested and often complemented with descriptive statistics.

The third approach is **modeling**. This has become increasingly popular in recent times and often attains a high degree of complexity and sophistication. The modeling approach entails construction of a theoretical framework that captures linkages between trade liberalization and the smallholder – more generally to reflect the conditions of the economy. Its empirical basis derives from the parameters used in the model, which are often obtained from analysis of actual data. This umbrella category encompasses models that vary across several dimensions. For instance, models can be applied to study effects at the household level (say in terms of labour allocation, consumption, nutrition etc.), at the national level (aggregate household welfare, and to address questions of income distribution) or at the global level (to see aggregate welfare at country level or country groups). Models can be static or dynamic, and in its coverage of sectors, partial or general equilibrium. Briefly, partial equilibrium models analyze a particular sector of the economy separately ignoring any likely inter-sector repercussions. However, within the sector they could be multi-market models that incorporate several markets. General

equilibrium models, in contrast, try to incorporate the effects of changes in prices, output, employment etc. across sectors and would typically represent the entire economy. Even within each of these, there may be important differences in the methodology.

The first two approaches – descriptive and data-based or survey methods – can be thought of as *bottom-up approaches*, which focus on micro-level details and draw on these to make broader conclusions (Reimer 2002). Modeling, in contrast, particularly those of the general equilibrium kind, is typically a *top-down approach*. Drawing on a macro-level algebraic framework of the economy, an attempt is made to capture impact of exogenous shocks to the system on different agents (usually a representative agent). Recent innovations have attempted to marry the two approaches in what is termed a micro-macro synthesis. Given the tremendous diversity in approaches it is natural that they address issues and make assumptions that are equally diverse.

For the purpose of this review, however, to keep the issues in focus, different works reviewed below are organized on the basis of the issues covered rather than the approaches used, juxtaposing these studies against the issues outlined above.

5. A REVIEW OF SELECTED LITERATURE

So far, studies that evaluate the implications of liberalization on *poverty* in general far outnumber those that focus exclusively on the predicate of the *smallholder*. However to the extent that smallholders constitute a substantial part of the rural poor, these studies, may be of relevance to the question at hand.

TRADE LIBERALIZATION

The issue that has been addressed most often is the impact on the smallholder of **trade liberalization** and concomitant *price changes and related second-round effects*. Indeed, this is the most visible aspect of globalization. The methods that have been applied vary widely from anecdotal documentation to elaborate modeling structures (Annexe Table 1).

Assessing impact effect

In assessing impact effects, studies have generally been concerned with two sets of issues: *relative price changes* with trade liberalization and *price volatility*.

a. Relative Price Changes

The impact effect is the immediate short-term consequence of *relative price changes* at the border consequent to export liberalization (removal of a quota), import liberalization (reducing tariffs, freeing up imports) or still others such as currency devaluation, etc. Two main arguments emerge from studies:

- *If domestic prices are less than export parity prices*, liberalization has the effect to pushing up domestic prices. When food prices increase it has adverse effect on rural poverty as in India and Philippines (A.R.Khan cited in McKay, Winters and Kedir, 2000). Many studies contend that since smallholders are typically net-buyers of food, and liberalization is inimical to smallholders.
- On the other hand, *if domestic price levels remain higher than import parity prices*, liberalization would lead to domestic prices declining to world levels. In this case,

liberalization leads to cheap imports, which, studies claim, destroys livelihoods of small farmers (Watkins 1997 for corn in the Philippines, Nadal 2000a & b for Mexico, Rojjanapo for Thailand, etc.)

That these effects are sector-specific is emphasized by Ahmad and Tawang. Ahmad and Tawang in their econometric analysis of Malaysia's palm oil and paddy sectors. Whereas smallholder palm producers are likely to benefit, rice farmers could see farm incomes decline by 15 to 60%.

Assessing impact effect of liberalization and consequent change in prices requires however that both the *consumption* and *production* of the commodity in question be considered. This is because it is usually the case that even among a certain group such as the smallholders, there may be gainers and losers depending on the individual household's status either as a *net-seller* or *net-buyer*. Most qualitative studies do not take this into account in a rigorous manner. The databased studies that do, come up with different prognoses for different countries. For instance, while welfare impacts are positive for rice price increases in Thailand and Indonesia (Deaton 1989, Budd 1993), they are negative in Madagascar (Barrett & Dorosh 1996).

It is clear from this set of studies that accounting for marketed surplus is important. Even so, many of these studies typically focus on a *single commodity sector*, which is restrictive. In reality, there is a whole range of goods, exportables, importables, non-tradables, both agricultural and non-agricultural in the consumption and production baskets of smallholders. In fact, there is evidence that all over the world, Asia, Africa and Latin America, smallholders may have highly diversified income profiles.

Annexe Table 1—Trade Liberalization Studies

Study	Approach	Findings: Does Liberalization Hurt Smallholders?		Remarks
		No	Yes	
Oxfam (1996)	Qualitative study of corn in the Philippines		½ million livelihoods affected with corn imports from US resulting in 30% decline in market prices	Does not take into account net-seller status in a rigorous way.
Watkins (1997)	Qualitative study on various issues; addresses corn sectors in the Philippines and Mexico.		Corn farmers in Mexico and Philippines cannot compete with US imports, small farmers will be destroyed.	
Nadal (2000a & b)	Qualitative study. Focus on corn sector liberalization in Mexico		40% of corn farmers are subsistence producers who supplement with off-farm income. Limited off-farm opportunities imply, retreat further into subsistence.	Also addresses political disempowerment and power relations (agro-industry and exporters have the upper hand).
Rojjanapo (2000)	Qualitative study focussing on Thailand		Liberalization has caused the number of small farms to decline while large farmers and agribusinesses expand their operation. This is mainly because market fluctuations, competition and high cost of purchased inputs have made smallholders uncompetitive	
Ahmad & Tawang ()	Data-based approach to study Malaysia's oil and paddy sector	Smallholders in Palm oils sector likely to benefit.	Paddy farmers would be hurt. Farm incomes decline by 15-60%.	Does not take into account net-seller status.
Deaton (1989)	data-based approach studied impact of change in rice prices on real income in Thailand applying non-parametric techniques to survey data	Rice price increase benefit all rural households but poorest and richest households benefit least		Focus on a single commodity is restrictive. Short-term impact implies household response is not considered; focus on rural poor rather than smallholder
Budd (1993)	data-based approach impact of food price changes on rural welfare in Cote d'Ivoire applying non-	Small farmers not affected. Elasticity of income with respect to food prices is low, marketed		More commodities included, but only impact effect is evaluated; focus

Study	parametric techniques to survey data Approach	surplus response is limited.		on rural poor.
		Findings: Does Liberalization Hurt Smallholders?	Remarks	
		No	Yes	Ambiguous
Barrett & Dorosh (1996)	data-based approach. Use non-parametric techniques to evaluate impact of rice prices after market oriented reforms on farmers welfare in Madagascar. Data on 825 rice-farming households static disequilibrium model.		More than one-third of rice farmers experience welfare losses as a result of rice price increase (by about 20%) after reform. But those with small net sales are unaffected.	Focus on a single commodity is restrictive. Short-term impact implies household response is not considered.
Jayne et al (2000)	Data-based Approach. Simulate elimination of maize import tariffs in Kenya using households survey of 24 districts	Maize price increase as a result of import tariffs is a tax on rural poor & smallholders (52% being net-buyers). So liberalization has positive impact (gains of US\$36.6 million in 1999)		
Jayne et al (1998)	Data based study of grain market reform in Ethiopia. Study 2 crops (maize and teff) for 6 markets.	Benefits to surplus cereal producers after liberalization are evident in most markets and for the 2 cereals examined- wholesale prices for maize and teff in every surplus producing area rose by 2% to 26%. Decline in grain price spreads benefit both surplus producing farmers and grain purchasing households in deficit regions.		It is not clear what the consumption, production and net-selling status of smallholders are.
Ravallion & van de Walle (1991)	Data-based approach. Study price increase in rice on rural households in Indonesia after liberalization.			Reduces the number of poor households, but poor net-buyers become even poorer
Sahn & Sarris (1991)	Data-based approach. Use an econometric model to derive index of real income to study effect of stabilization and structural adjustment on smallholders in Sub-Saharan Africa			No clear pattern. Mixture of gains and losses.
				Takes into account a range of goods on income and expenditure side – exportables, importables and non-tradables

Study	Approach	Findings: Does Liberalization Hurt Smallholders?			Remarks
		No	Yes	Ambiguous	
Barrett (1998)	Data-based approach. Relates price change in rice and production		“Immiserized Growth” hypothesis, price risk averse net-buyer small farmers for sake of food security increase production. Higher production in this instance is a sign not of prosperity but of immiserization.		
Glewwe & Tray (1988)	Data-based study on price changes in Peru and Cote d’Ivoire	The bulk of the poor, rural and self-employed would either benefit from higher farm prices or remain unaffected by of hypothetical price changes for Peru and Cote d’Ivoire.			
Gulati & Kelley (1999)	multi-market model in semi-arid topics in India to evaluate the impact of trade liberalization on different indicators.	With trade liberalization and no change in input prices, cost of living expenditure for different classes (including small farmers) registers declines.		Rural wages are endogeneously determined.	
Minot & Goletti (1998)	Use a multimarket spatial equilibrium model for Vietnam to study effect of rice export liberalization (removal of quota)	Results in higher rice prices (14-22%). Poor households gain in both absolute and relative terms vis-a-vis non-poor households. Rural farmers tend to benefit, with adverse impact on urban and rural non-farm households.		no wage link, but considers substitution possibilities.	
Lofgren, El-Said & Robinson (1999)	Modeling Approach. Dynamically recursive General Equilibrium Model for Morocco, different scenarios involving		Trade Liberalization disfavours rural poor (rainfed areas). But with non-distorting resource transfers, welfare of all households increase.	Emphasizes role of complementary policies	
Storm (1999)	multi-period CGE Model focussing on agriculture for evaluating distributional impact of trade policies in India.			Does not discuss specifically the smallholders	
				Land-owning classes benefit but not workers. Smallholders may be both. Net effect is ambiguous.	

Study	Approach	Findings: Does Liberalization Hurt Smallholders?		Remarks
		No	Yes	
Levy & van Wijnbergen (1992)	CGE Model to study free trade under NAFTA for Mexico		Adversely impacts maize producers in Mexico, particularly small farmers, whose productivity levels are much lower than the US Mid-West.	
Cogneau & Robilliard (2000)	Use microsimulation techniques on disaggregated household level data which is integrated into a CGE model – Madagascar.			Suggests that given wide range of household positions in markets for goods and factors, impact is highly complex. Partial equilibrium analysis or use of representative agents would miss out on this.
Harris (2001)	Uses CGE Model to evaluate domestic policy reform (price support versus direct payments) in Mexico		In the event of a negative external shock, price supports, producer & consumer subsidies are better than lump-sum payments for rural incomes	Focus is on domestic policy rather than trade liberalization per se.
Gerard, Marty, Lancon and Versprauch (1998)	A three module (macro-module, farm sector production module & commodity-chain module) model focussing on agriculture		Farms in rain-fed areas and landless are worse off after liberalization. But increased off-farm opportunities has positive impact. Overall, liberalization had negative impact on agricultural incomes.	Off-farm employment effects could be positive.
Bautista, Lofgren & Thomas(1998) ;Bautista & Thomas (2000)	Use CGE Model for Zimbabwe to examine income and equity effects of trade liberalization with and without complementary policies	Trade policy reform increases aggregate disposable household income, but least income gains for smallholders who comprise 4/5 th of the poor.		Complementary policies result in more equitable distribution of gains

Study	Approach	Findings: Does Liberalization Hurt Smallholders?			Remarks
		No	Yes	Ambiguous	
Bautista & Thomas (1997)	CGE model for the Philippines. Studies 3 trade policy adjustments- general import surtax, import rationing and tariff reduction.	Tariff liberalization yields larger income benefits to small-farm and "other rural" households relative to the more affluent Metro Manila, other urban, and large-farm households.			
Lofgren (2001)	CGE Model for Malawi calibrated to a SAM (1997-98 Malawian integrated households survey). The aim is to study poverty alleviation and gauge vulnerability to shocks (change in prices, real exchange rate, etc.)	Agricultural households are less exposed when incomes are diversified with a substantial non-agricultural component. Real depreciation has a pro-rural bias. Self targeted public works has significant gains for rural poor but negative impact on non-agricultural households			Emphasizes role of income diversification; also points to role of complementary policies.

The need to have detailed analysis of data on structure of household incomes, consumption bundles, output, etc. has been recognized but doing so led to no unequivocal pattern of change in real welfare of smallholders across countries (Sahn and Sarris 1991⁷).

The comprehensive coverage of the production and consumption baskets still misses out on two issues: (a) Within the smallholder group, studies often do not distinguish household types; welfare implications may be very different for smallholders with different production and consumption profiles (b) Models of the kind described above do not allow for substitution possibilities in production and consumption in the long run. All in all, the focus on estimating welfare effects of price changes in the short-term and the focus on a single commodity tends to, as Barrett and Dorosh admit, somewhat circumscribe the policy implications of their analysis.

The fact is, *household response to price change is crucial to whether the smallholder benefits or not*. It is expected that in the medium and long term, cropping patterns of small holders would shift to crops whose relative profitability is higher or simplistically to those crops whose prices rise if they are net sellers. On the consumption front, they could to the extent possible substitute between commodities in favour of those whose relative prices decline. In particular, decisions regarding what they produce for self-consumption and what they buy and sell in the market are critical as is the response

⁷ Their study of 5 African countries – Cote d’Ivoire, Ghana, Malawi, Madagascar and Tanzania, shows that across these five countries, the share of non-agricultural income earned is 13-58% while agricultural income ranged between 39% and 81%. Also an interesting feature is that a very high share of total agricultural income was from non-tradable goods, a major portion of which was sold locally.

of marketed surplus. In short, the response to changes induced by liberalization would determine if the smallholder retreats into subsistence or rides the globalization wave.

Studies suggest that either could happen (Barrett 1998; Nadal 2000a&b). Barrett (1998) for instance proposes an “immiserized growth hypothesis”, wherein the heightened food insecurity that price increase entails for price risk-averse net-buyers among small farmers actually induces small farmers to increase output possibly through increased application of labour. This is a case of a retreat into subsistence⁸. Somewhat in contrast are findings that the bulk of the poor, rural and self-employed would either benefit from higher farm prices or remain unaffected by hypothetical price changes (Glewwe and de Tray 1988 for Cote d’Ivoire, Minot & Goletti for Viet Nam, Gulati & Kelly 1999 for India).

Household response is something that has been most effectively integrated into several *modeling frameworks*. Data-based approaches have limited scope for such a comprehensive characterization of household behavior. Agricultural household models

⁸ Barrett (1998) found that following far-reaching reform of rice markets, mean national rice prices increased by 42% (variance by 53%). Output growth in response to these price changes was positive but concentrated disproportionately among small farmers. This was somewhat paradoxical since during this time, data showed deepening rural poverty and deteriorating living standards. The explanation, he casts in the form of “immiserized growth hypothesis”, wherein the heightened food insecurity that price increase entails for price risk-averse net-buyers among small farmers actually induces them to increase output possibly through increased application of labour. This is particularly true in an environment of incomplete or imperfect markets. Although Barrett does not venture to test the hypothesis, he demonstrates using survey data (1990 national survey of 825 rice farmers) that this may indeed have happened in Madagascar. Barrett also offers alternative explanations (like technological change in small farmers, migration, etc.) that may result in similar correlations in output and poverty but rules them out for Madagascar. His focus on a single commodity is a limitation.

on the other hand, offer scope for a formal treatment of household response usually through incorporation of a supply response function, a marketed surplus response function and a consumption function (Singh et al 1986). There have been several studies analyzing pricing policies for a number of different countries (Singh and Janakiram, 1986 for Nigeria and Korea; Braverman and Hammer, 1986 for Senegal, Braverman et al, 1986 for Korea etc.; many stress the importance of linking up different commodity markets that allows for substitution possibilities). The findings are again fairly diverse many suggesting favourable impact on real incomes (Gulati and Kelly 1999, Minot and Goletti 1999) but not always on inequality.

b. Price Volatility

The other anticipated consequence of trade liberalization is *price volatility*. Removal of border protection (particularly those like quantitative restrictions) exposes domestic agricultural sectors to world prices so that greater fluctuations in world prices consequent to trade liberalization get transmitted to domestic prices. For small farmers with limited means to safeguard against downswings, such volatility could push them to the very brink of destitution. Such fears have been articulated in several assessments of the impact effect (Nayar and Sen 1994, Rojjanapo 2000 for Thailand; Nadal 2000 a&b for Mexico, Karanja 2002 for small coffee growers in Kenya; Barrett & Dorosh 1996 for rice prices in Madagascar). Empirical estimates on *international price volatility* however tend to conclude differently. While prices *are* volatile, there is no indication that they are systematically linked to trade liberalization (Sarris 1997 for cereals, Harwood for corn,

Quiroz et al cited in Foster and Valdes 2002) in a way that would lead us to conclude that liberalization contributes to volatility.

Perhaps more than volatility the problem faced by farmers in developing countries is the *prolonged periods of low international prices* (Valdes and Foster 2002)⁹. The reasons for this are several, most important of which are developed country policies that offer counter cyclical emergency assistance to farmers when world prices fall. This has the effect of deflecting the downswing in prices back to international markets instead of absorbing them. Under such a situation, small farmers in developing countries have few options to tide over periods of low prices. While there may be feasible solutions for price risk management in the short run (indeed, there have been several success stories in price risk management in developing countries, chief of which is the role of financial markets that reduce price volatility; Karanja 2002), they may not help for prolonged downswings in prices. Here what may be more important is the streamlining of distortionary agricultural policies of developed countries under the WTO trade negotiations.

The Caveats

Assessments of impact effect of trade liberalization, specifically quantitative assessments that use modeling approach, often assume away problems of *price transmission* and *structural and institutional constraints* in smallholders' environment.

⁹ For instance, Cashin, Liang and McDermott (1999) observe that low prices endure for more months than high prices. For wheat, international price shocks have a median half-life of 44 months. There is a probability of 50% that prices prevail below the expected value (declining over time) for more than 44 months.

These can however be extremely important determinants of how smallholders in developing countries fare, and therefore merit special attention.

a. Price Transmission

Most studies that evaluate the impact effect of trade liberalization tend to assume that price changes at the border are transmitted smoothly right down to the farmer. However, typically in developing countries, there may be a huge difference between the border prices and the prices faced by the smallholder reflecting weak price transmission (Quiroz and Soto 1999, Sarris 1997)¹⁰. The extent of price transmission varies depending on a range of factors from domestic and external policies to structural and institutional factors.

Weak price transmission could have two very different effects. On the one hand, rural low-income households may be somewhat isolated from the cash economy – the insulation could protect them from adverse impact of price changes at the border. On the other hand, there could be *asymmetric price transmission* wherein farmers end up paying more for what they buy be it inputs or other importables, but not be able to gain from higher prices for their output (as in Rwanda, Minot 1998). Or it could be that market power among buyers of produce could effectively prevent net-selling smallholders from benefiting from price rises. Alternatively, as Nadal (2000 a & b) claims, small corn farmers do not benefit from reductions in corn prices as buyers since tortilla industry

¹⁰ For instance, Quiroz and Soto (1995) conclude based on an analysis of 78 countries that “in an overwhelming majority of cases, transmission of price signals in agriculture is either non-existent or low, by any reasonable standard”. Sarris (1997) too mentions low transmission coefficient of 0.24 and 0.58 in the short and long run.

cartels prevented passing the 50% price reductions to consumers of corn products, although they would still benefit from reduced price if they were to buy corn directly from the market.

Another oft-neglected aspect is that smallholders often sell in a buyers market when prices are low and may buy off-season in a seller's market when prices are high. In such a case, it is the traders who benefit and not the smallholder farmer. In Malawi, traders have emerged as important players buying food commodities from farmers and selling them to urban consumers or exporters (Parris 1999).

Thus, when the issue of price transmission is taken into account, the prognosis for the smallholder could be quite different from what models assuming perfect transmission would ordinarily predict.

b. Institutional and Structural Factors

Closely related to the question of price transmission are institutional and structural constraints. A burgeoning literature, much of which is informed by a New Institutional Economics perspective, have highlighted structural and institutional factors that result in high transactions costs often constraining the smallholder from exploiting opportunities opened by trade or intensify the adverse impacts (See Delgado 1999, McCulloch et al 2001; Kydd et al, 1996). It is hence important to know what these constraints are, how they affect smallholders, and what has been the experience of developing countries in tackling these constraints (Table 2).

Table 2—Transactions Costs and other Constraints: What is the way Out?

Issue	Constraint	Solutions
<i>Credit</i>	Reliance on informal sources of credit at often usurious rates.	Micro-finance Credit cards Warehouse receipt systems Repos & other financial innovations
<i>Assets</i>	Limited access to assets: land and livestock.	Initial transfers of capital, livestock, etc. Streamlining land records, titles.
<i>Markets</i>	Limited access to markets.	Physical infrastructure, storage, warehousing and transport and communication facilities
<i>Information</i>	Lack of reliable information about markets	Market Information Systems through radio, internet Improvements in rural communications facilities
<i>Infrastructure</i>	Poor quality of physical infrastructure (roads, power, irrigation and communication)	Greater and more efficient public spending in critical areas (roads, power, irrigation, etc.) Institutional reform (collective action etc.) for managing these systems
<i>Human Capital</i>	Socio-demographic characteristics of household; Labour endowments, etc.	Social infrastructure – literacy, health.
<i>Inputs</i>	Access to modern inputs and price of these inputs	Seed contracts Interlinking transactions (greater vertical coordination through contract farming, etc.)
<i>Legislation</i>	Tenancy laws, land ceiling and land lease legislation	Legislative Reform
<i>Insurance</i>	Limited access to insurance for production and price risks.	Crop insurance schemes, Commodity exchanges, Futures markets Warehouse receipts, etc.
<i>Technology</i>	Limited access to technology	Public sector research on small farm and natural resource management of resource-poor region Proper extension and training (by private, public sector, international organization and NGOs)

Does the small farmer household have access to natural assets? Studies suggest benefits from liberalization depend largely on **access to assets** (Dercon, 1998;

Watkins,1997¹¹). Disadvantaged households are typically land-poor (and landless) and usually lack access to other productive assets. Under the circumstances, export crop-production per se is unlikely to have substantial benefits for this section. Delgado (1998) emphasizes that asset deficit problems of resource-poor smallholders must be addressed in a way that improves incentives for market participation, else it could add to transactions cost rather than alleviate them.

Are physical distribution costs too high? Physical distribution costs are of great importance since they drive a wedge between border prices and domestic prices, determining if a good is an exportable, importable or non-tradable. On the one hand, transport, marketing and distribution costs could be so high that it insulates a particular region completely from the effects of trade liberalization, so that they continue to remain in subsistence cultivating primarily non-tradables. While this offers a certain degree of protection it is not necessarily beneficial, since it also prevents smallholders from gaining from exports, even in intra-national trade (Dembele and Staatz for Mali 1999, Oxfam 1996 corn production in Mindanao, Philippines¹², Alwang et al 1996). Sometimes, high marketing costs of food imports into a certain region drives back even export-oriented smallholders to preserve food self-sufficiency. Consequently, cash crops, despite having

¹¹ While in Mexico and Zimbabwe, cash crop production that liberalization has encouraged concentration in richer regions of the country, in Brazil, it precipitated land grabbing by rich and powerful farmers leading to dispossessed poor farmers.

¹² Oxfam (1996) observes that in Philippines, given the low productivity in yellow corn in some parts – Mindanao – and the high marketing costs to deliver produce from farms here to markets like Manila, they would be unable to compete with US corn or Thai corn imports that would be anywhere in the range of 20-39% below domestic prices in the Philippines in 2000-04. About 1.2 million households would be affected and could see their average household income decline by 15% by 2000 and 30% by 2004.

high returns to land and labour, may not be a viable alternative for these small farmers (as Jayne 1994 found in Zimbabwe).

Indeed, it has been shown that poor groups that *have* benefited from the gains of reform (in food markets, taxation and devaluation) had relatively good land and access to roads and towns (Dercon, 1998 for Ethiopia).

Do small farmers have the necessary human capital? To some extent this would depend on the socio-demographic characteristics of the household and its labour endowments. It is possible that if landholdings are larger or more productive or in a larger family, the household can spare a member to work in non-farm activities (Barrett et al 2001). Intergenerationally however, large families imply greater fragmentation of landholding, leading to more smallholdings, which could get smaller, as in India (Singh and Kumar, 2002).

More important is perhaps the education level and knowledge base of small farm households to meet the new challenges and access available scientific and technological services. *Literacy* has been noted as a critical factor in the adoption of technology, total factor productivity growth (TFP) among others (Fan et al 1999, Mittal and Kumar, 2000).

Do small farmers have access to inputs, credit, insurance, and information?

Access to modern inputs is often a problem for smallholders, particularly those in remote regions. Since, typically the quantities demanded may be small, private marketing channels may be non-existent in these areas. In the absence of the public sector, other institutional innovations would have to be conceived. Seed contracts for instance are something that has been successfully applied in parts of India. Several NGOs too have been involved in facilitating resource-poor farmers' access to inputs in developing

countries. A related question in the context of an input constraint is the movement in *input prices*. For instance, a simultaneous increase in input prices, alongside increasing producer prices could squeeze the profit margins. Thus the input side is important because it can overturn the welfare effects of output price changes by determining the operating margins for smallholders (Gulati and Kelley 1999 for India, Oxfam 1999 for Zambia).

There is increasing consensus that *credit constraints* are at the basis of the poor farmers' weak response to liberalization (Lopez et al 1995's study of Mexico, Alwang et al 1996 for Zambia¹³). Interestingly, credit constraints also has the effect of keeping small farmers in the labour market in spite of rising cereal prices since wages enabled them to escape the credit constraints (de Janvry et al 1992).

Informal sector lending at usurious rates predominates, with formal and timely finance out of reach of most farmers. In the mid-1990s, in Nepal, 81% of rural borrowing was from informal sources, and in Nigeria it was 30% from moneylenders and 40% from *esusu* clubs (or cooperative credit arrangements). Within countries, poorer farmers rely disproportionately on informal means of finance as in Nepal, Pakistan, India and Thailand (World Bank, 2002). While some traditional systems have their own merits, ways and means of improving small farmer access to credit has been a major concern of policy makers for some time now and has led to devising new schemes like the kisan

¹³ This is true even for small-scale dairy where credit seemed to be among the top constraints (Falvey and Chantalakhana 1999).

credit card scheme in India (Box 1), repos in Columbian livestock (Box 2) and other means of interlinking transactions (Box 3). Early indications are that these may be financially sustainable ways of alleviating credit constraints.

Box 1—Kisan Credit Card Scheme (KCC), India: A Phenomenal Success

In 1998-99, the Government of India established the Kisan credit card scheme. Under this scheme farmers are eligible for production credit of Rs. 5000 and above issued against a kisan card and a pass-book or a card-cum pass book, valid for 3 years subject to annual review. It provides a revolving cash credit facility with unrestricted number of drawals and repayments within the credit limit. Credit limits are fixed depending on need (determined by production credit required for a full year, plus ancillary activities related to crop production), operational landholding, cropping pattern and scale of finance. Each drawal has to be paid within 12 months. Credit limits are often revised to take into account cropping pattern changes, increase in costs etc. There is also flexibility to reschedule loans in case of natural calamity.

By 31 March 2001, 353 District Central Cooperative Banks, 192 Regional Rural Banks and 27 Commercial Banks were participating in the scheme while by 31 January 2001, over 13.4 million credit cards had been issued to farmers by cooperative banks, commercial banks and regional rural banks in that order.

Studies revealed that the KCC Scheme had been generally well received, both by the banks and the farmers. It has smoothened the flow of credit to the farmers overcoming many of the problems arising out of procedural delays in sanction and release of loans. The borrowers' advantages were in the form of timeliness in availability of credit and reduction in interest burden due to flexible operations, while the implementing banks benefited by avoidance of repeat processing of loan documents every year and improvement in recovery. The Union Budget 2001-02 set a target to cover all eligible farmers in 3 years.

Source: NABARD (2002)

Box 2—Columbia: Repos for Livestock financing

Colombia's National Agricultural and Livestock Exchange (BNA) designed an innovative livestock securitization programme in 2000. Under the programme, funds for the feeding of beef cattle were raised from local institutional investors through livestock-backed securities offered and traded on the BNA and the country's securities exchanges. Tight supervision reduced risks for the investors to the minimum. Cattlemen in selected regions who met certain selection criteria signed contracts with a Trust, transferring the ownership rights to their cattle. The Trust then sold securities on the basis of these contracts, and paid the farmers the funds received. To ensure that farmers, working as agents of the Trust, properly fed their cattle, an independent company provided extension and quality control services – and was liable to the Trust if its services were ineffective. The marketing of the cattle was controlled by an independent marketing agent, who was obliged to transfer the funds received to the Trust, which assigned them in priority to the "repurchase" of their cattle by the cattlemen (in effect, most cattle sales were through the BNA auction system). Insurance covers the risk of criminal or terrorist acts. Repos were at the basis of the financing – cattlemen sold their cattle to the Trust, and then acted as agents for the trust, before buying their animals back. Several series of securities were successfully issued under the programme, with strong interest from both cattlemen and investors.

Source: UNCTAD, 2002

Box 3—India: agricultural credit backed by sales to processors

A recent form of providing credit has emerged in India in the late 1990s. Banks as well as equipment providers provide inputs (say tractors) on credit to farmers who sell to processing plants, with the reimbursement of the loan deducted from payments the processor makes to farmers, which are in turn linked to the credit-making institution. It is too early to call this scheme a success, but on the face of it, appears to be a win-win situation where the small farmer's access to credit is linked with access to inputs.

Source: UNCTAD, 2002

A particularly important issue that has been raised in the context of liberalized agricultural markets is *insurance*. Small farmers are particularly vulnerable to two kinds of risks – *production risks* (represented by crop failure, etc.) and *price risks* (greater volatility and extraordinary and persisting low prices). Faced with risky environments, rural households often resort to selling their assets to smooth consumption (Rosenzweig and Wolpin 1993), but sometimes even this may not be feasible (Fafchamps et al 1998)¹⁴ highlighting the need for credible insurance mechanisms¹⁵.

Formal mechanisms are very difficult to implement particularly in large developing countries or where small farmers are numerous and widely scattered. While crop insurance schemes have been in place in some countries, there is not much information on the degree to which small farmers benefit from this. Where they have failed, they have contributed to the decline of agricultural banks (Seibel 2000 cited in World Bank 2002). Or, as the crop insurance scheme in India demonstrated that it offered

¹⁴ Rosenzweig & Wolpin (1993) point out that in India, livestock is used as savings and sold in times of distress; this was observed to be a fairly successful strategy given well-integrated markets for cattle and stable prices. However, in Burkina Faso, this did not happen – possibly because widespread agricultural shock meant more contemporaneous decision by households to sell livestock and lower the efficacy in smoothing consumption (Fafchamps et al 1998).

¹⁵ For detailed discussions on social risk management, see Siegel and Alwang (1999).

considerable subsidies bringing to the fore questions of sustainability. Insurance arrangements in developing countries have tended to be informal often bundling credit and insurance depending on nature and degree of shocks affecting borrowers (as in northern Nigeria, World Bank, 2002).

Implementing price risk management schemes is even more difficult, but attempts have been made in several developing countries through futures markets, forward contracting (particularly for non-staple cash crops), commodity exchanges, warehouse receipts systems and so on (Box 4). Many of these double up as credit instruments and have been happy examples of success.

Another major constraint is *information* about markets. Reliance on trader information and limited access to reliable information implies smallholders often end up selling in a buyers market and as consumers buying in a selling market (Parris 1999).

Box 4—Pepper in Malaysia: A government Agency as Warehouse Receipt Financing Intermediary

In 1998, Malaysia's Pepper Marketing Board (PMB) introduced a Warehouse receipt System. Farmers deliver pepper to one of PMB's warehouses in Sibul, Sarikei or Kuching for storage for between 1 to 6 months. A Pepper Ownership Certificate enables the farmer to pledge stocks for a loan, subject to the transaction being registered with the PMB. The holders of the Certificate pay warehousing costs. The scheme has been as much a physical marketing tool as a financing tool.

Source: UNCTAD, 2002

Until recently, public sector systems were not widespread – only 53 systems were identified in a survey of 120 countries (Shepherd, 1997). However, this is changing. Already establishment of Market Information Systems (MIS) through local and national radio (Box 5) have contributed to greater spatial integration of prices indicating that farmers have perhaps been able to respond to the prices in surrounding regions (Rashid, 2002a for Uganda). Use of the internet as means of communicating market information, often on private sector initiative, is emerging. Similarly, exchange of market information in Ghana, the Philippines and Bangladesh was boosted when governments granted licenses to mobile telephone companies making rural access a condition.

Box 5—Successful Market Information Systems In Developing Countries

Indonesia's MIS is widely regarded as a success. Here market prices of vegetables are broadcast daily on provincial radio stations in major production areas. It has been observed that knowledge of market prices and trends enables farmers to negotiate with traders from a position of relative strength. This happens either in their ability to choose certain traders over others, improve their quality of produce or even simply using broadcast prices as starting point for negotiations the following day. In **Uganda**, the International Institute of Tropical Agriculture (IITA) along with USAID and Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA) have established a national level MIS that broadcasts over national radio weekly prices for 28 commodities in 19 districts. This is supported by analysis and other relevant information like the transport situation, markets turnover and number and types of buyers. This has resulted in greater integration of prices across markets reflecting regional trade, which might have been absent due to lack of market information. In **Mali**, 1999 saw decentralization of the existing MIS and the creation of 22 local offices in addition to a central office. Information on markets is thus now transmitted locally through 24 local radio stations on crops of regional interest. The source of funding has also seen a change from dependence on PRMC (Cereal Market Restructuring Program) donor funds to full financing by the Government. The MIS in Mali is on the verge of extending into electronic commerce for food crops. Similar MIS with marginal operational differences exist in **Zimbabwe** (on national state-owned radio) and **Mozambique** (local stations against payment) as well. All appear to have benefited farmers.

Source: Shepherd (2002)

Traders have now been able to have their own market information networks (Chaudhury and Banerji, 2001 cited in World Bank, 2002). The concern here is one of sustainability. With MIS being contingent on availability of funds from donors or national governments, there are problems regarding the long-term sustainability. For instance, in Mali's older MIS, data collection costs accounted for 64% of the MIS's operating budget (Shepherd 2002). Ways would thus have to be found to operate these MIS on a self-sustaining basis.

Are institutional structures after liberalization inimical to small farmer interests? Typically changes in institutional structures brought about by policy changes that involve withdrawal of the state from different activities (particularly marketing and procuring). The impact of this is ambiguous – while *it can have adverse impact in some cases, in others it has had beneficial impact on small farmers.*

Where competition has been fostered among private traders with the withdrawal of the state, it has helped farmers secure higher prices for their output (Oxfam-IDS 1999, Winters 2000, Tschirley et al 1999)¹⁶. Private trade also often fosters better geographical distribution of grains, particularly improving grain availability in deficit areas.

Equally however, there have been instances where domestic market reforms have hurt. In Zambia for instance, small farmers in isolated areas had benefited from the official purchasing organization through pan-seasonal and pan-regional pricing. With

¹⁶ This happened in Zambia where state milling was replaced by private mills. A similar situation occurred in Zimbabwe as well. Whereas under monopsony procurement of cotton by the state forced down prices (to provide cheap raw materials to the textile industry), withdrawal of the state resulted in three competitive buyers who as a result offered more remunerative prices to the farmer.

liberalization, it was replaced by private buyers who possibly colluded and stopped purchasing from these farmers altogether. These farmers hence had no access to the market whatsoever (Oxfam-IDS 1999 and Winters 2000). In another vein, Butawega and Awori (1998) point out that some African governments tend to support large farmers in horticulture and flower production over small farmers. Smallholders may then not really benefit from export-led agricultural production that motivates post-trade liberalization agriculture in developing countries.

Constraints could also come from institutions of another kind namely *legislative frameworks*, which could pose problems particularly in terms of exit-options that it has for small farmers to move from agriculture to other sectors. These could refer to land ceiling laws, tenancy laws etc. In several countries, laws favour the agricultural tenants over the landlords for obvious reasons. It is possible that the small farmer would decide to lease out land to a big farmer and choose to work as an agricultural labourer instead if the wages are attractive enough. These *tenancy laws* would then begin to have a counterintuitive effect, where it protects the large-farmer-tenant. This is known to act as a major deterring factor for small farmers to reallocate their labour. Also, to the extent that the small farmers may be willing to give up the land (if there is alternate employment), *land ceiling laws* may emerge as constraints. While they may be effective instruments of equity, viewed in this context, they might constrain agro-industries from expanding to the optimal size, even if they have a large positive effect on aggregate employment (as in Peru, Escobal et al 2000).

Given the importance of institutions, it is central to any discussion of the small farmer, and hence needs to be addressed explicitly apart from the usual price and output

changes. Trade liberalization studies often make facilitating assumptions that tend to undervalue the major role played by these constraints in limiting ability of smallholders to take advantage of opportunities. The review of studies shows that this area deserves attention. The upshot of different studies is that despite the many constraints, several countries have designed and implemented schemes to overcome these constraints and happily with much success.

Incorporating Second Round Effects: Factor Earnings

So far, the focus was on assessments of impact effect and on aspects that are often neglected in impact studies. In the long run, however, the impact effect itself could get dissipated, be overturned or exacerbated by *second-round effects* operating primarily through linkages between various activities within rural economies although linkages with urban sector are also likely to have some impact¹⁷. Other linkages include direct upstream and downstream production linkages, investment linkages and indirect consumption or expenditure linkages (Delgado et al 1998, Kydd et al 2001 and McCulloch et al 2001).

Of all the linkages, *factor earnings* have come to be acknowledged as a critical component in assessing welfare impact of trade liberalization (Reimer 2002) and particularly relevant for smallholders – hence the focus in this paper. Even if small

¹⁷ It has been established that multiplier effects in rural areas of agricultural incomes are very high. While in Asia a dollar increase in agricultural incomes resulted in an additional 80 cents for non-agricultural income for local enterprises, for selected countries in Africa it was estimated to be over two dollars (Delgado, et al 1998). Hazell and Hojjati (1995) found that the often prohibitive costs of trading in many rural areas in developing countries implies that much of the multiplier effect is driven primarily by household consumption demand and production linkages predominantly within the rural farm and non-farm economies.

farmers were to lose in the short run (with benefits cornered by larger farmers), in the long run, they could benefit from farm and non-farm activities through greater employment opportunities. This could happen either through (1) greater aggregate employment or more gainful employment or (2) higher wage earnings, which could come from *rural on-farm wages*, *rural non-farm incomes* and also *urban earnings*. Naturally, this is contingent on the factors that may affect the non-farm sectors quite independently of the agricultural sectors.

For smallholders, *on-farm income* from agricultural wages is often an important supplemental earning. If higher food prices were to stimulate food production, which increases demand for agricultural labour this could push up wages. Under such circumstances, while net-buyers of food would be adversely affected by food price increases in the short run, could gain through wage increases over a longer time period, highlighting the need to gauge the responsiveness of wages with respect to (output) prices (Warr 2001, Ravallion 1990, Rashid 2002b)¹⁸. Existing data also suggests that *rural non-farm income* may be quite important – more so in Latin America and Africa than in Asia. In the late 1990s, in Latin America, on an average, as much as 46% of rural

¹⁸ In a study of a proposed rice export tax in Thailand, Warr (2001) found that the resultant decline in domestic rice prices would also drive down wages of unskilled labour, which is employed extensively in the rice industry. The outcome for the rural (and urban) poor who derived 40% of their income from unskilled employment is interesting – the consumption benefit of a decline in rice prices was outweighed by a negative income effect of driven down unskilled wages.

household income of selected countries came from non-farm sources (with a weighted average proportion of 40%). The proportion is close to 45% in Africa and a lower 35% in Asia. The interesting finding is that this share may be increasing, particularly in Latin America both in absolute and relative terms¹⁹. Similarly, *urban wages* could also be a significant part of smallholder income. For instance, seasonal rural-urban migration is common among small farmers in many developing countries – more common in Asia than in Latin America or Africa (where contrary to popular belief migration income is far outdone by non-farm incomes; Reardon et al 2001). In Asian countries such as China, part-time farming is widespread (Taylor 2002), while in India and Thailand, urban centres are receptacles of seasonal labour from the countryside.

As far as empirical studies are concerned, which factor in these linkages, rural factor markets have been effectively integrated into what have come to be known as multi-market models, which extend the basic agricultural household model to several commodity markets and allow rural wages to be endogenously determined (Barnum and Squire 1971, Smith and Strauss 1986, Braverman et al 1986, Gulati and Kelley 1999). These offer a more complete treatment of the link between prices and rural wages. The enriching of models to include non-farm sectors (rural and urban), on the other hand, culminates in general equilibrium modeling (Computable General Equilibrium modeling) that captures not only rural non-farm linkages but also economy wide linkages. These

¹⁹ A study of several Latin American countries (Chile, Colombia, Costa Rica, Honduras, Mexico, Panama, El Salvador), rural non-farm employment has been increasing both in absolute and relative terms. In Ecuador, from a share in rural employment of 20% in 1974, by 1994, those in the rural non-farm sector had risen to 36.4%.

models are sensitive to the assumptions made regarding closures, specification of relationships and the number of representative agents identified. Given the diversity in the models, the predicted outcomes of policy shocks representing liberalization are equally diverse. However, the major findings are:

- When trade liberalization alone is undertaken, it often has adverse impacts for the rural poor. But when *complementary policies* are also undertaken simultaneously, it has the potential to overturn adverse impact. These models thus emphasize the importance of complementary policies (land redistribution, self-targeted rural works programs, restructuring of government expenditures and taxation, etc. Lofgren, El-Said & Robinson 1999, Bautista et al 1998, Bautista & Thomas 2000).
- When rural households have *highly diversified income*, they are less prone or vulnerable to shocks (Lofgren 2001, for instance)
- It is possible that apart from (or rather than) changes in wage rates, with trade liberalization, there may be overall positive effects on aggregate *employment*. (see Gerard et al 1998)

While these results from modeling exercises are instructive, it is essential to go beyond mere numbers and see what motivates the rural poor to diversify their sources of income.

Why do smallholders diversify? What drives rural households to participate in non-farm activities? Are *push factors* at work? Or do *pull factors* dominate? It is immediately obvious that the two imply very different things as far as the welfare of smallholders is concerned. Studies in Africa and Latin America suggest that although rural non-farm income and employment are important for both, in Africa they tend to be

driven more by *push* factors and in Latin America it is more on account of *pull* factors (Reardon et al 2001, Barrett et al 2001)²⁰.

The dynamics of smallholder livelihood strategies needs special attention and it is unlikely that models studying trade liberalization however sophisticated manage to capture the various dimensions in all their complexity.

It is evident from the above survey of works that trade liberalization and its impact on smallholders (and more generally the rural poor) has attracted considerable attention. Interest in how these global drivers and meta-trends impact specifically on the smallholder has, by comparison, surfaced only recently. For smallholders, issues such as Intellectual Property Rights, food safety concerns, foreign direct investment and growing concentration in food industries and technological advances are the most critical. These are taken up one by one in the following sections.

²⁰Interestingly there is in operation what might be called a “meso-paradox”. Households in resource poor regions are driven to diversify their income profile, but their capacity to develop non-farm activities is weak and given their low skills are less likely to corner the better opportunities, instead crowding into low-productivity, low-pay jobs in the non-farm sector forcing them to remain poor. In Peru’s Chinchu region, of surveyed farm households, 22% derived some income from at home non-farm activities which were mainly small-scale processing (cheese and yogurt), machinery rental, commerce and cottage manufacturing, most of which required initial capital. Probability of participation hence increased with farm size. However away-from-home-employment was relatively more common among households with less land and were invariably in jobs that had low entry requirements in terms of financial capital and education.

INTELLECTUAL PROPERTY RIGHTS

Intellectual Property Rights have figured prominently in recent discussions on globalization and technological progress as a result of the Agreement on Trade Related Intellectual Property Rights (TRIPS). Less discussed are its implications for small farmers across the world.

Even while encouraging innovation and research in the private sector, it is widely recognized that the private sector focuses on “widely transferable or profitable near-market technologies” (Pardey and Wright 2001). Given that much research, which has high social payoffs, may not be profitable to private parties and would remain neglected if public research does not fill this vacuum. It is possible to think of research on technologies that would help resource-poor small farmers as belonging to this domain.

At another level, technology protected as intellectual property is now highly concentrated in a few large multinationals based in the West. This could have two distinct effects. Ironically, even while promoting private investment in research, it could prevent public sector and non-profit researchers from accessing developments in the private sphere (Pardey and Wright 2001). Although there has been much discussion on how this would affect the flow of resources and how these change power relations between players – public sector agricultural research organizations and multinationals²¹ – few have studied the other important implication of such concentration in the seed industry. For the

²¹ Lesser et al (2000) for instance discuss the links between agricultural biotechnology, IPRs, national research organizations and the multinationals.

smallholders, the important question is whether with seed industries becoming more monopolistic, do the seeds become more expensive and go beyond their reach, than before? Or is the farmer's choice of available seeds more restricted? If this indeed is the case, then it might be necessary to use trade and competition policy instruments to offset market power granted to right holders (Maskus 2001).

On the other hand, if it is conceivable that the small farmers too patent their traditional varieties and there is some sort of benefit sharing, it could encourage the small farmer to innovate. Similarly, it is possible that if IPRs do indeed promote innovation there could be enough positive feedback to small farmers in terms of productivity increases to counter the effects of increased seed prices. However this would be in the long run and are issues that have not been documented so far although instances of private sector initiatives do provide some possibilities (Box 6).

Box 6—Building Capacity to Manage Intellectual Property in Developing Countries

The Kenyan Agriculture Research Institute (KARI) and Monsanto established a partnership to develop virus-resistant sweet potatoes, with Monsanto providing royalty-free licensing of intellectual property, direct funding, basic research components, and technical assistance for KARI to develop and test the product in preparation for its release in 2002. In Mexico a multinational corporation contracted to sell intellectual property to large-scale farmers in the lowlands but donated the technology to small, poor farmers in the highlands.

In both cases, the private firms enhanced their public relations image at little opportunity cost, since neither Kenyan nor highland Mexican farmers would have purchased the technologies without the donation.

Source: World Development Report (2002)

TECHNOLOGY

That agriculture has become a hi-tech industry has been recognized for some time now (Josling 1999). Already, bio-technological advances dramatically affect farm-input industries (ex. seed, chemicals) and increasingly, the distribution channels from farm to table (information technology, packaging, processing, storing, transport etc.).

Downstream, improvements in transport, storage (ex. chemical applications to reduce fungus formation) and packaging technologies have fashioned growth of capital-intensive agro-industries in the wholesaling and retailing sectors. Such advances have triggered growth of agri-food sectors including apples and pears in central Chile, vacuum-packed milk in Brazil and shrimp in Ecuador (Reardon and Barrett, 2000). Upstream, use of sophisticated equipment etc. that improve product-quality, reduce labour demand and ensure consistency in quality has expanded significantly. Under the circumstances, the implications for the small farmer in developing countries of the fast pace of technological progress cannot be underestimated. The key questions in this context are: Do these technologies have scale bias? Even if they are scale-neutral, can the smallholder afford and access these technologies?

Does technology have scale-bias?

While on the one hand, adoption of higher yielding cross-bred cows has greatly increased smallholder milk output in India (Candler and Kumar 1998) and Ethiopia (Holloway et al 2001) implying that technology need not always crowd out smallholders through substitution of capital for labour, there is also evidence that an increase in the share of processed products in the agri-food sector implies increase in the capital labour

ratios (Ehui and Delgado 1999). This could mean small farms or firms would be crowded out by the larger businesses, which presumably are able to reap the economies of scale offered by technological advances.

Given such contrary evidence, it is difficult to determine the impact of technology on smallholders. Generally while *biotechnology could be regarded as scale-neutral*, other kinds of *mechanization technology could have scale bias* in favour of the larger farmers or those who are financially more capable²².

Do smallholders have access to technology?

The important issue here (as with biotechnology) could be the *access to technology* rather than the technology per se. Studies have shown that where technology is appropriate to their resource base and constraints, *speed of adoption is not significantly different between small and large farmers*. In fact, it is particularly rapid when such varieties are suited to small farmers in terms of yield, low inputs, risk etc. (See Longhurst 1987, Lipton and Longhurst 1985, Barker and Herdt 1984 cited in Cornia et al, 1987).

Limited access may be due to either of three causes (a) whether technologies are available in the first place for crops of interest to smallholders (b) failure of extension of technology, or reduced government intervention in dissemination of technology (Reardon et al 1999 in Africa, Schejtman, 1998 in Latin America) or (c) quite differently due to

²² For instance, an improvement in transport and storage technology by changing the structure of downstream activities possibly impinges on smaller players (Coyle et al 2001). Adoption of such technology can be exclusionary vis-à-vis the small farmers. In particular, with respect to transport (freight, etc.) of high-value export commodities organizing the logistics through a group to make up volumes could be necessary (UNCTAD, 1999). In addition, technological advances such as dehydration techniques for vegetables, small-scale processing machines for cassava that may be scale-neutral (al Hassan, 2000) would have to be developed.

lack of financial capability of smallholders particularly when many complementary purchased inputs are required.

While the latter can be addressed by tackling the credit constraint, the former would require institutional arrangements. The public sector research institutions have an important role to play too, not just in research but also in frontline demonstrations of technology, providing training, extension services, etc. Here again, there have been instances where private sector has stepped in to provide extension services, enabling farmers' access to quality services (for example the African Agricultural Technology Foundation AATF²³).

Box 7—Private Sector Extension Services: The Case of Argentina

In Argentina, there has been an instance of private sector facilitating extension services to livestock owners. Although here the participation of medium and large-scale farmers may have been higher, a similar scheme for small farmers is not inconceivable – and indeed is an integral part of some contractual relationships with small farmers.

During the 1970s the productivity of Argentine dairy farming was seriously hampered by poor cattle nutrition and poor farm hygiene. Faced with unstable supply and quality problems, the two largest dairy processors—Santa Fe–Cordoba United Cooperatives (SANCOR) and La Serenisima— established extension services for their suppliers.

SANCOR's program included financing for agronomist technical assistance, farm visits, artificial insemination services, and accelerated heifer-rearing programs. By 1990, 120 farmers' groups were participating in the program, and each group had assumed responsibility for the cost of technical assistance. La Serenisima created 25 extension branch offices, each of which provided technical assistance to groups of up to 25 medium-to-large-scale farmers. La Serenisima's program also made extensive use of press and broadcasting media to inform farmers of livestock management techniques.

The results of these private extension efforts were extremely positive. Although the number of dairy farms supplying SANCOR decreased by 24 percent, milk production increased by 15 percent between 1976 and 1985. Milk production for La Serenisima jumped by almost 50 per-cent despite a 6 percent decrease in dairy farm areas of suppliers.

Source: World Bank (2002)

²³ The AATF is a public-private initiative to link needs of resource-poor small farmers in Sub-Saharan Africa to potential technological solutions by acquiring royalty free licenses or agreements to adapt and transfer know how and the distribution of technology (Terry and Clough).

DEMAND SHIFTS, PER CAPITA INCOMES AND URBANIZATION

It is well recognized that growing income, urbanization, demographic shifts, improved transportation and evolving consumer perceptions regarding quality and safety are changing the *structure of food consumption patterns* globally. Of these, income growth and urbanization are the chief factors for these shifts in developing countries while, in developed countries, food quality, safety and health considerations are becoming increasingly important.

For instance, in the United States alone, the share of red meat in total meat consumption fell from 79% in 1970 to 62% in 2000, with poultry increasing from 21 to 38% in the same period reflecting health concerns. Per capita consumption of fruits and vegetables increased by 25% in the 20 year period 1977-99 (USDA 2001). A related phenomenon is the growth in demand for organic food in these countries. In developing countries, there is a clear shift away from unprocessed staples to higher value and processed commodities such as fish, dairy and other meats, driven primarily by increasing per capita incomes (Bennet's Law) and as some would emphasize urbanization and associated lifestyle changes²⁴. This has been documented extensively (Regmi 2001; Kumar 1998 for India, Huang and David 1993; Wu, 1999).

While changing demand patterns are altering production patterns in agriculture in several developing countries, this also opens up greater opportunities for trade, made

²⁴ Reardon and Barrett (2000) also suggest that increasing female participation in labour force increase the demand for processed and prepared foods.

possible by advancing technology in processing and transport as also greater trade liberalization. Reflecting this basic demand shift is the expansion of trade in high-value food products at rates faster than traditional agricultural commodities²⁵. It is precisely this feature that is seen as an opportunity for developing countries to venture into processed food exports in a big way (Athukorala and Sen 1998)²⁶. Indeed, fish exports from developing countries to developed country markets now often exceed the combined value of net exports of coffee, tea, cocoa, bananas and sugar (Delgado, Minot and Wada, 2001). Also, trade expansion in fish and poultry has outpaced growth in production.

More importantly, these trends have been recognized as an important opportunity for the smallholder to participate in high-value agriculture and gain from growing trade (Delgado 1998). In particular, there is now much scope for peri-urban production of high-value agricultural commodities. It maybe too early to see how exactly these meta-trends have affected the smallholder except that it offers both an opportunity and a challenge.

²⁵Indeed, Cranfield et al. (1998) show that income effects on food consumption have contributed significantly to the changing structure of world trade. Using a GTAP model, they observe that the largest shift in trade occurs in developed countries (in favour of processed foods) and Asia's NIC (newly industrialized countries). In most other countries, like China, the dramatic shift in consumption patterns domestically has not translated into external trade, at least not yet.

²⁶ The role played by general trade and macroeconomic policies in agro-industrial exports of developing countries is elaborated in Diaz-Bonilla and Reca, 1999.

FOREIGN DIRECT INVESTMENT AND CHANGING STRUCTURE OF THE FOOD INDUSTRY

Even as these meta-trends influence the food industry in developing countries changing the structure of food industry, globalization has had a more direct influence through FDI²⁷. Traditionally, countries tended to see foreign investment as an infringement of national sovereignty. With more open policies with respect to foreign investment, FDI inflows have influenced pace and nature of agro-industrialization (Gopinath and Bolling 2000). There is a corresponding (and reinforcing) push factor too at work: With saturation of developed country markets and limits to expansion imposed by regulatory constraints (such as anti-trust laws), developed country food businesses see foreign investments as a promising strategy to expand operations. This has been particularly true of wholesaling and retailing firms (see Handy et al 1996 for a discussion on the US food industry). While initially transnational investment confined itself to developed countries, developing countries are increasingly seen as promising destinations – they now represent one-quarter of US firms' FDI in food processing globally.

FDI are double-edged – where they are in the form of fresh investments, they serve to generate employment and income to the extent that they do not put domestic firms out of business. Even when they are essentially takeovers of existing firms, they remove capital constraints for domestic agro-industrial firms (as in Malaysia, Argentina and Slovakia; Gopinath and Bolling, 2000; Gow et al 2000), and result in transfer of

²⁷ Some interesting issues regarding trends in the food industry are addressed in Josling (2000).

technology or in spurring innovation (Wei and Cacho, 2000 elaborate on the Chinese experience).

However, FDIs could also result in concentration of global market power and repatriation of profits. This increasing concentration of market power at all levels, processing, trading, wholesaling and retailing has been happening for sometime in the developed countries and is rather well documented (See for instance Handy et al 1996)²⁸.

What is interesting however is that this phenomenon is not unique to developed countries. Recent research shows that Latin America has seen a dramatic change in this sphere. In the 1990s, the share of retail sector controlled by supermarkets increased from 20% to 80%, in Central America this figure was between 20 and 35%. In Brazil, the top 10 supermarkets control an increasing proportion of retail trade – from 23% in 1994 to 44% in 1999, while in Central America a single firm controls 60% of chicken purchases (See also Reardon and Berdegue 2002²⁹). The Thai conglomerate CP is an excellent illustration of this (Goss et al 1999).

What are the implications for small farmers?

The main concern here is that with greater concentration and cross-country consolidation, increasingly, firms are going in for worldwide or region-wide strategies (as for MERCOSUR, Jank, et al, 2000). In the context, international procurement could

²⁸ In fact this trend is so prominent that it has even merited literature on the interplay of competition policy and agricultural trade policy (MacLaren and Josling, 2000).

²⁹ Reardon and Berdegue (2002) point out that in 2000 roughly 60% of national retail sectors in Latin America and Mexico was controlled by supermarkets and have become the main players in the supply chain particularly in dairy, fruits and vegetables and value-added foods.

increasingly displace local procurement and small farmers could be elbowed out (See Reardon and Berdegue 2002 for discussion on policy options).

However, assessments of how smallholders might be affected by such concentration depend on the following factors (Reardon and Barrett 2000). *First*, there may be organizational and institutional structures that explicitly include (and promote) smallholder participation (clustering, cooperatives, private management companies). *Second*, higher capital labour ratios in producing industries may not necessarily augur ill for the smallholder, particularly if access to external or expansion in domestic markets engineers large increases in output and thereby employment. *Third*, in developing countries, where cheap labour is crucial to global competitiveness, agro industries might choose to maintain high labour-output ratios that have positive impact on employment.

With concentration and growing scale of agri-food businesses, vertical coordination or integration is increasingly regarded as key to successful participation by smallholders, particularly in high-value agriculture. While such vertical integration is desirable, there is concern that even vertically integrated or co-ordinated ‘demand chain’ might be exclusionary vis-à-vis the small farmers, with buyers contracting with larger farms or firms that can meet their demands with lower transactions costs and risks. Studies suggest that whether the smallholder is involved and benefits from contractual ties with the agro-industry tends to be situation-specific and highly variant with no inherent bias in either direction (See Appendix 1).

To ensure that these institutional arrangements are indeed beneficial to smallholders, studies point to the need for a referee – a role that can be played by independent regulatory bodies or arms of the state or civil society (Vorley and Berdegue,

2001). Also, governments could play an important role to foster smallholder participation in the food industry by providing the necessary asset base, infrastructure etc. to reduce high transactions cost that constrain them (Holloway et al 2000, Delgado 1998, Escobal et al, 2000) alongside an appropriate legislative framework and a credible enforcement mechanism.

The other set of issues that must be addressed is the effect of emergence of agro-industries on aggregate employment, rather than a narrow focus on its sourcing of produce. As mentioned above neither an increasing capital intensity, nor emergence of large-scale agri-businesses have any inherent anti-smallholder bias if they generate positive net gains in employment. It would be useful, in that case, for policy makers to provide an enabling environment for growth of agro-industries.

FOOD SAFETY CONCERNS AND QUALITY STANDARDS

The emergence of standards can be attributed to two broad trends. *First*, imposition of product quality and safety standards by the food industry on farmers has emerged in response to consumer perceptions of food quality and safety particularly in developed countries. This trend is however increasingly apparent in developing countries as well (Farina & Reardon 2000 for MERCOSUR). *Second*, the signing of the Agreement on SPS measures as part of the Uruguay Round has catapulted food safety issues into the

limelight³⁰. It affects developing countries in 2 ways – First, it may be difficult for developing countries to prevent imports that don't meet domestic SPS standards because of weak institutions, legislation and enforcement. Smallholders may have to contend with that. Second, and more problematic is: given that SPS standards of developed countries are very high, how can small farmers (a) meet the standards given that some of these standards entail costlier production process and methods of production and (b) prove that the standards have been met. And in the face of unreasonably stringent SPS standards that are used as non-tariff barriers to trade, what are the chances that the smallholder has recourse to dispute settlement mechanisms?

There seems to be unanimous agreement that SPS standards in developed countries do pose major constraints to developing country exports³¹ (Annexe Table 2) – interestingly particularly so in high-value commodities and fresh food products, which are seen as key areas for smallholder participation.

³⁰ Broader issues on SPS get excellent treatment in Jensen (2002), which offers a developing country perspective of the agreement, Josling (1997) of measuring the impact and Bureau et al (1999) of trade considerations and SPS. See Henson et al (2001), which surveys developing countries to identify problems in coping with SPS standards and the issue of developing countries' ability to participate in setting international standards, which are equally important.

³¹ Thailand for instance had been involved in 21 SPS disputes with her trading partners since 1995. Similarly, the loss from a 1997 ban by EU on shrimp exports from Bangladesh was estimated to be US\$14.6 million (35% of the export earnings from shrimp in 1996; Cato and Don Santos, 1998). A set of studies (Wilson and Otsuki, 2002; Wilson and Otsuki, 2001 and Otsuki, Wilson and Sewadah use econometric methods (more specifically a gravity model) to generate outcomes of SPS regulation in developed countries on developing country exports. They find for instance, that the new EU standard for aflatoxin in food imports (as against the less stringent international standard), which reduces health risks by about 1.4 deaths per billion per year, would reduce African food exports to EU by 64% (or US\$ 670 million). Mutasa and Nyamandi (1998) find that close to 3/5ths of the countries that responded to a survey, indicated that some exports had been rejected within the previous two years due to failure to comply with importer-standards because of contamination – microbiological and otherwise – and spoilage.

In contrast, there is as yet little evidence on costs of compliance with standards or how it constrains the small farmer from participating in global trade. One study suggests that in Kenya and Zimbabwe, whereas in 1992, close to 75% of fruit and vegetables were grown by smallholders by 1998, four of the largest exporters sourced only 18% of produce from smallholders (Dolan & Humphrey, 2000). In Zimbabwe, the five largest exporters sourced even less (only 5%) from smallholders. However, it is also true that in these countries *there have been instances where smallholders meet quality requirements* of the UK market. In both cases, exporters are known to have been responsible for organizing growers, arranging finance, providing technical support and ensuring traceability. The role of the exporter is important since supermarkets in the UK tend to prefer concentrating their grower base and reducing risks rather than sourcing from small farmers themselves (Dolan and Humphrey, 2000).

The main problems facing producers in developing countries appear to be that technology, sanitary facilities and processes and trained manpower often do not keep pace with the rapid growth of exports and inspection procedures are often ineffective since facilities are limited (Cato and Santos 1998). As a result, in many cases detentions were often on account of basic types of food contamination (by insects, rodent filth and microbiological) rather than highly technical or sophisticated requirements (FAO 1999). Other factors that act as constraints include lack of information on SPS regulations, limited reaction time to alter production processes in response to SPS notifications, fragmented standards, lack of expertise, etc.

While the FAO suggests that dealing with such problems is well within the means of developing countries, Mutasa and Nyamandi (1998) suggest that financial and technical

support for establishing testing and inspection facilities must be provided in exporting countries. Finger and Schuler (2000) suggest that given the financial constraints faced by developing countries and the past experience of the World Bank in building capabilities in this area, the financial resource requirement could equal the annual development budget for most developing and transition economies

Annexe Table 2—Food Safety Concerns & Quality Standards: A Summary of Selected Studies

Study	Approach	Findings: Do Food Safety and Quality Standards Hurt Developing Countries/ Smallholders?		Remarks & Conclusions
		No	Yes	
Wilson & Otsuki (2002); Wilson & Otsuki (2001); Otsuki, Wilson & Sewadah (2001)	Data-based approach. Use a gravity model to measure impact of new EU aflatoxin standard on food imports; pesticide residue limits for bananas in OECD countries.		<ul style="list-style-type: none"> - These more stringent aflatoxin standards would reduce African food exports to EU by 64% (US\$ 670 million). - Similarly, if pesticide residue limits (chlorpyrifos) in bananas are made more stringent by 10% it leads to a 14.8% reduction in exports from Asia, Africa and Latin America. - Also shows that fragmented standards are expensive for developing country exporters. 	These studies do not focus on smallholders.
Muata & Nyamandi (1998)	Data based study on rejections of agri-food exports by importing countries		Close to 3/5 th of countries who responded to a survey had some exports rejected in developed countries due to contamination and spoilage.	These studies do not focus on smallholders
Cato and Don Santos (1998)	Qualitative study on Bangladesh		Supply side constraints in meeting standards are significant. In Bangladesh, technology, sanitary facilities and processes as also trained manpower did not keep pace with export growth in shrimps. Testing centers and inspection facilities limited.	Emphasizes supply side constraints: processing, certification and testing, etc. Possible role for public sector.
Unneher (1999) Unnehever & Hirschhorn (2000)	Qualitative Approach. Case Studies of SPS problems for developing country exporters and how they have been overcome.	Countries have succeeded in meeting food standards (ex. Bangladesh & Guatemala). The key is to have vertical coordination with private sector and an active government that provides necessary market information, etc.		Vertical Coordination, pro-active government to provide the necessary infrastructure and initial impetus.
Dolan & Humphrey (2000)	Qualitative Approach Global Commodity Chain analysis to see how standards in UK supermarkets and retailers affect horticultural industry in Sub-Saharan Africa		Sourcing from smallholders on the decline. But where smallholders have been successful, they have linked up with exporters who provide credit, and oversee production standards etc.	Vertical Coordination may be the solution.

Annexe Table 3—Institutional Innovations—Contract Farming, Clustering and Cooperation: A Summary of Selected Studies

Study	Region & Scope	Findings: Have Institutional Innovations been inimical to smallholder interests?		Ambiguous
		No	Yes	
Escobar et al (2000)	Analyzes endogenous change in rural private institutions and agro-industrialization in coastal Peru and its impact on small farmers			Contacts favoured large farmers. However formation of “farmer companies” by small cotton farmers and their linking up with a management company included small farmers explicitly. Ambiguous impact on employment and incomes.
Holloway et al (2000)	Data-based study of dairy cooperatives in East African highlands	Milk groups do increase smallholder participation in fluid milk markets in Ethiopia but would be even better if accompanied by policies targeted at investment in infrastructure, knowledge and asset accumulation within the households.		
Warning & Key (2002)	Study of Contract Farming of confectionary peanuts in Senegal	Small farmers are involved. No bias favouring wealthy farmers; reputation and perceived honesty more important. Also, contract farming significantly increased incomes of small farmers.		
Carney & Watts (1990)	Contract farming in Africa		Contract farming tended to disrupt power relations within farm households – between male heads of household and their wives and children.	
Kirk (1987)	Virginia tobacco contract farming in Sri Lanka		A hierarchical structure of company-barnowners (who cured tobacco)-subgrowers (typically small farmers) left more power with the companies who could draw terms of contract in their favour. No forum to address grievances of sub-growers.	
Runsten & Key (1996)	Contract farming in tomatoes in Mexico	Though initially large farmers were contracted, small farmers were preferred		

			subsequently because with the former threat of renegeing and moral hazard was high, and it was difficult to enforce contracts. Smallholders were more likely not to do so since transactions cost to access markets on their own was too high and were faced with a severe credit constraint.		
Korovkin (1992)	Studied outgrower schemes in grapes in Chile			Outgrower schemes sharpened the difference between rich and poor peasants. Some became peasant capitalists while latter often became seasonal wage labourers with unstable incomes.	
Nankumba & Kalua(1989)	State run contract farming schemes in Malawi for sugar (Smallholder Sugar Authority) and tea (Smallholder Tea Authority)			Bias against smallholders. However this was mainly because of crop characteristics (complex technology, specialized inputs, large capital outlays, high risk and presence of scale economies).	
Key & Runsten (1999)	Frigozadas la Huera Aguasalientes		In the scheme as against 10 large farmers, there were 70 small farmers involves. Firm reduced transactions costs in dealing with the latter by choosing small farmers along the highway. Many family members of farmers were employed in other capacities which reduced asymmetric information but also interlinked labour-product transactions.		
Runsten & Key (1996)	Frozen Vegetables Contract Farming in Mexico		Smallholders were included but only out of necessity. Large growers often colluded to bid up prices, they couldn't supply all that was requires and particularly for vegetables like cucumbers, which was labour intensive, contracting with small farmers was suitable.		

<p>Bauman (2000) Ghee and Dorral (1992)</p>	<p>Contract farming of palm in Malaysia by the public sector.</p>	<p>Allocated 4 hectares each under the system, contract farming increased farmers incomes. The long waiting list of applicants and the annual economic return of 20% suggests the system is mutually beneficial.</p>		
<p>Bauman (2000) Daddish</p>	<p>Evaluates contract farming scheme for oil palm in Ghana</p>	<p>Smallholders were involved in both countries. However, in Ghana, they had more political power. Here, small farmers formed an association called SHAK that raised production-related matters, need for seedlings, timely collection and proper weighing. They also took up questions of food availability. In the Ivory Coast, rather than collective strength small farmers responded in individual forms – like diverting production to the open market, etc.</p>		
<p>Bauman (2000) CDC (1989)</p>	<p>Evaluates contract farming in the Ivory Coast</p>			

Either way, it is not clear at all that the smallholder would have either the financial capacity or access to institutions that would enable them to export high-value products to developing countries in the face of high standards. It is also inconceivable that the smallholders in developing countries could tap technical, scientific and legal capacity in these developing countries to voice these issues in national and international fora, let alone defend or initiate dispute cases that are so dominant a vehicle for resolving these SPS issues.

The solutions for the small farmer are as before recognized as lying in *vertical coordination*. Different models exist – MNCs which tightly control production for export to high-income markets (vegetables in Kenya for UK markets), contracting with larger firms, small farmers coordinated by exporting firms that provide guidelines for meeting these standards (as is the case of fruits cultivation in the Ivory Coast for the EU market), or production being contracted to small farmers by the larger agro-processing firms. Each of these raises issues that have been elaborated in the previous section on institutional innovations on the firm-farm interface.

The *role of the public sector and international cooperation* assumes critical importance here. Testing, certifying qualities or regulation through HACCP procedures, securing pre-certification for exports through in-country inspection by importing countries are areas where the public sector is important. Empowering small farmer groups to adopt production practices that help meet standards are important as well. Some examples of overcoming SPS barriers – the case of shrimp exports from Bangladesh, snow peas from Guatemala (Unnehver, 1999 citing Sullivan et al 1999), and fish exports

from India – demonstrate that public sector and international agencies can play a dynamic role in assisting exporters meet food safety standards (Boxes 8, 9 & 10). This has also been true more generally of high value exports as the case of China’s cut-flowers demonstrates (Box 10).

Box 8—Bangladesh: Fish Exports

Small-scale fish farmers form the backbone of Bangladesh’s aquaculture industry which is the second largest source of foreign exchange earnings (US\$ 360 billion in 2000) after garments. Aquaculture farms are linked to these small-scale shrimp collectors through a network of middlemen for supply of live wild juvenile prawns etc. that are then bred in water bodies. They are in turn linked to export processors or other commercial processors.

One of the instances of international cooperation is the “Export Promotion of Value-Added Fishery Products and their Sustainable Development” a project co-financed by the Common Fund for Commodities (CFC), International Fund for Agricultural Development (IFAD), INFOFISH, the FAO and participating Bangladeshi firms. Through a multi-pronged capacity-building program aimed at enhancing value-added production for lucrative markets, the project trained about 329 people in value-added production and quality standards (i.e. HACCP procedures). Importantly, following the EU ban in 1997 on Bangladeshi seafood due to sanitary reasons, the project played a key role in upgrading 5 of the 7 participating companies to EU standards. This was in addition to promotion of private sector investment in processing facilities and transfer of know-how. Most importantly, the project succeeded in integrating small-scale exporters into the international network of seafood processor exporters. In India, a similar story happened where following a ban on fish exports in 1997, industry upgraded its facilities so that by 1991 there were as many as 121 world-class plants in operation.

This is a promising example of how private industry in conjunction with international cooperative effort, can go a long way in strengthening capabilities in sectors where smallholder participation is significant most significantly to tackle the challenges of globalization.

Source: Subasinghe.S (2001) Promotion of Export Processing of Value-Added Fishery Products from Bangladesh: A Success Story of an Integrated Project.

Box 9—Guatemala: Snow Pea Exports

During 1984-94, over 3000 Guatemalan shipments of snow peas worth over US\$18 million were detained and/or rejected at US ports for chemical residue violations. This was because producers used chemical means to control disease and insects. In 1995, leaf miner crisis led to a USDA Plant Protection Quarantine for all Guatemalan snow pea shipments.

At this stage, the Government of Guatemala with the help of USAID sponsored research eventually established that the leaf miner was not exotic to the US and therefore did not pose a threat to US producers. Control strategies to reduce chemical overuse too were recommended. Consequently, integrated pest management (IPM) techniques lowered rejection rates of shipments, while in 1997, the PPQ was withdrawn re-establishing an annual US\$ 35 million market.

The importance of this story lies in the fact that without proactive government support (and international financial assistance) small farmers with limited means, organization and access to scientific skills may have not had the ability to fashion a similarly happy ending.

Source: Unnevehr & Hirschhorn (2000) Food Safety Issues in the Developing World, World Bank Technical Paper No.469

Box 10—Success Stories in International Cooperation - China Cut Flowers

The Yunnan province in China has traditionally been called the Tobacco Kingdom – named for its predominant crop. In 1996, the local government launched a program to provide an alternative to the increasingly uncertain tobacco industry – a high-tech bio-resources industry by 2010. Cut flowers was one of 18 products supported under this program.

With growing prosperity associated with cut flower production, as many as 291 enterprises and over 10,000 household farmers are engaged in flower production in the Yunnan province alone and many transnational joint ventures. Despite its visible success, Yunnan was not as successful in tapping international markets (exports were only 10% of production in 1999) due to (1) lack of organized marketing system (2) inadequate support infrastructure and (3) insufficient number of farmers capable of exporting flowers.

This is where the technical cooperation arm of the UNCTAD and WTO came in, which provided technical training to build human resources. A special task force was set up to study the world markets and prospects for Yunnan cut flowers, to identify the provinces' strengths and weaknesses etc. and prepare an export strategy. A central flower auction market based on the Dutch model was recognized as essential. It would also select a group of 8 flower growers or enterprises to serve as models, and initiate services such as the ITC weekly Market News, etc. In recent years, Yunnan's exports of cut flowers has witnessed a considerable increase particularly to other Asian countries such as Japan, Korea, Hong Kong, Thailand etc.

This is an example of how the public and private sector could work together with international inputs in the form of technical assistance to enable farmers in developing countries diversify and exploit opportunities opened up by trade.

Source: Xuejun Jiang "Cut Flowers in Yunnan Province of China: ITC Experience in Technical Cooperation for Export Diversification."

Experience so far thus suggests that while private sector role and high degree of vertical integration has been instrumental in successful export production, while Government assistance in providing necessary infrastructure market information, research and testing and certification was important too (Unnehver and Hirschhorn, 2000). Even while emphasizing the role of international agreements like the SPS and TBT, it is important not to underestimate domestic forces that have precisely the same effect. In several developing countries, urban consumers are becoming increasingly

conscious about food safety and attributes such as organic cultivation, etc. These can only become more marked in future and would have similar implications for small farmers.

To sum up the evidence on other global drivers and meta-trends, it is apparent they pose a big challenge to small farmers, ironically, precisely in areas that offer them greatest opportunity – namely high-value agriculture. However, there are also clear indications that these challenges can be met and where they have been met, it has usually been through a combination of (1) vertical coordination with processors and agro-industry and (2) a pro-active public sector or government (whether in research, or establishing certifying and testing procedures).

6. WHAT DO WE LEARN FROM THE LITERATURE REVIEW?

Following the extensive overview of literature pertaining to various factors that impinge on smallholders, it is now time to see what we can learn from this – in terms of which methods offer greatest insight, what areas would need research to further our understanding, and most importantly what do the findings of these studies imply for policies.

OBSERVATIONS ON METHODS AND APPROACHES

Even at the outset, it was emphasized that given the various and complex dimensions of smallholders' new context, any attempt to answer the question would have to factor in as many aspects of the problem as possible – this would include not only price changes induced by trade liberalization but also changes being engineered by other

global drivers and meta-trends. Understandably, so far, *no study reviewed has been so comprehensive as to cover the whole canvas of issues*. It is evident that studies on different aspects of globalization and the smallholder have various foci, use diverse approaches with different points of departure. Their results are as mixed and varied as the methods they employ. *Even those studies that focus on a small subset of issues offer no consensus*.

An important feature that emerges is that *studies focusing on trade liberalization alone* (operating through price changes) *and those that address broader issues of globalization* (such as changing structure of food industry and new relationships in the interface of farm and firm, SPS issues, etc.) *have run somewhat parallel to each other where a greater integration of the two would be more valuable*. Methodological approaches may have something to do with this apparent dichotomy. Modeling, used so commonly in trade liberalization studies, has limited scope in capturing structural changes that typify broader issues of globalization. Most importantly however, given the context of this paper, the modeling approach tends to make some “killer assumptions”, tending to assume away critical factors such as institutional constraints, the global drivers and the meta-trends. As the review of studies shows, this is a grave problem, since increasingly global drivers other than trade liberalization and meta-trends (like SPS, IPRs, FDI in food industry) have become the factors to reckon with. Qualitative approaches, on the other hand, although useful to focus on particular aspects, fail to capture the net impact of the different changes in a rigorous way. In particular, those dealing with issues such as quality standards, technological change, etc. are usually

devoid of the context of price changes induced by trade liberalization. It seems that the *databased approach (or survey based approach), in conjunction with qualitative studies, offer best scope to assess the predicate of the smallholder.*

Apart from greater integration of the two streams of literature, there are several areas, which are significantly under-researched, that deserve attention. These include the implications of IPR (particularly changing structure of the seed industry), compliance costs of SPS, implications of different kinds of technological advances, concentration of food-related industry and their implications for smallholders. In particular, it would be useful to have rigorous databased evidence of impact on smallholders in this area.

Finally, another thing that emerges from the review is that almost all the studies that have been reviewed, address smallholders often only peripherally in discussions of larger issues such as technological change, trade liberalization or food safety and quality standards. It would be useful instead to allow smallholders to be the *subject* of their own story and view changes relating to globalization from their point of view. Only then is it possible to identify which factors are likely to have greatest impact, and how these different forces *collectively* impact on smallholders (Figure 2). This is really the key to understanding how globalization affects smallholders and what policy options are available to deal with the issue.

WHO ARE THE WINNERS? WHO ARE THE LOSERS?

Returning now to the all-important question: Can smallholders ride the wave of globalization or will they be swept away? What has been the experience so far? Who are the losers and who are the winners?

Overall, from the literature reviewed, it is apparent that trade liberalization could adversely affect particular crop sectors in particular countries rather severely, as the prognosis for corn in the Philippines and Mexico and rice in Malaysia suggests. To generalize, smallholders who are net-sellers in the inefficient sectors (or those where the country does not have competitive advantage given the trade environment, and other non-price factors) invariably lose, while net-buyer smallholders in efficient sectors in exporting countries face similarly adverse circumstances. The centrifugal forces at work would push smallholders out of these affected sectors leaving them with two options – leave agriculture altogether or shift to other crop sectors. Their choices outside of agriculture are often determined exogenously while deteriorating environmental conditions and the limited productivity gains in some resource poor regions, offers a limited range of options in terms of cropping pattern shifts. What options do they then have?

It appears that for smallholders in developing countries, *high-value agriculture for exports and increasingly for urban domestic markets too* offers a great opportunity. In particular, because they are often labour intensive and are quite suitable for marginal lands (as for poultry, etc.). Smallholders who are able to successfully switch to high value agriculture would, it seems, gain substantially from globalization. Indeed, all over, there

have been instances of small farmers benefiting from such exports to other countries or even other regions within the country (cut flowers from China, fish from Bangladesh, horticulture from Kenya and Zimbabwe, etc.).

- It is instructive that in all these cases, the winners have been those smallholders
- (1) who are vertically integrated with agri-businesses (exporters or otherwise) or have devised institutional innovations (such as cooperatives or farmer companies) for collective strength;
 - (2) having access to better physical infrastructure and credit; and
 - (3) have benefited from role played by public sector, private industry or international cooperation in capacity building

On the other hand, there are also those who have failed to capitalize on the opportunities opened up by globalization or have been adversely affected. Despite the diversity in the methods, approach and orientation of different studies, there seems to be clear indication that these smallholders in developing countries are those who

- (1) are poorly endowed in terms of natural resources, assets, and infrastructure
- (2) lack access to markets for output, input, land, as also credit and insurance, and
- (3) have limited alternatives for employment (off-farm) in rural and urban areas – in agro-industries or otherwise.

WHERE HAVE SMALLHOLDERS BENEFITED MORE – AFRICA, ASIA OR LATIN AMERICA?

While each region has its winners and losers, it also emerges that there are some broad differences between regions. While an examination of the evidence does not reflect if smallholders in one region are unequivocally better off than in others, what is evident is that each region is distinguishable by a unique combination of constraints so that it shapes the way smallholders are negotiating their new context.

In **Africa**, the major roadblocks are *structural and institutional constraints*. These seem to have driven the farmers to subsistence in several parts – as Barrett's immiserized growth in Madagascar suggests, and therefore unable to exploit opportunities for trade where it exists – as Jayne points out for Zimbabwe. Apart from the sheer magnitude of transport and marketing costs, other constraints like credit, access to insurance, inputs, skill base, etc. are also problems to varying degree. Indeed, much of the literature that discusses these constraints pertains to Africa. Also interesting is the finding that smallholder income in Africa is highly diverse which suggests that there may be *push* factors at work. Smallholders turn to rural non-farm employment as risk-coping strategies or ex-post management of shocks (Barrett, Reardon & Webb, 2001). Regarding other factors of globalization, there is not much evidence that the pace of agro-industrialization has been significant to merit special attention. However, food safety and quality, particularly in European markets has been something of an issue since it holds great potential for African horticultural exports. Evidence on smallholder participation in high-value agriculture indicates that smallholder participation has been heartening (Kenya and

Zimbabwe) in some cases. Much of this has been due to vertical integration of smallholders with agri-exporters.

Asia, particularly South-east Asia, is much better endowed with infrastructure and some successful examples of smallholder-friendly institutions – like microfinance and other informal and formal lending mechanisms in Bangladesh, Thailand and Indonesia, dairy cooperatives in India etc. – as also higher levels of human development. Partly because of these factors, several countries in Asia, mainly in South-east Asia (Thailand, Viet Nam, etc.) but also in South Asia (Bangladesh, India) have been able to exploit opportunities opened up by export liberalization and the growing demand in high-value agriculture such as fish and poultry and have been successful in adapting to the requirements posed by a new global trading environment. Here, the concern is whether agro-industrialization, particularly those serving export markets has been sufficiently inclusive vis-à-vis small farmers. There are indications that in Bangladesh’s fish industry, small farmers are an important part, as is the case in China’s cut flower exports. It is essential to study further the systems that have worked well so that these best practices can be adopted on a wider scale.

A distinguishing feature of smallholders in several Asian countries seems to be the greater dependence on *on-farm employment* (agricultural wages) and *seasonal migration* to urban centres (China, India, Thailand, etc.) as against rural non-farm employment, than in Africa or Latin America. In fact in Latin America and Africa, farm wage labour is something of a “refuge job”. It could well be that in Asia, given the link between agricultural prices and wages, higher prices of commodities like rice post-export

liberalization have buoyed up wages, making it attractive for smallholders to also supply labour on the farm. There is some evidence that migration to urban centres occurs primarily from poor but not poorly endowed agricultural regions (as in migrants from Bihar into Delhi) which is reflective of push factors. In several other cases, it is the attractive wages and perceived employment opportunities that pull in migrants (China). In the former, it would be essential to focus on agricultural development (including infrastructure, credit etc.) itself in such problem-areas. It would nevertheless be useful to focus on why rural non-farm employment in Asia is not as important and if special attention needs to be devoted to performance of this sector.

The other important constraints in Asia seem to be *credit and price risk management institutions*. However, this area has been attracting a lot of attention from policy makers and several instruments are being devised and operationalized to tackle this. Much success has been reported by different schemes (the kisan credit card in India, microfinance in Bangladesh, etc.) in alleviating credit constraints. This may be the path to greater success in smallholder agriculture.

Latin America appears to be somewhat different from Africa and Asia. Rural population and poverty are at much lower levels and most also having access to better physical infrastructure. As far as institutional and structural constraints are concerned, Latin America has been ahead of Asia and Africa in experimenting with schemes designed to provide insurance against risks (like warehouse receipts systems) have well-functioning commodity exchanges etc. To that extent smallholders access to such institutions appears to be relatively better. Perhaps the chief distinguishing feature is that

agro-industrialization proceeded at a much faster pace and much earlier in Latin America than elsewhere, notably in countries such as Brazil, Argentina and Chile. This seems to have generated some positive employment effects or at least non-farm alternatives in very poor regions (Barron & Rello Mexico tomato agro-industry). Evidence on arrangements such as contract farming, cooperatives and farmer companies is less clear. Despite hiccups, some have worked reasonably well for small farmers, though sometimes by sheer circumstance. In Latin America too as in Africa, a lion's share of rural household income comes from the rural non-farm sector. It is however noteworthy that it is the *pull* factor that seems to be at work here rather than the push factor. Self-employment or jobs in the services sector (including input provision, transport and related services) seem to be important in many countries in Latin America. However, here too, the poorer farm households are no different from their counterparts in Africa and may be responding to push factors when they diversify their sources of income.

WHAT ARE THE POLICY IMPLICATIONS? SOME TENTATIVE CONCLUSIONS

The broad findings that come out of review of literature have some important policy implications. In the context of smallholders in a globalizing world, policies would have to address two related objectives (1) to enable smallholders take advantage of opportunities where there are constraints preventing them from doing so and (2) to deal with and minimize the adverse impact, where smallholders are hurt in the globalization process. Towards achieving these two objectives, it would be useful to think of two broad groups of policy instruments: (1) Enabling factors, that help farmers ride the

globalization wave and (2) Coping factors, that protect them from being swept away.(Figure 3).

Enabling Factors

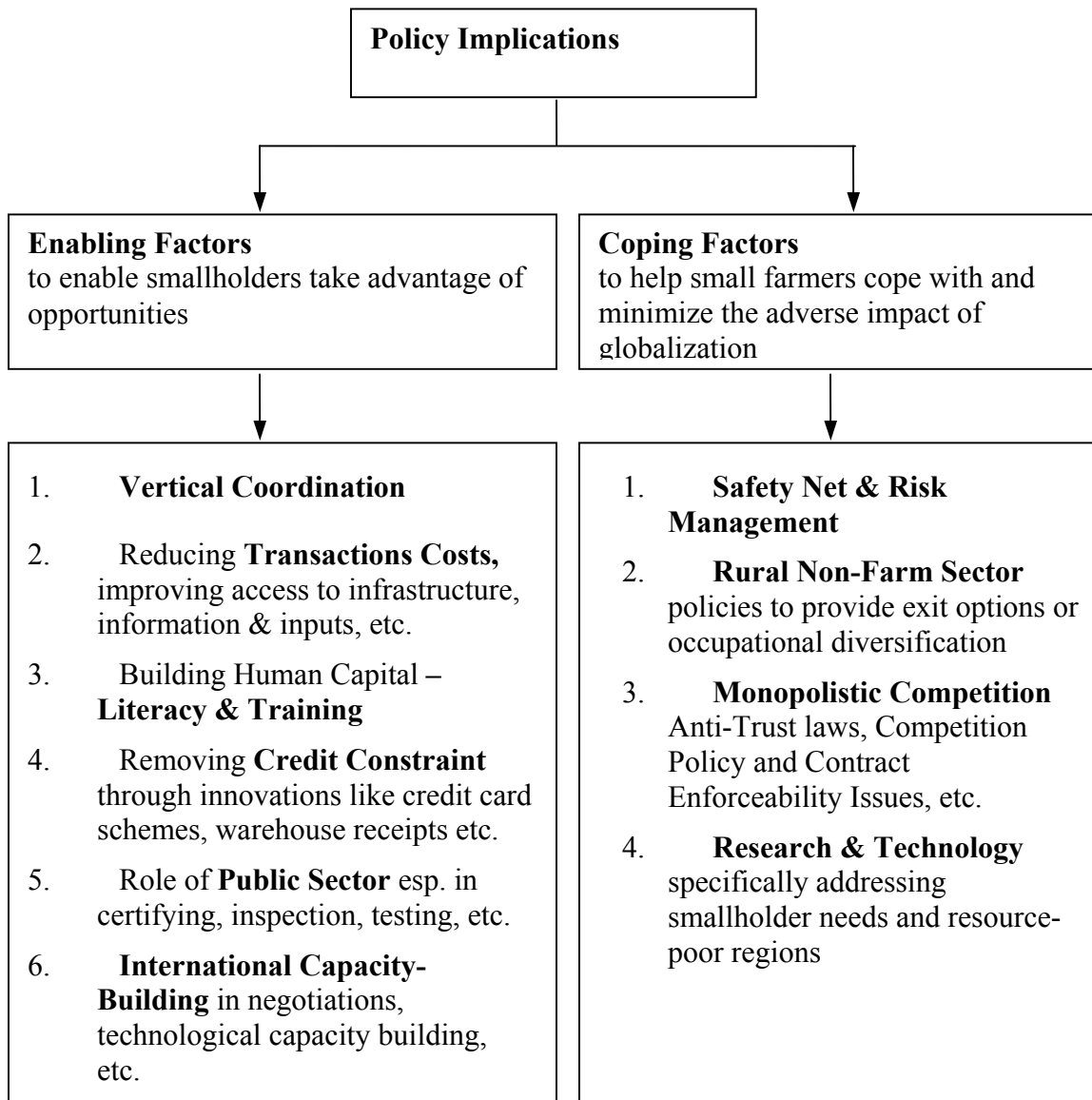
If smallholders are to ride the wave of globalization, it is evident that the many constraints they face are removed. Of these, the six areas that can be deemed critical, and therefore should be targeted by policy interventions are

1. Vertical Coordination
 2. Reducing Transactions Costs
 3. Building Human Capital – Literacy & Training
 4. Removing Credit Constraint
 5. A proactive Public Sector and
 6. International Capacity-Building
- Greater **vertical coordination** with agro-industry facilitates participation of small farmers in growing processed food trade, particularly in meeting food safety and quality standards. These can be achieved through institutional innovations such as cooperatives, contract farming and clustering. There is legitimate concern that the mechanisms of vertical coordination not always benefit smallholders. It is here that the state has an important role to play in areas of establishing appropriate legislative frameworks, contract enforceability, etc. Also, the initial establishment of such

relationships might require some coordination from the state or NGOs, in particular, in institutions such as cooperatives, and to ensure fair rules of the game.

- There is overwhelming evidence that **transactions costs** often prove so high that smallholders are unable to take advantage of opportunities to trade and instead retreat into subsistence. This would imply improving access to physical infrastructure, marketing institutions, information etc. and also removal of legislative constraints, etc.
- Among the more important findings is that often **credit** is the single most important constraint for small farmers. It has been found that sometimes credit constraints keep the farmer in the labour market. When this is addressed, returns to labour for small farmers increase. This has been recognized early enough and several innovative schemes, such as credit cards (India), livestock repos (Argentina), etc. have proved to be happy examples of success. However, this would have to be replicated on a far greater scale and in ways that are sustainable and situation-specific.

Figure 3—Policy Implications: A Two-pronged Approach



- Providing basic education and **literacy** would equip small farmers better with the skills required to take advantage of opportunities. In particular, adoption of

technology and participation in new institutional innovations would most likely be higher for literate farmers.

- Successful smallholder participation is also predicated on a **pro-active government and public sector**, that contributes in areas such as certification, inspection, testing, technology adoption in processing but also plays a role in fostering agro-industry and
- With globalization is implied a greater degree of interdependence between countries. It however, entails significant adjustment costs for developing countries, which are also financially less capable. Under the circumstances, it is desirable that there is a larger scale of **international capacity building** measures to enable developing countries to cope with the many challenges that globalization poses. This can occur at different levels:

Institution and infrastructure building: International role in enabling developing countries exploit opportunities opened up by trade have been important in the past. As the case of China's cut flower exports, Bangladesh's marine exports, etc. demonstrate international cooperation has contributed a great deal to capacity of these countries. A greater scale of such activities in partnership with national and local governments is essential particularly in the resource-poor backward regions, where private initiative is least likely to penetrate.

Political Empowerment: It would be essential to bring in a greater degree of representation of smallholder interests in the political decision-making processes.

International Negotiations: Finally at another level, it is essential to build capacity in developing countries to participate more in the process of globalization. This would involve more active involvement in the multilateral trade negotiations, and in decision-making processes of standard setting bodies (like the Codex, etc.). Only then can the concerns of smallholders be integrated into larger issues of globalization in a meaningful way.

Coping Factors

While enabling factors seek to act as facilitators for smallholders to take advantage of opportunities that globalization offers, there is also a need to have protective instruments that minimize the adverse impacts that inevitably accompany the globalization process. For small farmers, these boil down to

1. Availability of safety nets and risk-coping instruments
 2. Exit options, most importantly in the Rural Non-farm Sector
 3. Protection from monopolistic competition
 4. Technology that serves their needs
- Price volatility and more importantly persistence of low prices have surfaced as critical threats for small farmers. Given their low capital and resource base, it is important that smallholders have access to **price risk management instruments and safety nets**. Unlike the developed countries that can offer safety nets, developing countries' thin treasuries underscore the need to have other alternatives. There have been several successes in evolving schemes that help small farmers cope

with price risks ranging from commodity and futures exchanges to warehouse receipts system, etc. Several financial instruments act both as price-risk management instruments and as means of accessing credit. As far as safety nets are concerned, ensuring availability of food and the use of food coupons or stamps could be very important. Also, given that employment is the best safety net, complementary policies such as rural works or food for work programs would be necessary. All this would have to be complemented with border protection policies based on automatic triggers such as SSGs, price floors or price band systems etc. that are compatible with the WTO Agreement on Agriculture, since price crashes in international markets can wipe out the production base of smallholders fairly rapidly.

- It is apparent that **rural non-farm employment** is quite an important source of income for small farmers and where the push factors are severe, can provide a credible alternative. Greater attention to this sector in policy discussions is important. The rural non-farm sector is often an “orphaned sector” (Haggblade et al 2002) relegated to a policy “no-man’s land”. This would have to be redressed. This can be achieved through (a) overhauling financing of RNF activities (b) provision of infrastructure in rural areas, streamlining land legislations or other restrictive laws could so that agro-industries and other non-farm activities are promoted in rural areas (c) raising skills of small farmers so that they do not act as entry-barriers. Of these, educational attainment (Barrett), physical access to markets (Lanjouw et al for Tanzania, Smith et al in Uganda) etc. seem to be particularly important.

- Growing scale of operations and recent trends in mergers both globally and nationally draw attention to problems with **monopolistic competition** all along the agri-food chain. Under the circumstances, domestic policy and legislations (like anti-trust, etc.) may have to be established to govern monopolistic structures (this has been effectively used in the US to control retail mergers), but not so severe as to pose constraints to growth of the agri-business sector in the developing countries.
- **Technological research** geared to address specific small farmer is unlikely to be undertaken by private sector, and even in the public sector, political disempowerment could relegate these important issues to the periphery. There is a need for more focused research particularly with inexpensive, small-scale technologies, and for those in resource poor regions (typically unirrigated, rain-fed regions). It is also important to ensure the transfer of these technologies to small farmers, who may have problems gaining access to these technologies.

These coping policies would collectively ensure that the adverse impact of globalization is minimized.

While these two groups of policies can be broadly thought to address different objectives, they are in fact quite enmeshed with considerable overlap and complementarity. More often than not, both enabling and coping policies would have to operate in tandem and produce a *coupling effect* to address the problem in the most effective manner possible. Importantly, given the rapidity with which events associated with globalization can alter the landscape, it emphasizes the need for countries to have anticipatory or proactive policies rather than reactive policies. Needless to say, the

relative importance of different policy instruments would be different across regions. It is therefore critical to identify which battery of policies is appropriate depending on the unique circumstances of each region.

7. SUMMARY AND CONCLUDING REMARKS

This study had a four-fold objective: (i) to map the factors that would impinge on the smallholders in a globalizing world agriculture; (ii) to review and summarize the different approaches that have been used to gauge the impact of globalization on the smallholders as also the areas which have been under-researched; (iii) to distill the tentative conclusions that emerge from literature review regarding impact of globalization on the smallholders, and finally (iv) to spell out some policy options that can help smallholders ride the wave of globalization and not be swept away by its speed and reach.

This paper finds that studies that focus on trade liberalization alone (operating through price changes) and those that address broader issues of globalization (such as changing structure of food industry and new relationships in the interface of farm and firm, SPS issues, etc.) have run somewhat parallel to each other where a greater integration of the two would help us better to understand the full impact of globalization on the smallholders. This apparent dichotomy can be attributed partly to the difference in methodological approaches, with modeling being the preferred approach for trade liberalization studies and qualitative and databased approaches for studies on other global drivers and meta-trends. It seems that the databased approach (or survey based approach), in conjunction with qualitative studies, offer best scope to assess the predicate of the

smallholder. Importantly, it emerges from the review that barring a few areas such as short-term impact of price change, institutional and structural constraints, contractual relationships between farm and firm, the smallholder question has not attracted the attention it deserves.

An objective of this study was to find out from existing literature whether smallholders have benefited from the globalization process or have been adversely affected. Broadly it emerges that while some smallholders have succeeded in riding the wave of globalization, others have not yet been able to exploit opportunities opened up by globalization to the extent possible. And in fact, in many areas they have been adversely affected. Noteworthy is the difference across regions. Smallholders in Latin America appear to have had greater relative success in riding the globalization wave than have their counterparts in Africa and Asia. While acknowledging the significant differences even within regions, it is evident whether smallholders have benefited or have been hurt is determined by a fairly narrow range of issues. The search is then for policies that can successfully address these issues.

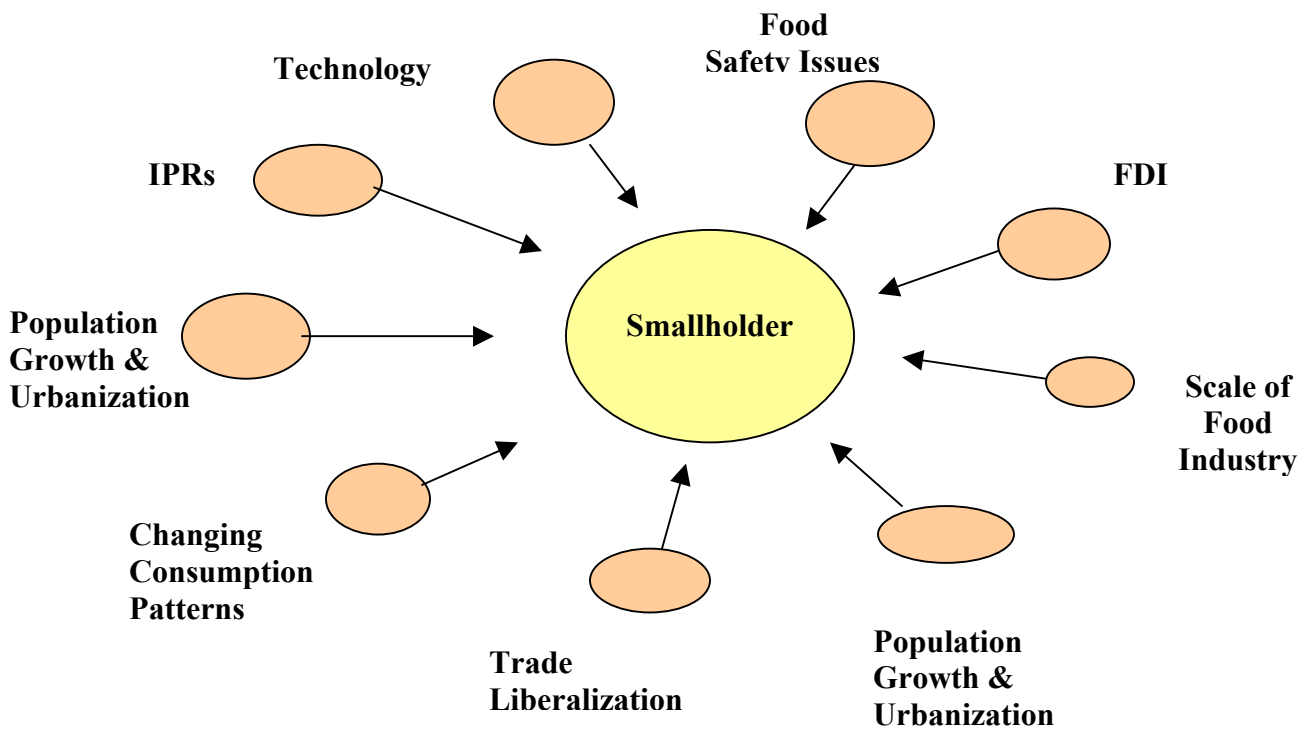
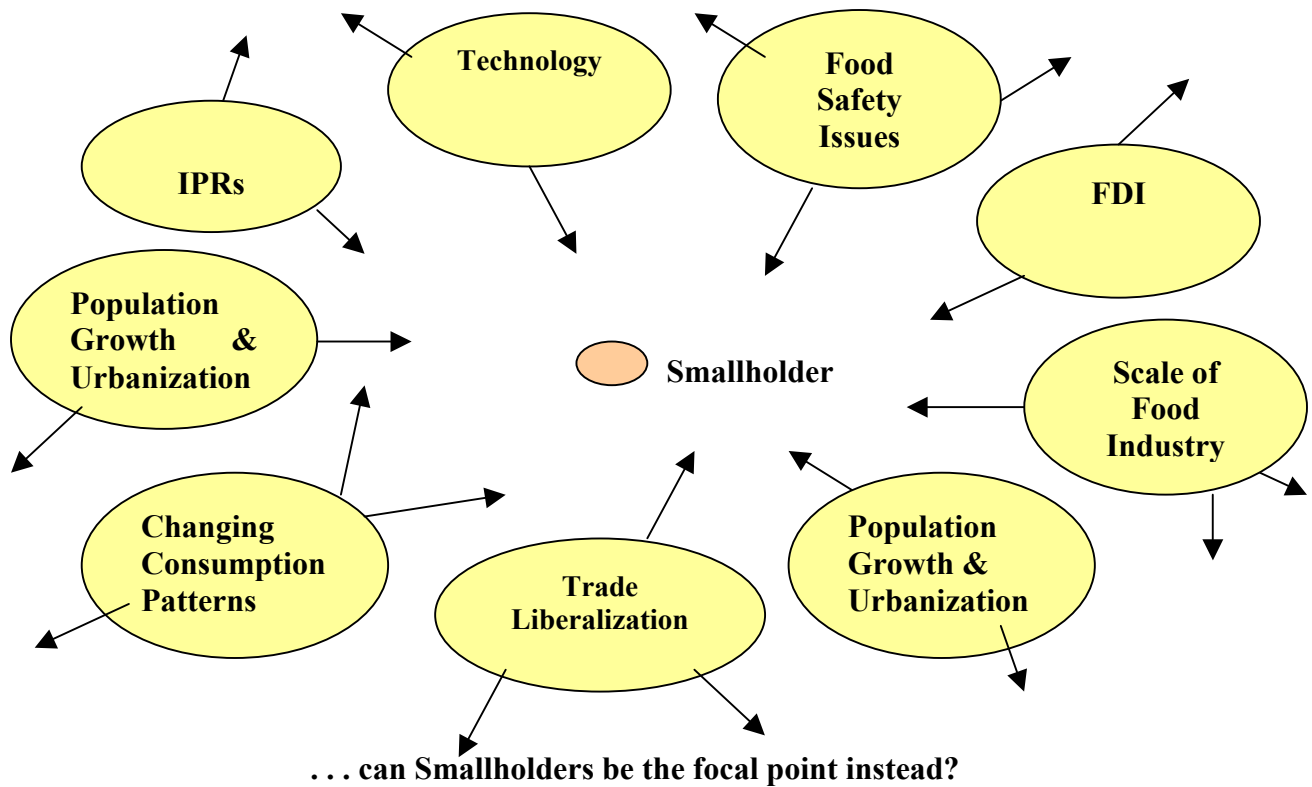
Based on this review, it emerges that policy interventions vis-à-vis smallholders should essentially have a twin focus (1) First, on removing the shackles that are currently constraining smallholders from exploiting opportunities that globalization presents and (2) Second, on ensuring minimum adverse impact. While the former can be accomplished through *enabling policies*, the latter would have to be tackled through *coping policies*.

The areas identified as critical *enabling factors* are greater vertical coordination, removing credit constraints, reducing transactions costs, building social capital, greater

role for public sector in providing infrastructure and facilitating institutions and also greater initiatives for international capacity building. On the other hand, *coping strategies* would include provision of credible safety nets and risk coping instruments, promoting exit options particularly through promotion of opportunities in the rural non-farm sector, guarding against harmful monopolistic competition, and focused research on technologies for small farmers.

Needless to say, the relative importance of each of these would be different in different regions. It is thus important to identify which battery of policies is appropriate depending on the unique circumstances of each region. To do that, it is essential to have a “smallholder point of view” and make smallholders the focal point, whereas they are currently lost in the waves (Figure 4). This is especially important because unless the factors impinging on smallholders are identified and anticipated correctly, and pre-emptive policies put in place, the rapidity of changes can in fact sweep away smallholders. In that context, it is imperative that lessons from the several success stories be drawn and replicated on a larger scale in an appropriate and meaningful way. Only then can small farmers make big gains from globalization.

Figure 4—Smallholders are currently lost in the waves . . .



REFERENCES

- Ahmad, Tengku Mohd Ariff Tengku (1998) Effect of trade liberalization on Agriculture in Malaysia: institutional and structural aspects. Bogor, Indonesia : CGPRT Centre, Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific, 1998.
- Ahmad, T. engku Mod Ariff Tengku Ahmad and Ariffin Tawang (not dated) “Evaluating the Effects of Trade Liberalization on Malaysian Agriculture with Emphasis on the Palm Oil and Paddy Sub-sectors.
- Ahmed, M. and C. Delgado. Introduction to the Issues and Context of Rapid Changes in World Demand for Fish.
- Akwabi-Ameyaw, K. 1997. Producer Cooperative Resettlement projects in Zimbabwe: lessons from a failed agricultural development strategy. *World Development* 25, 437-456.
- al Hassan R. 2000. Issues of response of rural producers to emerging markets for Africa’s processed cassava : The Case of Ghana. *International Food Agri-business Management Review*, Volume 2, Issues 3-4, Autumn-Winter 1999.
- Alwang, J., P.B.Siegel and S.L.Jorgensen. 1996. “Seeking Guidelines for Poverty Reduction in Rural Zambia”, *World Development*, 24 pages 1711-23
- Anderson, K. and R.Tyers.1989. Agricultural Trade Liberalization: Implications for Developing Countries. Paris, OECD.
- Anderson, S. ed. 2000. Views from the South: the effects of globalization and the WTO on Third World countries. *Chicago: Food First Books.International Forum on Globalization*, 2000.
- Athukorala P C and K. Sen. 1998. “Processed Food Exports from Developing Countries: Patterns and Determinants” *Food Policy* 23(1): 41-54, 1998.
- Bannister, G. and K. Thugge. 2001. International Trade and Poverty Alleviation “Finance and Development Vol 38 (December) No.4.
- Barnum H. and L. Squire.1979. A Model of an Agricultural Household, World Bank, Washington DC.

- Barrett, C. and P. Dorosh. 1996. Farmers' Welfare and Changing Food Prices: Nonparametric Evidence from Rice in Madagascar. *American Journal of Agricultural Economics*, 78 (August 1996): 656-669.
- Barron, M.A and F. Rello.2000. "The Impact of the Tomato agro-industry on the rural poor in Mexico, *Agricultural Economics* 23(3), September 2000.
- Barrett, C. 1998. Immiserized Growth in Liberalized Agriculture. *World Development* 26
- Barrett, C., T. Reardon and P. Webb.2001. Nonfarm income diversification and household livelihood strategies in rural Africa: Concepts, dynamics and policy implications, *Food Policy*, 26, 2001.
- Baumann, P. 2000. Equity and Efficiency in Contract Farming Schemes: The Experience of Agricultural Tree Crops. Overseas Development Institute, London.
- Bautista R. M. and M. Thomas .2000. Macroeconomic and Agricultural Reforms in Zimbabwe: Policy Complementarities Toward Equitable Growth. Discussion Paper No. 57, Trade and Macroeconomics Division, IFPRI, June 2000
- Bautista, R., H. Lofgren and M. Thomas.1998. Does Trade Liberalization Enhance Income Growth and Equity in Zimbabwe? The Role of Complementary Policies. TMD Discussion Paper 32, September 1998
- Bautista, R. and M. Thomas. 1997. Income Effects of Alternative Trade Policy Adjustments on Philippine Rural Households: A General Equilibrium Analysis. G. Peters and J. von Braun, eds., *Food Security, Diversification, and Resource Management: Refocusing the Role of Agriculture?* Brookfield, VT: Ashgate Publishing.
- Boyce and Ravallion (1988) "Wage Determination in Rural Bangladesh: Effects of Relative Prices and Agricultural Productivity" *Agricultural Policies division, Policy Planning and Research, The World Bank*, cited in Ravallion (1990)
- Braverman, A. and J. S. Hammer. 1986. Multimarket Analysis of Agricultural Pricing Policies in Senegal. in Singh Inderjit, Lyn Squire John Strauss (Eds) *Agricultural Household Models Extensions, Applications and Policy*, Johns Hopkins University Press,Baltimore.
- Braverman, A., J. Hammer and C.Y. Ahn .1986. Multimarket Analysis of Agricultural Pricing Policies in Korea in Newbery, David and Nicholas Stern (Eds) *The Theory of Taxation for Developing Countries*, A World Bank Research Publication, Oxford University Press, New Delhi.

- Bureau, J.C., E. Gozlan and S. Marette. 1999. Food Safety and Quality Issues : Trade Considerations, OECD, Paris, October 1999.
- Butegwa, F and T. Awori. 1998. Globalization and Its Impact on Economic and Social Rights in Africa.. Associates for Change. September 1998
- Budd, J.W. 1993. Changing Food Prices and Rural Welfare: A Nonparametric Examination of the Cote d'Ivoire. *Economic Development and Cultural Change* 41 (April 1993), pp 87-603.
- Candler and Kumar. 1998. India: The Dairy Revolution. The impact of dairy development in India and the World Bank's contribution. The World Bank Operations Evaluation Department, Washington D.C.
- Carney and Watts. 1990. Manufacturing dissent: Work, gender and the politics of meaning. *Africa*, Volume 60 No.2 (1990).
- Carter and Mesbah for Chile, 1993 Can land market reform mitigate the exclusionary aspects of rapid agro-export growth? *World Development* 21 (7); 1085-1100.
- Cashin, P., H. Liang and J. McDermott. 1999. How Persistent are Shocks to World commodity Prices? *IMF Working Papers*, Washington DC.
- Cato and D. Santos. 1998. Costs to Upgrade the Bangladesh Frozen Shrimp Processing Sector to Adequate Technical and Sanitary Standards in *The Economic of HACCP*, ed. Laurian Unnevehr.
- Cogneau, D. and A.-Sophie Robilliard. 2000. Growth, Distribution and Poverty in Madagascar: Learning from a Microsimulation Model in a General Equilibrium Framework. Discussion Paper No. 61, Trade and Macroeconomics Division, IFPRI, November 2000.
- Cornia, G.A et al .1987. Adjustment with a Human Face. Oxford: Clarendon Press for the United Nations Children's Fund.
- Coyle, W., W. Hall and N. Ballanger. 2001. Transportation Technology and the Rising Share of US Perishable Food Trade in Regmi, A. (Ed) Changing Structure of Global Food Consumption and Trade, Market and Trade Economics Division, Economic Research Service, US Department of Agriculture, Agriculture and Trade Report, WRS-01-1.
- Cranfield, JAL, T.W. Hertel, J.S. Eales, and P.V. Preckel. 1998. Changes in the Structure of Global Food Demand. *American Journal of Agricultural Economics* 80:1042-1050.

- Deaton, A. 1989. Rice Prices and Income Distribution in Thailand: A Non-Parametric Analysis. *Economic Journal* 99 (Supplement 1989): pages 1-37.
- de Janvry, A., E.Sadoulet and A.Fargeix .1991. Politically Feasible and Equitable Adjustment: Some Alternatives for Ecuador.. *World Development* 19:11 1577-94
- de Janvry, A., E.Sadoulet, M.Fafchamps and M.Raki.1992. Structural Adjustment and the Peasantry in Morocco: A Computable Household Model. *European Review of Agricultural Economics*, Volume 19(4).
- de Janvry, A., E.Sadoulet, E. Thorbecke.1993. Introduction to a Special section, state, market, and civil organizations: New theories, new practices and their implications for rural development. *World Development* 21.
- Delgado, C. 1999. Sources of Growth in Smallholder Agriculture in Sub-Saharan Africa: The Role of Vertical Integration of Smallholders with Processors and Marketers of High Value-Added Items, *Agrekon*, Vol.38, May 1999.
- Delgado, L.C., J.Hopkins at al .1998. Agricultural Growth Linkages in Sub-Saharan Africa. IFPRI Research Report, Washington DC, International Food Policy Research Institute.
- Delgado, C., N. Minot and N. Wada. 2001. High-Value Agriculture in Diaz-Bonilla and Robinson (Eds) Shaping globalization for Poverty Alleviation and Food Security Focus 8, Policy Brief 6, August 2001.
- Dembele, N.N and J. M.Staatz.1999. The Impact of Market Reform on Agricultural Transformation in Mali. Paper presented at the Workshop on Agricultural Transformation, MSU *Agricultural Economics Staff Paper* no. 99-29.
- Dercon, S.1998. Wealth, risk and activity choice: cattle in Western Tanzania. *Journal of Development Economics*, Vol. 55, pp. 1-42, 1998.
- Diaz-Bonilla, E and L. Reza. 2000. Trade and Agro-industrialization in Developing Countries: Trends and Policy Impacts. *Agricultural Economics* 23(3), September 2000.
- Dirven M. 1999. Dairy Clusters in Latin America in the context of Globalization *The International Food and Agribusiness Management Review* Volume 2 (Issues 3-4) Autumn-Winter 1999.

- Dolan, C. and J. Humphrey. 2000. Governance and Trade in Fresh Vegetables: The Impact of UK Supermarkets on the African Horticulture Industry” *The Journal of Development Studies*, Volume 37(2), December 2000.
- Dorward, K. et al. 1998. *Smallholder Cash Crop Production under Market Liberalisation: A New Institutional Economics Perspective*, Wallingford, Oxford, CAB International.
- Dunstan, S. 2001. Will they Survive? Prospects for Small Farmers in Sub-Saharan Africa, Sustainable Food Security for all by 2020, September 4-6, 2001, Bonn, Germany.
- Ehui, S and C.L.Delgado. 1999. Economy-wide impacts of technological change in the agri-food processing sectors in Sub-Saharan Africa. Paper presented at the AAEA pre-conference on Agroindustrialization, Globalization and Industrial Development, Nashville, Tennessee, August 6-7, 1999.
- Escobal, J, V.Agreda, T.Reardon (2000) Institutional change and Agro-Industrialization on the Peruvian Coast: Innovations, Impacts, Implications, *Agricultural Economics* 23(3), September 2000.
- European Commission. 2002. *Rural Development Policy*.
- Fafchamps, M., C. Udry and K. Czukas. 1998. Drought and Saving in West Africa: Are livestock a Buffer stock? *Journal of Development Economics* 55.
- Falvey L. and C. Chantalakhana. 1999. Eds. *Smallholder Dairying in the Tropics*. ILRI (International Livestock Research Institute), Nairobi, Kenya.
- Food and Agriculture Organization of the United Nations. 1999. *The Importance of Food Quality and Safety for Developing Countries Report to the Committee on World Food Security, 25th Session, 31 May-3 June, Rome*.
- Fan, S. and P. Hazzell. 1997. Should India Invest more in Less-Favoured Areas? EPTD Discussion Paper 25, International Food Policy Research Institute, Washington DC.
- Farina, E. M.M.Q. and T. Reardon. 2000. Agri-Food GRades and Standards in the Extended MERCOSUR: Their Role in the Changing Agri-Food System, *American Journal of Agricultural Economics*, 82(5), 2000.
- Finger, M. J and P. Schuler. 2000. Implementation of Uruguay Round Commitments: The Development Challenge. *World Economy*, 23(4), 511-525.

- Gerard, F., I. Marty, F. Lancon and M. Versapuech. 1998. Measuring the Effects of Trade Liberalization: Multilevel Analysis Tool for Agriculture. Working Paper 30, CGPRT.
- Glewwe, P. and D. deTray. 1988. The Poor During Adjustment: A Case Study of the Côte d'Ivoire, World Bank, LSMS Working Paper No. 47, 1988.
- Gopinath, M and C.H.Bolling (2000) Effects of FDI in developing countries: the case of food and agriculture, *International Food Agribusiness Management Review*, Volume 2, Issues 3-4, Autumn-Winter 1999.
- Goss, J., D. Burch and R.E. Rickson. 2000. Agri-Food Restructuring and Third World Transnationals: Thailand, the CP Group and the Global Shrimp Industry *World Development* Volume 28, No.3 pp.513-530, 2000.
- Gow, H.R., D.H.Streeter, J.F.M.Swinnen (2000) Private Contract Enforcement mechanisms can succeed where Public institutions fail: the case of Juhocukor, *Agricultural Economics* 23(3), September 2000.
- Grosh, B. 1994. Contract Farming in Africa: An Application of the New Institutional Economics. *Journal of African Economies*, 3(2).
- Gulati, A. 2001. The Future of Agriculture in South Asia: W(h)ither the Small Farm? Sustainable Food Security for all by 2020, September 4-6, 2001, Bonn, Germany.
- Gulati, A. and T.Kelly. 1999. *Agricultural Trade Liberalization in India*, Oxford University Press, New Delhi.
- Haggblade, S., P. Hazell and T. Reardon. 2002. Strategies for Stimulating Poverty-Alleviating Growth in the Rural Nonfarm Economy in Developing Countries, EPTD Discussion Paper 92. Environment and Production Technology Division, International Food Policy Research Institute and Rural Development Department, The World Bank, Washington DC, USA.
- Handy C, C Bolling, P Kauffman, S Martinez, C Price and D Henderson. 1996. Foreign Direct Investment in the Processed Food Sector in Henderson D, C Handy and S Neff (Eds) *Globalization of the Processed Foods Market*.
- Harris R.L. 2001. A Computable General Equilibrium Analysis of Mexico's Agricultural Policy Reforms Discussion Paper No. 65, Trade and Macroeconomics Division, IFPRI, January 2001.

- Hazell, P. and Hojjati. 1995. Farm-Nonfarm Growth Linkages in Zambia. Discussion Paper No. 8, Environment and Production Technology Division, International Food Policy Research Institute, Washington DC.
- Holloway, G., C. Nicholson, C. Delgado, S. Staal, and S. Ehui (2000) Agro-industrialization through Institutional Innovation: Transactions Costs, Cooperatives and Milk market development in East African Highlands, *Agricultural Economics* 23(3), September 2000.
- Huang, J. and C.C David. 1993. Demand for Cereal Grains in Asia: The Effect of Urbanization. *Agricultural Economics*. Vol. 8, 1993, pp.107-124.
- IFAD (2001) Rural Poverty Report 2001 - The Challenge of Ending Rural Poverty, IFAD, Rome.
- Ingco, M. D. 2001. A Note on Globalization, Rural Development and Poverty Reduction: Emerging Challenges and New opportunities (mimeo) 2001
- Intal, P.S. 2001. The Persistence of Poverty in the Philippines: Is Globalization the Culprit?" Paper prepared for the Workshop in the Impact of Globalization on Poverty, St. John's College, University of British Columbia, Vancouver, British Columbia, Canada, 5-6 July, 2001.
- Jank, M.S, M.F.P. Leme , S.P.L.de Paula, P.F. Filho, and A.M. Nassar. 1999. Multinationals and intra-industry concentration: the case of Brazilian agribusiness exporters. *International Food Agribusiness Management Review*, Volume 2, Issues 3-4, Autumn-Winter 1999.
- Jayne, T.S. 1994. Do High Food Marketing Costs constrain Cash Crop Production? Evidence from Zimbabwe. *Economic Development and Cultural Change* 42(2):387-402.
- Jayne, T.S., A. Negassa, and R. J. Myers. 1998. The Effect of Liberalization on Grain Prices and Marketing Margins in Ethiopia. *MSU International Development Working Paper* No.68, Michigan State University.
- Jayne, T.S., T. Yamano, J. Nyoro and T. Awuor (2001) "Do Farmers Really Benefit from High Food Prices? Balancing Rural Interests in Kenya's Maize Pricing and Marketing Policy, Policy Brief, Tegemeo Institute for Agricultural Policy and Development.
- Jensen M. F. 2002. Reviewing the SPS Agreement: A Developing Country Perspective, Danish Food Research Institute, January 2002.

- Jiang, Xiejun Cut Flowers in Yunnan Province of China ITC Experience in technical Cooperation for export diversification Regional Workshop on Commodity Export Diversification and Poverty Reduction in South and South-east Asia. Bangkok, 3-5 April.
- Josling .1999. Globalization of the Food Industry and its Impact on Agricultural Trade Policy (mimeo) Paper prepared for the Conference on Agricultural Globalization, Trade and the Environment, University of California at Berkeley, March 7-9, 1999.
- Josling .1997. A Modeling Framework for Assessing the Trade Impact of SPS and TBT Regulations, Contribution to NRI Project on Classification and Analysis of Sanitary and Phyto snaitary Regulations and Technical Barriers to Trade in Agriculture.October 1997.
- Karanja, 2002 Liberalization and Smallholder Agricultural Development: A Case Study of Coffee Farms in Kenya.
- Key, N. and D. Runsten .1999. Contract Farming, smallholders and rural Development in Latin America: The Organization of Agro-processing Firms and the Scale of Outgrower Production. *World Development* 27(2), 1999.
- Khan, A.R (ud) A paper on comparative analysis of national poverty reduction experience in 8 Asian countries. SEPED series: macroeconomic policy and poverty reduction strategies. UNDP.
<http://www.undp.org/poverty/publications/case>
- Killick.1995. Structural Adjustment and Poverty Alleviation An Interpretive Survey *Development and Change* 26 pp 305-331.
- Kirk, C. 1987. Contracting Out: Plantations, Smallholders and Transnational Enterprise, IDS Bulletin, 1987, Vol. 18 No.2, Institute of Development Studies, Sussex.
- Korovkin, Tanya (1992) Peasants, Grapes and Corporations: The Growth of contract Farming in a Chilean Community, *The Journal of Peasant Studies*, Volume 19 No.2, January 1992.
- Kumar P. 1998. Food Demand and Supply Projections for India Agricultural Economics Policy Paper 98-01, New Delhi: Indian Agricultural Research Institute.
- Kydd, J., A. Doward, J. Morrison and G. Cadisch. 2001. The Role of Agriculture in Pro Poor Economic Growth in Sub-Saharan Africa. Imperial College of Science, Technology and Medicine at Wye.

- Lesser, W., T. Schmit, L. Ruiz. 2000. National Breeding Programs as Technology Sellers: Marketing elite germplasm for GMOs by Developing Countries.
- Levy, S. and S. van Wijnbergen. 1992. Agricultural Adjustment and the Mexico-USA Free Trade Agreement. in Eds. Goldin and Winters *Open Economies: Structural Adjustment and Agriculture*, Centre for *Economic Policy Research*, OECD, 1992.
- Little, P and M. Watts. 1994. *Living Under Contract: Contract Farming and Agrarian Transformation in Sub-Saharan Africa*. University of Wisconsin Press, Madison.
- Löfgren, H. , O. Chulu, O. Sichinga, F. Simtowe, H. Tchale, R. Tseka, and P. Wobst. 2001. External Shocks and Domestic Poverty Alleviation: Simulations with a CGE Model of Malawi. Discussion Paper No. 71, Trade and Macroeconomics Division, IFPRI, February 2001.
- Löfgren, H., M. El-Said and S. Robinson. 1999. Trade Liberalization and Complementary Domestic Policies: A Rural-Urban General Equilibrium Analysis of Morocco. Discussion Paper No. 41, Trade and Macroeconomics Division, IFPRI, April 1999.
- Donald, M. and T. Josling. 2000. Competition Policy and International Agricultural Trade (mimeo).
- Maskus, K. 2001. Intellectual Property in the Global Economy” Washington DC: *Institute for International Economics*.
- McCulloch, W. and Cirera. 2001. Trade Liberalization and Poverty: A Handbook. *Centre for Economic Policy and Research*, London, 2001.
- McKay, L. A., Winters and A. Mamo Kedir. 2000. A Review of Empirical Evidence on Trade, Trade Policy and Poverty. A Report to the DFID prepared as Background document for the Second Development White Paper.
- Minot, N. 1998. Distributional and Nutritional Impact of Devaluation in Rwanda. *Economic Development and Cultural Change*, Vol. 46(2), 379-402.
- Minot, N. 1986. Contract Farming and its Effect on Small Farmers in Less Developed Countries. Working Paper No.31, *Michigan State University International Development Papers*, East Lansing, MI.
- Minot, N. and F. Goletti. 1998. Export Liberalization and Household Welfare: The Case of Rice in Viet Nam. *American Journal of Agricultural Economics*, Volume 80(4), 738-749.

- Mittal, S. and P.Kumar. 2000. Literacy, Technology Adoption, Factor Demand, and Productivity: An Econometric Analysis, *Indian Journal of Agricultural Economics*, 55(3).
- Mutasa and Nyamandi. 1998. Report of the Survey on the Identification of Food Regulations and Standards within the African Region Codex Member Countries that Impede Food Trade (as cited in Henson and Loader)
- National Bank for agriculture and Rural Development. 2002. Annual Report, 2001-02.India.
- Nadal, A. 2000a. Corn and NAFTA: An Unhappy Alliance. www.grain.org/publications/jun002-en-p.htm.
- Nadal, A. 2000b. The Environmental and Social Impacts of Economic Liberalization on Corn Production in Mexico. OXFAM and WWF International, September 2000.
- Nankumba, J.S., B.Kalua. and P. Kishindo, P. 1989. Contract Farming and Outgrower Schemes in Malawi cited in Warning and Soo Hoo (2001).
- Nayyar, D and A. Sen. 1994. International Trade and Agricultural Sector in India in Bhalla, G.S. Ed. *Economic Liberalization and Indian Agriculture* ISID, New Delhi.
- Nielsen, C.P.I., S.Robinson and K. Thierfelder. 2001. Genetic engineering and trade: Panacea or dilemma for developing countries. *World Development*, Vol. 29, No. 8, pp. 1307-1324.
- Otsuki, W. and Sewadah, (ud) A Race to the Top? A Case Study of Food Safety Standards and African Exports
- Otsuki, T., J.S Wilson and M. Sewadah. 2001. Saving two in a billion: quantifying the trade effect of European food safety standards on African exports. *Food Policy* 26 (2001).
- Oxfam.(1996. Trade Liberalization as a Threat to Livelihoods: The Corn Sector in the Philippines. December 1996.
- Oxfam-IDS .1999. Liberalization and Poverty. *Final Report to DFID*, August 1999.
- Pardey, P. and B.D.Wright. 2001. Intellectual Property Rights and Agricultural R&D in Diaz-Bonilla and Robinson (Eds) *Shaping globalization for Poverty Alleviation and Food Security* Focus 8, Policy Brief 9, August 2001.

- Parris. 1999. Trade for Development – Making the WTO work for the Poor. *World Vision International*.
- Pradhan, B.K and A.Sahoo. 1998. MIMAP-India CGE Model. Paper presented at the Workshop on Micro-Impact of Macroeconomic Adjustment Policies (MIMAP), Third Annual Meeting, November 2-6, Kathmandu, Nepal.
- Quiroz, J and R.Soto (1995) “International Price Signals in Agricultural Prices: Do Governments Care? Documento de Investigacion No.88, Programa de Postgrado en Economia, ILADES/Georgetown University, Santiago, Chile
- Quiroz, J, W. Foster and A.Valdes. 1999. Agricultural Price Instability and price Floors: A Proposal, World Bank, January 1999.
- Reardon, T, F.Rello, A Schejtman and K.Stamoulis. 1999. Evaluating the employment impacts of agro-industrialization:hypotheses and illustrations from Latin America. AAEA pre-conference on Agroindustrialization, Globalization and Industrial Development, Nashville, Tennessee, August 6-7,1999.
- Rashid, S. 2002a. Liberalization, Access to Information, and Spatial Integration of Ugandan Maize Markets: A Dynamic Multivariate Analysis (mimeo).
- Rashid S. 2002b. Dynamics of Agricultural Wage and Rice Price in Bangladesh: A Re-examination. Discussion Paper No.44. Markets and Structural Studies Division, International Food Policy Research Institute, Washington DC, USA.
- Ravallion, M. 1990. Rural Welfare Effects of Food Price Changes Under Induced Wage Responses: Theory and Evidence for Bangladesh. *Oxford Economic Papers* Volume 42, pp574-585.
- Ravallion, M. and D. van de Walle. 1991. The Impact on Poverty of Food Pricing Reforms: A Welfare Analysis for Indonesia. *Journal of Policy Modelling* 13, pp 281-99.
- Reardon, T., J. Berdegue and G. Escobar. 2001. Rural non-Farm Employment and Incomes in Latin America: Overview and Policy Implications, *World Development*, Vol. 29, No.3.
- Reardon, T. and C. Barrett. 2000. Agroindustrialization, globalization and international development: An Overview of Issues, Patterns and determinants. *Agricultural Economics* 23 (2000.).

- Regmi, A. and M. Gehlhar. 2001. Consumer Preferences and Concerns Shape Global Food Trade in Growing Trade in Processed Foods Food Review, September – December 2001.
- Reimer J. J. 2002. Estimating the Poverty Impacts of Trade Liberalization, Purdue University, February 2002 (mimeo).
- Robilliard, A., F. Bourguignon . and S.Robinson. 2001. Crisis and Income Distribution: A Macro-micro Model for Indonesia. International Food Policy Research Institute and the World Bank.
- Rojjanapo, P. Trade Liberalization: Impact of Small Farmers in Thailand. International Famine Center.
- Rosenzweig, M., and K. Wolpin. 1993. Credit Market Constraints, Consumption Smoothing, and the Accumulation of Durable Production Assets in Low-Income Countries: Investments in Bullocks in India, *Journal of Political Economy*, Vol. 101, No. 2, pp. 223-244.
- Runsten, D. and N. Key. 1996. Contract Farming in Developing Countries: Theoretical Aspects and Analysis of Some Mexican Case Studies. Report LC/L.989. Economic Commission for Latin America and the Caribbean, Santiago, Chile.
- Sahn, D and A.Sarris. 1991. Structural Adjustment and Rural Smallholder Welfare: A Comparative Analysis from Sub-Saharan Africa. *The World Bank Economic Review*, Volume 5, May 1991, No.2.
- Sandee H and K. Burger .2000. Clustered Small Enterprise under economic distress; the impact of Indonesian crisis on small industry clusters with reference to Agro-industries. *The International Food and Agribusiness Management Review* Volume 2 (Issues 3-4) Autumn-Winter 1999.
- Sarris, A. 1997. Risk Management in Cereal and Oilseed Markets, Paper prepared for the Commodity Risk Management Group, World Bank, August 1997.
- Schejtman, A. 1998. Agro-industry and Small-scale Agriculture: Conceptual Guidelines for a Policy to encourage linkage between them. Report LC/R. 1669, Economic Commission for Latin America and the Caribbean, Santiago, Chile.
- Shepherd, A. 1997. Market Information Services: Theory and Practice, FAO, Rome.

- Shepherd, A. 2001. Bringing Market Information to Farmers in Dixon & Wattenbach (Eds.) (forthcoming), "Bridging the rural knowledge gap: Information systems for improved livelihoods" based on a workshop held at FAO Headquarters in Rome, on 4-7 December 2001.
- Siegel, P. and J. Alwang. 1999. An Asset-based Approach to Social Risk Management: A conceptual Framework. SP Discussion Paper 9926, Human Development Network, Social Protection Unit, The World Bank.
- Singh I. and J. Subramanian. 1986. Agricultural Household Modeling in a Multicrop Environment: Case Studies in Korea and Nigeria in Singh Inderjit, Lyn Squire John Strauss (Eds) *Agricultural Household Models, Extensions, Applications and Policy*, Johns Hopkins University Press, Baltimore.
- Singh I., L. Squire John Strauss (Eds). 1986. *Agricultural Household Models Extensions, Applications and Policy*, Johns Hopkins University Press, Baltimore.
- Singh, R.B and P. Kumar (2002). Empowering the Small Farmers: Fight Against Hunger and Poverty in India (mimeo).
- Slaughter, M.J. 1999. Globalization and Wages: A Tale of Two Perspectives. *World Economy* 22, 5 (July) 609-630.
- Staal, S., C Delgado, C Nicholson 1997. Smallholder Dairying under Transactions Costs in East Africa. *World Development* 25 779-794.
- Storm, S. 1990. Foodgrain Price Stabilisation in an Open Economy – A CGE Analysis of Variable Trade Levies for India. *Journal of Development Studies*, Volume 36(2) 136-159.
- Subasinghe, S., 2001. Promotion of Export Processing of Value Added Fishery Products from Bangladesh : A Success Story of an Integrated Project, Regional Workshop on Commodity Export Diversification and Poverty Reduction in South and South-east Asia. Bangkok, 3-5 April.
- Subramanian, S. 1990. Agricultural trade liberalization and India. Development Centre of the Organisation for Economic Co-operation and Development; Paris.
- Taylor, E. J. 2002. The Microeconomics of Globalization: Evidence from China and Mexico *OECD Global Forum on Agriculture*, 23-24 May 2002, OECD, Paris.
- Terry, E. and J. Clough (ud) The African Agricultural Technology Foundation.

- Thorbecke, E. 1991. Adjustment, Growth and Income Distribution in Indonesia.. *World Development* 19:11 1595-1614.
- Tschirley, D., T.S. Jayne, M. Mukumbu, Munhamo Chisvo, M. T. Weber, B. Zulu, R. Johansson, P. Santos and D. Soroko. 1999. Successes and Challenges of Food Market Reform: Experiences from Kenya, Mozambique, Zambia, and Zimbabwe. Policy Synthesis for USAID-Africa, No.39
- UNCTAD (2002) Farmers and Farmers' Associations in Developing Countries and their Use of Modern Financial Instruments Study prepared by the UNCTAD Secretariat, UNCTAD/DITC/COM/35, January 2002.
- UNCTAD. 2002. Export Logistics for ACP countries for fruit and vegetables and Horticultural Products
- Unnehver, L.J. 2000. Food Safety Issues and Fresh Food Product Exports from LDCs, *Agricultural Economics* 23(3), September 2000.
- Unnehver, L. and N. Hirschhorn. 2000. Food Safety Issues in the Developing World, World Bank Technical Paper No.469, World Bank, Washington DC, May 2000.
- Valdes, A. and W.Foster.2002. Reflections on the Policy Implications of Agricultural Price Distortions and Price Transmission for Producers in Developing and Transition Economies, CCNM/GF/AGR(2002)7, *OECD Global Forum on Agriculture*, OECD, May 23-24, 2002.
- Vorley, B. and J. Berdegue. 2001. The Chains of Agriculture, Opinion, World Summit on Sustainable Development, International Institute of Environment and Development.
- Warning, M. and W. Soo Hoo. 2001. The Impact of Contract Farming on Income Distribution: Theory and Evidence. Paper presented at the Western Economics Association International Annual Meeting, June 2000.
- Warning M. and Nigel Key (2002) The Social Performance and Distributional Consequences of Contract Farming: An Equilibrium Analysis of the Arachide de Bouche Program in Senegal *World Development Volume* 30, No. 2 pp 255-263, 2002.
- Warr Peter G .2001 Welfare and Distributional Effects of an Export Tax: Thailand's Rice Premium. *American Journal of Agricultural Economics* 83(4) November: 903-920.

- Watkins, K. 1997. Globalization and Liberalization: Implications for Poverty, Distribution and Inequality *Occasional Paper 32*, UNDP.
- Wei A and Cacho J (2000) Establishing linkages between globalization, developing country economic growth and agro-industrialization: the case of East Asia. *International Food and Agribusiness Management Review* Volume 2 (Issues 3-4) Autumn-Winter 1999.
- Wilson, J. S and T. Otsuki. 2002. To Spray or Not to Spray: Pesticides, Banana Exports and Food Safety, (mimeo)
- Wilson and Otsuki. 2001. Global Trade and Food Safety: Winners and Losers in a Fragmented System, (mimeo). *Development Research Group*, The World Bank, 1818 H Street NW, Washington DC.
- Wood, A. 1995. How Trade Hurt Unskilled Workers. *The Journal of Economic Perspectives* Vol. 9 No. 3 (Summer): 57-80
- World Bank .2002. Building Institutions for Markets, *World Development Report 2002*, The World Bank, Washington DC.
- Wu, Y. 1999. China's Consumer Revolution: Emerging Patterns of Wealth and Expenditure. Edward Elgar Publishing, Cheltenham, 1999.

APPENDIX 1—COOPERATIVES, CLUSTERING AND CONTRACT FARMING: WHAT DO STUDIES CONCLUDE?

Three institutional mechanisms – cooperatives, clustering and contract farming – have been discussed extensively in the context of small farmers. The question is: do such arrangements benefit smallholders? If not, how can we ensure that they do? Following is a brief review of work that addresses this question.

COOPERATIVES

Cooperatives have been recognized as useful means for small farmers to overcome constraints of high transactions costs of operating on a small-scale. Successes with cooperatives have been particularly prominent with small-scale dairy. Small-scale dairy producers, for instance, face hidden costs that limits their ability to participate in markets – these transaction costs may be pecuniary and non-pecuniary (Staal et al 1997). Cooperative sales by resource poor dairy farmers in peri-urban settings in East African highlands, in this case, have been found an effective route for overcoming these transaction costs. India's milk cooperatives under Operation Flood too have been noteworthy successes in this respect.

However, it has been pointed out that institutional innovations by themselves may be inadequate to foster smallholder participation. There is a critical role played by asset accumulation of the household, availability of infrastructure, knowledge and information (Holloway et al, 2000), which calls for proactive government role to facilitate the operations of institutions such as cooperatives. Holloway et al (2000) also point out that

cooperatives in Africa have often been beset with problems primarily due to the inability of the members to hold the management accountable to its members leading to inappropriate political activities or financial irregularities (de Janvry et al 1993, Akwabi-Ameyaw, 1997). At other times it has often been due to investment at scales beyond the organizations ability to manage or if their area of operations too broad. Staal et al (1997) for instance attribute the success of cooperatives in Uganda and Kenya to their focused orientation to milk production and marketing alone.

CLUSTERING

The second form that has drawn attention is clustering which typically occurs spontaneously and is not always organized. Clusters are not always homogeneous and their impact on small farmers can vary substantially. While clusters in palm sugar and soybean sector in Indonesia comprise small firms (Sandee and Burger, 2000) as in palm in Malaysia (Ahmad and Tengku), dairy clusters in South American countries include farms of varying scale. Dirven (2000) points out that clustering may not always protect small producers, drawing on examples from dairy clusters in Argentina and Chile. It would be interesting to determine the cases under which smallholders stand to benefit and where they may not.

CONTRACT FARMING

The other important institutional innovation is contract farming. Linking up of small farmers with food industry through vertical coordination is being increasingly advocated (Delgado, 1998). But there is currently debate on whether that is really the

right way to go. Reviews of contract farming literature are available in Grosh (1994), Minot (1986), Runsten and Key (1996, 1999) and Warning and Soohoo (2001), which discuss these issues.

What are the likely benefits? What could be its adverse consequences?

Contract farming is known to raise incomes of growers significantly and result in more stable incomes. It also facilitates dissemination of cropping technologies to farmers with the contracting firm becoming a channel. From the point of view of farmers, contracting with a firm can help remove constraints like access to credit, inputs, information and services. In particular, these firms may be able to provide some of these services better than the government since they may more tuned in to local needs and circumstances. In this respect, contract farming is seen by some as a way in which private firms can subsume the role of the state with the latter's withdrawal and could perform these functions more efficiently. In the larger context, contract farming could have substantial positive multiplier effects for employment, infrastructure and market development.

On the other hand, however, the emergence of contractual relationships are also often associated with some adverse effects. Firstly, there is some debate as to whether contract farming as an institution might be exclusionary vis-à-vis small farmers. A related question has been whether such arrangements reinforce existing income inequalities or has the opposite effect and makes income distribution more equal. There is also a fear that even if small farmers did manage to enter into contractual relationships with the large agro-industry their bargaining power could be severely constrained and they might end

up facing monopsonistic markets and lead to exploitative contractual terms. Also, where contract farming is mainly for cash crops, farmers could continue to be vulnerable to price fluctuations and food shortages. For the farmer, contracting could often result in “self-exploitation” of own labour through longer hours, etc. and occasionally contribute to tensions within the household – between male household heads and their wives and children (Carney and Watts 1990). Sometimes, when plantation agriculture is replaced by contract farming, it could have the effect of absolving the firm of the responsibility of providing minimum basic requirements to workers. Some believe that contract farming leads to “disguised proletarianization” wherein the firm secures both the farmer’s land and labour while leaving the farmer with the formal title of both (Clapp 1994). Finally at the macroeconomic level, collusion between the state and powerful agro-industries could skew policies to turn against peasant interests.

It is evident from the literature that there are circumstances where contract farming might be beneficial to smallholders and where it might be exclusionary or have negative effects.

Runsten and Key (1996, 1999) while elaborating on theoretical aspects of contract farming also identify circumstances under which it may benefit the smallholder. In a case study of the frozen vegetables industry in Mexico, they analyze the circumstances under which firms contract with large or small growers. Initially, the multinationals opted to contract with larger farmers since they felt that *smallholders depended on the firm too much* for far too many services (loans for operating capital, inputs, etc.) while increasing communications costs (due to lack of telephones), monitoring etc. When one of the

MNCs did contract with smallholders it stemmed in part from a threat of the few large farmers *colluding and bargaining* for higher prices for the output. Invariably, when the number of large farmers grew, they displaced small growers in the company's relationship map. Warning and Soohoo (2000) point out, for instance, that while on the one hand agro-industrial firms would prefer to contract with large growers due to the substantially *lower transactions* costs of dealing with them, the opposite could also occur under some circumstances. *Weak institutional development* (such as poor market development, lack of access to credit and insurance) could render contracting with smallholders mutually beneficial. While the firm takes advantage of the limited alternatives of smallholders, the smallholders would be able to access markets, credit and insurance. The experience of MNCs in Mexico suggests that where small growers were contracted for produce, it was more on account of *absence of alternatives*. That the nature of the contract party may not matter so much is brought out by the example of tea and sugar in Malawi where the state engages farmers in contracts. A bias against the smallholders that is apparent it seems is rather the result of *nature of crops*, which entails specialized inputs, complex production processes and substantial capital (Nankumba and Kalua, 1989).

There have been several other examples of smallholders being integrated into contracting relationships in a mutually beneficial way. Horticulture in the central Kenyan highlands is an instance where a capital-and skill intense activity has shifted to smaller-scale contract farms with backing by the government. So too in Guatemala and Honduras, where foreign distributors have contracted with large numbers of small farmers

particularly in areas where population densities in vegetable growing areas was high.

While typically, such small-scale participation in the livestock sector is more difficult. In this context an example of successful contract farming is the Soro-Soro Ibaba cooperative in Southern Luzon, Philippines. Here are large number of non-agricultural investors that are linked with regionally defined groups of small-scale farmers. The latter is paid a fixed fee per animal and is responsible for providing infrastructure and management services during the fattening phase, while the hogs, veterinary support and marketing services are provided by the cooperative.

An interesting indigenous institutional innovation has been observed in Peru's cotton industry, where the small farmers inability to contract directly with large firms is redressed by the formation of farmers companies (Escobal, 1999). Smallholder participation has also been achieved through use of differentiated contracts (which enabled farmers to choose according to their needs and therefore presumably welfare enhancing)³², through extra-contractual transactions (such as employment of the smallholder or his family in the firm), sharing the transaction costs with the smallholders and often success in bringing it down. Of the few quantitative studies in this area, Warning and Key (2000) find from a case study of peanut contract farming in Senegal that the size of the landholding did not determine participation as much as reputation did, emphasizing that smallholders are not inherently disadvantaged with the emergence of new contractual relationships with industry. Among the important factors in its success is

³² It is noteworthy that companies that were unable to match Campbells' offers on differentiated contracts put pressure on Campbell to align its prices with that offered by others.

the absence of substantial risk in its cultivation i.e. not significantly different from that in traditional crops and the use of local intermediaries to monitor and enforce contracts.

Another instance is where the costs of contract enforcement were large enough to outweigh the generally higher costs of transacting with small farmers encouraged a shift to small growers. The high transactions costs and institutional constraints faced by small growers reduced the chances of their reneging on the contracts. It meant that small growers would be more dependent on the firms which was good for the firms, the smallholders themselves would have access to institutions, markets and credit that they would not have had otherwise.

Some fear that it is precisely this dependence of the smallholders on large profit-driven agri-business firms that would drive the latter to exploit the former. Vorley and Berdegue (2001) suggest that civil society groups must monitor performance of food processors, retailers and food service companies with regard to sourcing from smallholders with fair terms of trade. A responsive and accountable state should be a partner with an economically and politically organized rural civil society to overcome exclusion from policy making and from markets, improve bargaining power and access technical assistance to meet standards and consistency of supply³³.

It is clear from this review that whether the smallholder is involved and benefits from contractual ties with the agro-industry is specific to the situation and there is no

³³ An interesting related question is the role of NGOs in fostering small-holder participation in certain sectors they are providing key services as part of a micro-enterprise development strategy. As Reardon and Barrett (2000) point out, whether this truly assists small players or whether they crowd out indigenous private service providers remains an open question.

inherent bias in either direction. In particular, three issues could be seen as important here (Delgado, Minot and Wada, 2001) (1) whether wholesale and retail outlets have alternatives to smallholders for sourcing their supply (say, corporate farming plantation style) (2) whether governments facilitate smallholder production and (3) the degree of participation by smallholders in managing smallholder schemes.

A few points are worth emphasizing at this stage. *First*, is the importance of a referee to ensure that smallholders do indeed benefit – a role that can be played by independent regulatory bodies or arms of the state or civil society. *Second*, as most studies indicate, governments could, indeed ought to play an important role to foster smallholder participation in the food industry by providing the necessary asset base, infrastructure etc. to reduce high transactions cost that constrain them (Holloway et al, 2000, Delgado 1998, Escobal et al, 2000) and availability of a credible enforcement mechanism (perhaps along the lines Vorley and Berdegue, 2001 suggest) to minimize the problem of moral hazard. However the role of the state should not go so far as to enforce compulsory contract farming or to undertake contract farming itself.

The other set of issues that must be addressed is the effect of emergence of agro-industries on aggregate employment, rather than a narrow focus on its sourcing of produce. As mentioned above neither an increasing capital intensity, nor emergence of large-scale agri-businesses have any inherent anti-smallholder bias if they generate positive net gains in employment. Barron and Rello (2000) describe the case of the tomato agroindustry in Mexico as an instance where the development of the agro-industry had an employment-generating effect on poor households. Thus it is possible that even as

agro-industry crowds out smallholders its development could have compensating increases in employment. The net-effect of these two contrary effects has not been documented in great detail. The case study of Peru's asparagus and cotton agro-industry reveals that the contracting of farmers in the former (that was composed mainly of large farmers) and the formation of farmers' companies (comprising small cotton growers) has ambiguous impact on employment. The ambiguity arose because on the one hand, the emergence of asparagus led to farm-firm contracts that excluded small farmers and also represented a shift to capital-intensive industry impacting employment adversely. On the other hand, large farmers moving out of cotton to asparagus meant that smallholder participation in the cotton-industry was much higher now, consolidated through farmer companies. This area, it appears, needs more attention than has been accorded so far.

It is evident that whatever the institutional arrangement, it can work both ways, benefit smallholders in some cases and adversely affect them in others. It is essential to review carefully the experiences – both successes and failures – to identify the conditions under which smallholders can be effectively integrated into the agri-food chain in a beneficial way. Also important is that, all else being equal, a particular arrangement may work well in some regions but may fail in others, because of social or cultural factors.

These issues point to several policy implications in order to strengthen the position of small farmers in contractual relationships (Porter and Phillips-Horward 1997). One of them is encouraging smallholders to maintain alternative sources of income and not abandon them altogether which would give them a bit of leverage, and to have firms permit cultivation of non-contract crops alongside contract crops. This could

enhance household level food security for instance, enabling cultivation of food crops as well wherever possible. Another recommendation is that contracts could be signed with and payments made to women when they are responsible for crop production. Similarly introduction of participatory monitoring and the involvement of local population in managerial positions in the firm would go a long way in building mutual trust. Thus there is a significant role for policy to ensure that smallholders truly gain from institutional innovations like contract farming.

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