Pro-Poor Livestock Policy Initiative
A Living from Livestock
Research Report

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Pig Systems, Livelihoods and Poverty in South-East Asia: Current Status, Emerging Issues, and Ways Forward[1]

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1. Introduction

Engagement in livestock production is an important income generating activity among agricultural households in rural areas in the developing regions of the world. The rapidly increasing demand for livestock products at the global level, particularly due to increasing populations, increasing per capita incomes, and rapid urbanization in the developing countries, presents opportunities for the rural poor in these countries to participate in and benefit from such growth. On the other hand, in the supply side of the market, new technologies as well as new organizations in production, processing, procurement and distribution systems have emerged to more efficiently meet not only the larger volumes required but also the increasing demand by consumers for food products quality and safety, apart from complying with public rules and regulations governing the trade in livestock products. Within this environment, there is no automatic link between the engagement in livestock as livelihood source by rural households and the increasing demand for livestock products. Strong market links between livestock producers in the rural areas and the growing markets for livestock products within the economy is a necessary condition for taking advantage of these opportunities for increased incomes by rural livestock keepers.

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2. The Global Picture

2.1 Differential Responses to the 'Drivers' of Change

Livelihood from livestock among rural households in majority of the developing countries are not specialized stand-alone economic activities but are closely integrated with other agricultural endeavour within the framework of mixed production systems (e.g., crop-livestock). This general statement, however, recognizes that there are also a significant proportion of poor livestock keepers in developing countries that specialize in livestock, such as the pastoralists in the arid zones of Africa, Asia and Latin America. The mixed-farm facet of livestock livelihood is significant in that the potentials to livelihood improvement can be situated within the development stage of agriculture of individual countries at the macro level, and of farms at the micro level within countries. Pingali (2005) classifies the development of agriculture into three broad stages – "traditional", "modernizing", and "globalizing", according to some criteria such as the share of agriculture in GDP, share of labour in agriculture, output mix, importance of scale economies, and market orientation. In terms of the last criterion, 'traditional' farms would be more subsistence-oriented, with occasional opportunistic ventures to local markets. 'Modernizing' farms would generally market-oriented, with links to domestic markets at the local and/or national level. In most of the developing countries, the "globalizing" farms would constitute only a small proportion of farms in the rural areas. Nevertheless, the integration of the agricultural economies of developing countries to global agricultural trade would have impacts that reverberate in the domestic markets of rural livestock keepers.

The increasing demand for livestock products in developing countries presents a opportunity for increased incomes of households raising livestock or are engaged in the trade of the commodity along the various market chains of the livestock sector. However, the increasing demand for product quality and food safety among urban consumers, and the increasing competition from imports as well as from larger-scale and more sophisticated commercial suppliers, present a challenge particularly for smallholder rural livestock keepers to participate in, compete for, and defend their own market share in the growing demand for livestock products.

The extent to which smallholder rural livestock producers and their market chains can participate in and benefit from the growth in the livestock economy depends on the strength of linkage between the rural farms and the various classes of consumers, intermediated by market chains in both the formal and informal markets (Haggblade *et al*., 2005). When that link is strong, supported by functional physical and institutional market infrastructure, accessible to larger-scale and smallholder producers alike, the growth in demand, the technological advances in production, and the growing sophistication in the organization of processing and distribution, would most likely translate to increased incomes of both larger farms and smallholder rural-based producers, meeting such growth and diversity in the demand for livestock products.

When the strength of linkage between livestock producers and consumers are biased in favour of more progressive farmers (e.g., better access to physical and institutional market infrastructure) at the expense of producers with a weaker political voice and bargaining power, then the impacts of growth in the livestock sector would tend to be inequitable. Growth would likely benefit those with better access to lucrative mainstream markets catering to urban centres, while the rest would be consigned to compete among themselves in the marginal markets where growth in demand may not be as strong. Livestock producers shut out from the growth markets may exit from the livestock sector to find alternative livelihoods.

Finally, when at the country level, rural livestock producers are barely connected to urban markets, growth in demand for livestock products could readily be met with increased imports. With local rural producers disconnected from the mainstream markets, the livestock livelihood of rural households would likely stagnate. When this happens to the entire rural sector at the country level, with no source of growth stimulation, agricultural productivity will deteriorate, leading to lower real returns and incomes to agricultural labour, and worsening rural poverty. Along this evolution of events, the exit of households from agriculture, the shift to mean jobs in non-agricultural activities, and the migration to urban centres would be seen as ‘escape valves’ out of deeper poverty, rather than a reflection of the growth in demand for non-agricultural labour.

The considerations above argue that improvements in livestock livelihood as a tool for poverty alleviation cannot be seen or treated in isolation. Pure technical interventions to increase livestock productivity at the farm level would not automatically translate to a sustained improvement in household incomes and to a reduction in poverty. While there are real resource costs to such technical interventions, requiring the use of scarce physical, human, and financial resources from the public or/and private sector(s), the intended benefits to poorer rural households may not necessarily be forthcoming.

3. The Livestock Sector and Pig Systems in Southeast Asia and the Pacific

Asia is a major producer of pigmeat in the world. Table 1 shows that Asia accounts for largest share (43%) of global pig output (Groenewold, 2004). The next major group comprises the OECD countries (37%).

Table 1: Shares in volume of pigmeat output, by region, 2004

Region	Output Volume ('000 MT)	Share (%)
Asia	31,368	42.9
OECD	27,167	37.2
E.Europe & CIS	10,759	14.7
Latin America & Caribbean	3,126	4.3
Sub-Saharan Africa	526	0.7
Other Developed	135	0.2
West Asia & North Africa	38	0.1
Total	73,118	100.0

Source : Groenewold, 2004.

In Asia, in terms of production systems, a very high proportion of pig output (close to 80 percent) is produced under 'mixed' farms (crop-livestock), as shown in Table 2. Only around a fifth are produced in specialized intensive 'landless' systems, production under landbased extensive systems are not significant.. This configuration confirms the predominance of livestock livelihoods being integrated within the gamut of agricultural activities of households within the farm.

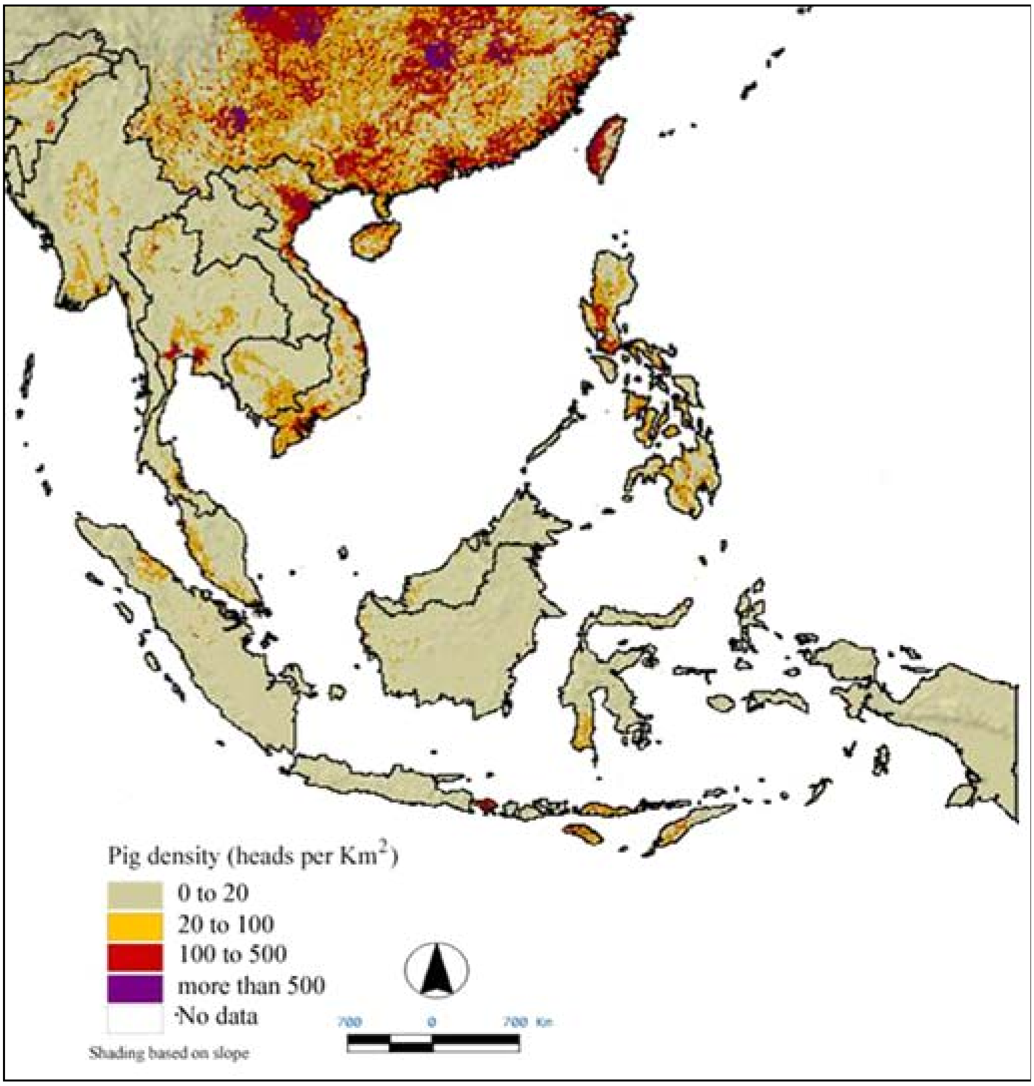
Table 2: Distribution of pig output by production system in Asia, 2004

Production System	Share (%)
Mixed Crop-Livestock	78
Landless Intensive	22
Landbased Extensive	0
Total	100

Source : Groenewold, 2004.

Within Asia, major concentrations of pig production are located in Southern China and Southeast Asia, as seen in Figure 1. In the Southeast Asian region, marked concentrations could be found particularly around the major urban centres of Viet Nam, around Hanoi in the north and Ho Chi Minh in the south, around the Metro Manila area in the Philippines, and around the Bangkok Metropolitan area in Thailand.

Figure 1: Concentrations of pig production in South China and Southeast Asia.



Source: FAO, 2006

3.1 Agriculture and the Livestock Sector

The significance of Agriculture in the economy, in terms of their relative contribution in GDP, varies among the respective countries in SEA and the Pacific. Table 3 shows that as of 2005, Agriculture is relatively more important in lesser developed economies of Myanmar, Lao PDR, Cambodia, Timor Leste and Papua New Guinea (higher than 30 % share in GDP) as compared to the rest of the countries. In all countries in Southeast Asia, from 1990 to 2005, the relative significance of Agriculture in the economy exhibited a declining trend, as could be expected as economic growth and development proceed. The reverse happened in the two Pacific countries.

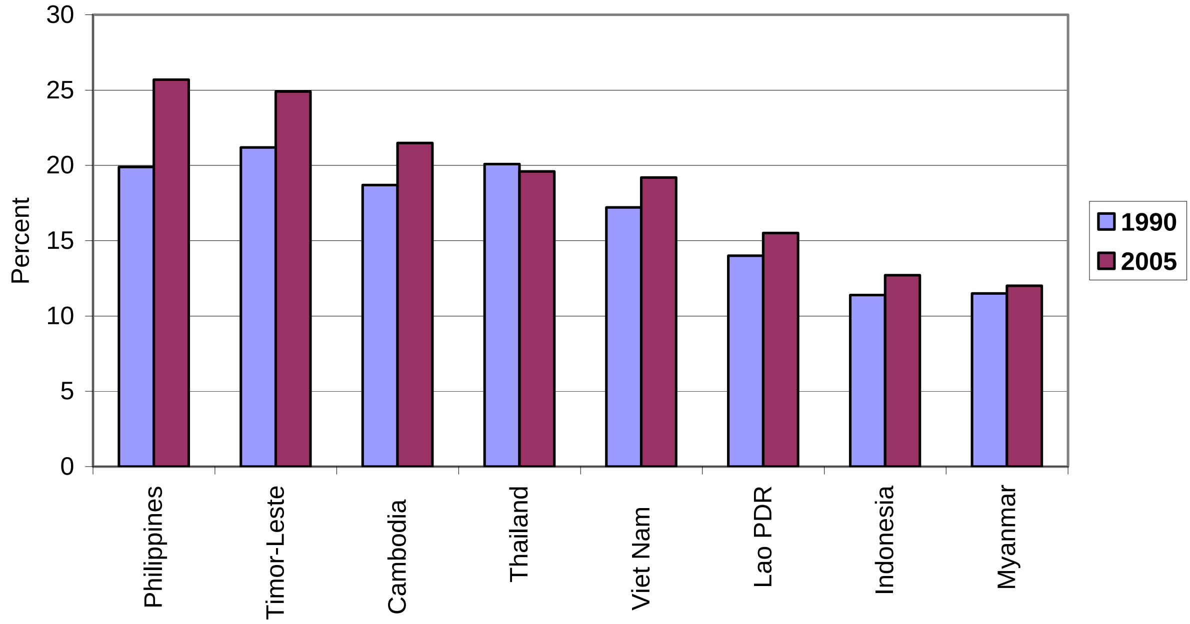
Table 3: Share of Agriculture in total GDP, 1990-2005 (In percent)

Country	1990	2005
Southeast Asia		
Myanmar	57.3	50.6
Lao PDR	61.2	47.0
Cambodia	55.6	32.9
Viet Nam	38.7	20.9
Philippines	21.9	14.4
Indonesia	19.4	13.4
Thailand	12.5	9.9
Pacific		
Timor-Leste	29.8	31.6
Papua New Guinea	29.0	33.1

Source: ADB, 2006

In terms of the significance of the livestock sector in the agricultural economy, the structure varied among countries. As of 2005, the contribution of livestock in the agricultural GDP is seen to be more prominent in the countries of The Philippines, Timor Leste Cambodia, Thailand, and Viet Nam, as compared to the rest (Figure 2). From 1990 to 2005, except for Thailand, the share of livestock in Agricultural GDP showed an increasing trend. The case of Thailand is special in that its major livestock industry, the exporting poultry sub-sector, was severely hit by the avian influenza crisis in 2004 and 2005. It is significant to situate the general trend of the increasing contribution of livestock in Agriculture within the context of the declining share of Agriculture as a whole in GDP. This indicates that the livestock sub-sector was posting a more rapid growth than the other sectors of agriculture combined. Thus, in SEA and the Pacific, the livestock sector is a strong source of growth among rural households for income generation and poverty reduction.

Figure 2: Comparative trends the share of livestock in Agriculture GDP, 1990-2005 (In percent of Agriculture GDP)



Source: FAOSTAT, 2006

3.2 Meat Consumption Patterns and Trade

The level of per capita meat consumption shows quite wide variations among countries in SEA and Timor Leste (from 10 kg to 48 kg per capita). Table 4 shows that in general, higher per capita consumption (>25 kg) is associated with the countries with more developed economies and with higher *per capita* incomes (Malaysia, Thailand, The Philippines, Viet Nam) as compared to the rest. In all countries, an increasing in *per capita* consumption in meat was exhibited between 1990 and 2002, with the strongest rates of growth posted in Viet Nam and The Philippines. This trend reflects the growing demand for meat products in the entire region.

Table 4: Growth in per capita meat supply (consumption), 1990-2002 (In kg)

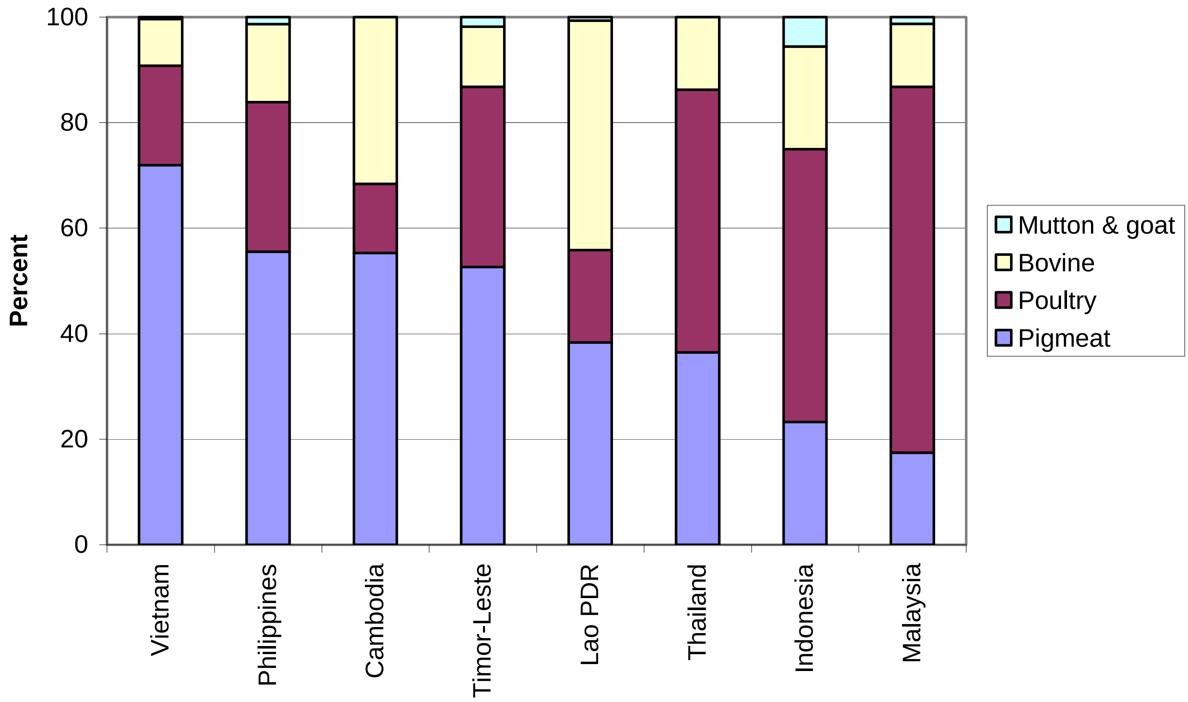
Country	1990	2002	Annual growth (%)
Malaysia	38	48	1.9
Philippines	18	30	4.3
Viet Nam	16	28	5.0
Thailand	23	27	1.4
Timor-Leste	18	22	1.8
Cambodia	12	15	1.5
Lao PDR	11	15	2.7
Indonesia	8	10	1.5

Source : FAOSTAT, 2006.

The relative importance of pigmeat as compared to other sources of meat varies among countries in the region. Figure 3 shows that pigmeat is the most dominant source (>50% of meat consumption) in Viet Nam, The Philippines, Cambodia, and Timor Leste. On the other hand, poultry is the most popular meat source for Malaysia, Indonesia, and Thailand. The lesser significance of pigmeat in Malaysia and Indonesia could be traced to cultural and religious traditions influencing tastes and preferences of the general population. Lao PDR is one country where bovine meat is the most dominant. This may not only reflect consumer preferences but also the relative abundance of resources in the production of cattle and buffalo, as compared to the other countries.

Figure 3: The relative importance of pigmeat and other meat types, various countries, 2002

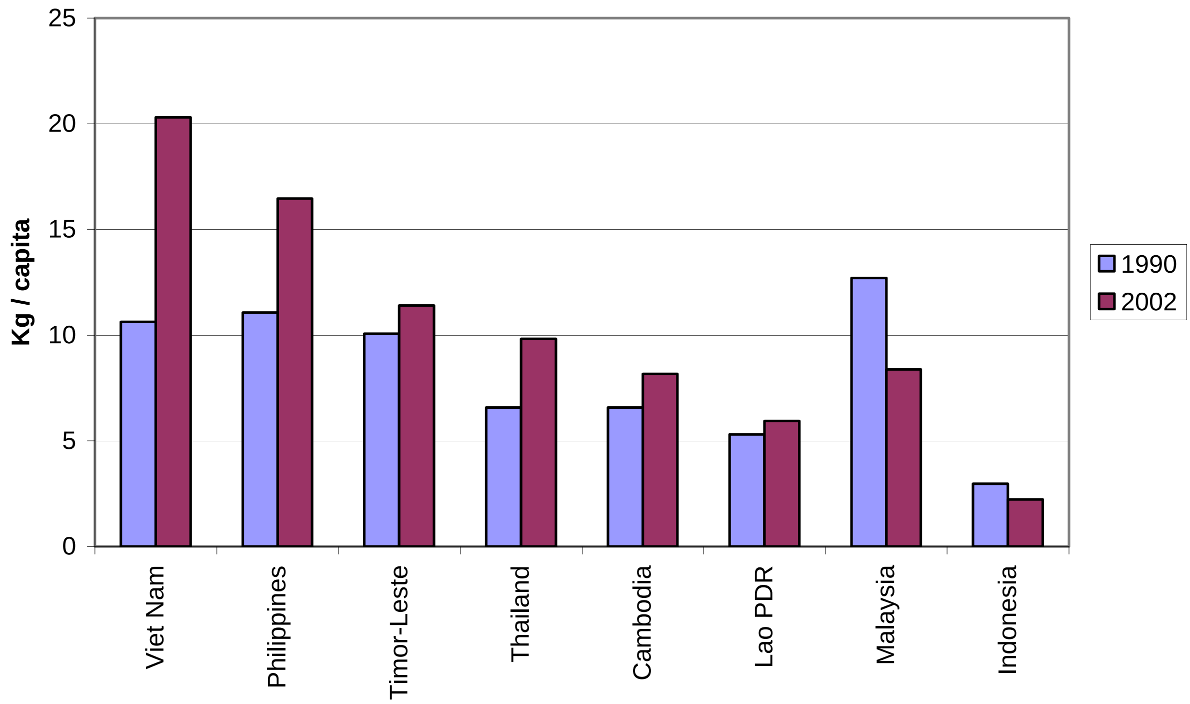
(In percent of total meat consumption)



Source: FAOSTAT, 2006

Figure 4 shows comparative per capita pigmeat consumption in absolute quantities. As of 2002, pigmeat consumption was highest in Viet Nam and The Philippines (>15 kg/cap). Least consumption (<6 kg/cap) was registered in Indonesia and Lao PDR. Except for Indonesia and Malaysia where *per capita* consumption of pigmeat declined between 1990 and 2002, in all other countries, per capita consumption of pigmeat showed an increasing trend over time. The largest absolute and relative improvements took place in Viet Nam, where large strides in economic growth had been taking place over that period.

Figure 4: Trends in levels and growth of per capita pigmeat consumption in various countries, 1990-2002 (In kg)



Source: FAOSTAT, 2006.

The differences in consumption patterns show that for a number of countries, pigmeat is significant and occupies the largest component of meat consumption, and in these countries, the increase in meat consumption levels have been relatively rapid. However, it is also the case that for some countries, other meat types carry greater importance, as seen in the dominantly Islamic countries of Indonesia and Malaysia, where *per capita* consumption of pigmeat is on a downward path.

3.3 Net Trade Position in Pigmeat

The net trade position in pigmeat also shows contrasting performance among the countries in the region. Table 5 shows that Thailand and Viet Nam have emerged as the leading net exporters of pigmeat, with net export position improving between 1992 and 2002. On the other hand, Timor Leste, Malaysia, and The Philippines are shown to be net importers, with imports gradually increasing their role as source of domestic supply of pigmeat over the same period. The net export position of Thailand and Viet Nam points to the challenges for exporters in these countries to maintain and defend current export markets and niches, as food safety standards continue to be tightened especially in markets of developed countries. For net importing countries, the influx of imports presents the challenge to domestic producers to compete in supplying domestic consumers, particularly in the large urban centres, with pigmeat that are comparable with imported products, not only in terms of price, but also in terms of product quality, food safety, and product packaging. It becomes evident that competition at the farm level is influenced by competitiveness also along the entire chain that leads to domestic consumers. For countries with little external exposure of the pig industry such as Indonesia, Lao PDR and Cambodia, focusing on constraints linking producers and consumers within domestic markets and internal competition among producers would be the more pressing issues.

Table 5: Net exports position in pigmeat trade, 1992-2002
(As percentage of total domestic supply)

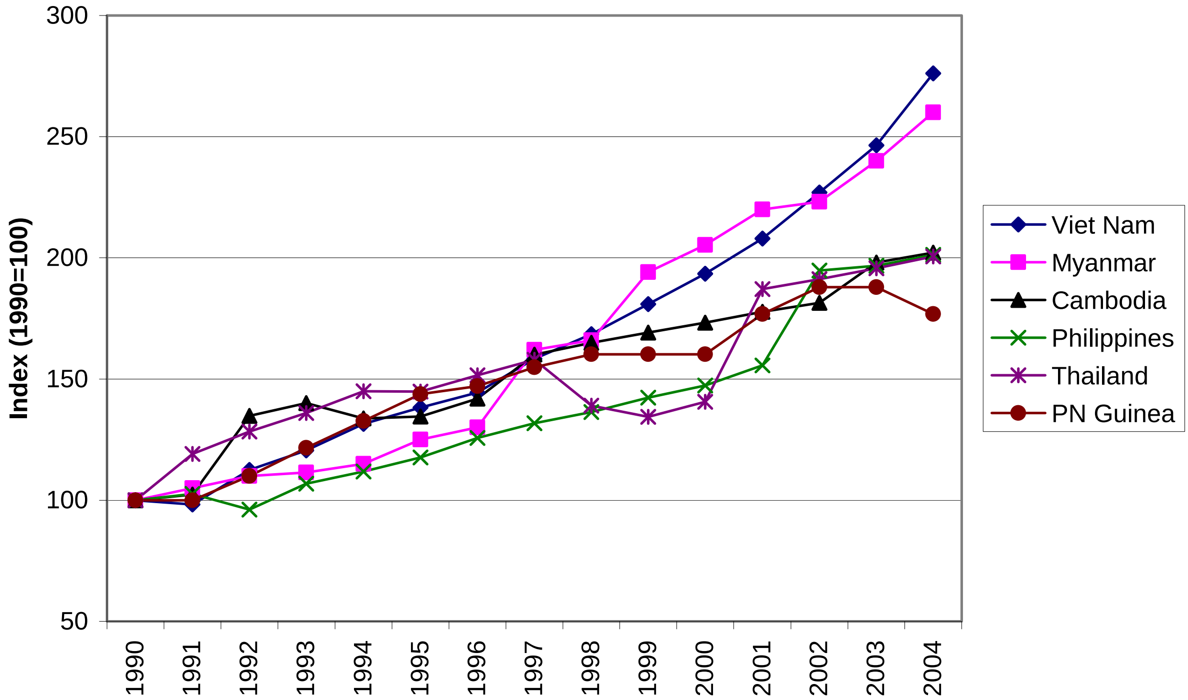
Country	1992	2002
Thailand	0.3	2.6
Viet Nam	2.1	2.3
Indonesia	-0.4	0.5
Lao PDR	0.0	-0.01
Cambodia	0.0	-0.02
Philippines	-0.1	-2.5
Malaysia	-2.7	-4.2
Timor-Leste	-7.0	-10.4

Source : FAOSTAT, 2006.

3.4 Production Response to Increased Regional Demand for Pigmeat

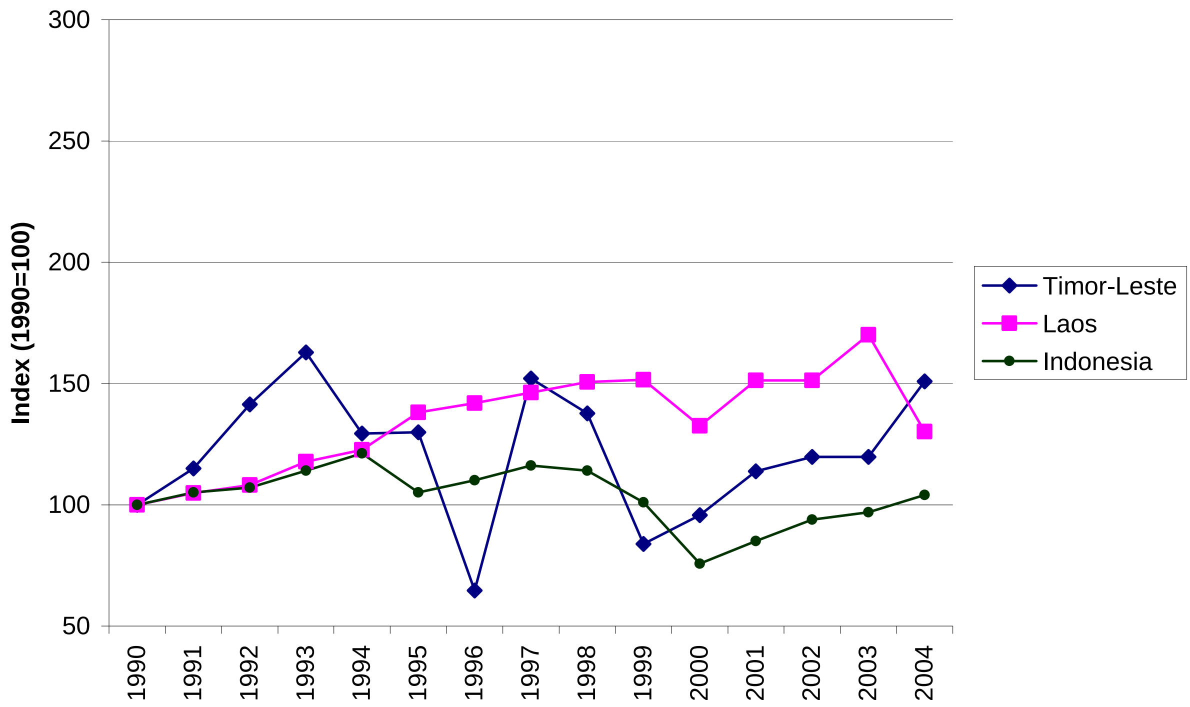
The production response to increasing demand for pigmeat in countries in SEA and selected Pacific Countries in the region does not show a uniform corresponding rapid increase in output. Observing the trends in the output index covering the years 1990 to 2004, countries could be grouped into ‘high growth’ and ‘slow growth’ countries. Figure 5 shows that for ‘high growth’ countries, output increase was between 75 and 175 percent with respect to their 1990 levels. These countries included Viet Nam, Myanmar, Cambodia, The Philippines, Thailand, and Papua New Guinea. For the ‘slow growth’ countries, Figure 6 shows that output increased only four to 51 percent over the same period. These countries were Indonesia, Lao PDR, and Timor Leste. Slow growth in Indonesia may be attributed weak domestic demand due to cultural reasons, where *per capita* consumption of pigmeat has in fact been on the decline. However, the positive net exports position of Indonesia, although still relatively small, indicates that growth in demand may be located outside the country, but local production may be facing constraints to respond to these potentials. On the other hand, slow growth in Lao PDR and Timor Leste does not point to slow growth in domestic demand but may indicate the existence of barriers impeding a more rapid domestic production response. For Timor Leste in particular, rather than domestic production picking up, imports of pigmeat have become an increasingly significant source of domestic supply. In general, there needs to be a deeper investigation on the lack of positive response in production in these countries.

Figure 5: Trends in growth of pigmeat production in 'fast growth' countries, 1990-2004 (Index: 1990=100)



Source: FAOSTAT,2006.

Figure 6: Trends in growth of pigmeat production in 'slow growth' countries, 1990-2004 (Index: 1990=100)



Source: FAOSTAT,2006.

Even for the apparently 'high growth' countries, there needs to be a deeper investigation on which production systems were more rapidly responding to growth in demand in the domestic as well as international markets. This is important in establishing whether or not there are links between growth in the sector and poverty reduction among the households that dominantly engage in the activity. Where there are such links, it is important to establish the dynamics of how links these work.

4. Agriculture and Poverty Linkages

Among the SEA and selected Pacific countries, Table 6 shows that there are wide differences on the overall poverty incidence, using the respective national poverty thresholds, with Malaysia and Thailand having the lowest poverty rates. What is generally true, with the exception of Myanmar, is that incidence of poverty is significantly higher in rural than in urban areas. For more that half of the countries represented, the proportion of rural households living below the poverty threshold over the respective years indicated was between 35 and 46 percent. These poverty incidence figures would have changed with more recent information but the structural gap between rural and urban poverty takes time to narrow down.

Table 6: Comparative rural and urban poverty incidence by country (In percent)

Country	Urban	Rural
Southeast Asia		
Malaysia (1999)	3.4	12.4
Thailand (2002)	4.0	12.6
Indonesia (2002)	14.5	21.1
Myanmar '(2000)	23.9	22.4
Viet Nam (1997)	6.6	35.6
Cambodia (1997)	18.2	40.1
Lao PDR (2002)	26.9	41.0
Philippines (1999)	15.0	41.4
Pacific		
Timor-Leste (2001)	26.0	46.0
P.N. Guinea (1996)	16.1	41.3

Source : ADB, 2006

Rural households, in general, depend on agriculture, directly or indirectly, for their livelihood. For more than half of the countries represented in the region, Table 7 shows that between 57 and 82 percent of the total labour force were employed in the agricultural sector.

Table 7: Proportion of labour force employed in agriculture, by country. (In % of the labour force)

Country	Percent
Lao PDR (2003)	82
P.N. Guinea (2005)	72
Myanmar (1997)	63
Cambodia (2004)	60
Viet Nam (2005)	57
Indonesia (2005)	44
Thailand (2005)	43
Philippines (2000)	37

Source: ADB, 2006.

The above figures indicate that for interventions to reduce poverty in these countries, these measures must be undertaken in the locations where the poor are found (predominantly in the rural areas), and must have a positive impact on the economic activities that the poor are already engaged in (predominantly in agriculture). Furthermore, within agriculture, the interventions must focus on the economic activities and sub-sectors that have potential for growth and increased incomes for households engaged in them, directly or indirectly. These would be the agricultural products experiencing significant growth in demand in domestic markets, particularly in the major centres of demand – the urban areas. Such products would generally involve those with relatively higher income elasticity, such as meat and milk, as well as higher-value crops (e.g., fruits and vegetables). The existence of strong consumption and / or production linkages in the economic activities of the rural poor where interventions are targeted would increase the likelihood that interventions made at the production and marketing chain levels bring about sustained increases in incomes of rural households, thereby making headways in rural poverty reduction.

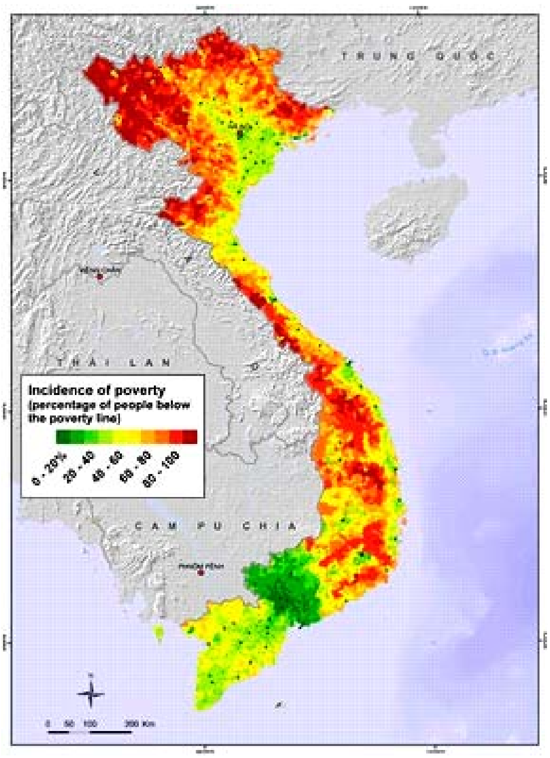
While the initial target markets may be the large urban centres, the significance of smaller towns should not be overlooked, as the consumption linkages created by sectoral growth at the farm and at the rural-to-urban market chain levels can create additional sources of demand growth closer to the production centres. Also, while agricultural products with higher income elasticity would be obvious targets for income generation for rural households, one should not forget that for poorer households both in the rural and urban areas, access to (availability and affordability) basic food staples is a necessary ingredient to poverty alleviation. Improving the productivity and markets of the basic staples sector should not be ignored. Thus, in considering pro-poor intervention strategies involving livestock livelihood of households in the rural areas, one always has to return to the basic framework that livestock is an integrated aspect of the agricultural livelihood of rural households, where the production of staples is a major economic undertaking, rather than a singular specialized activity of pure ‘livestock producers’.

5. The Dynamics of Pro-Poor Livestock Sector Development and Poverty Reduction: The Case of Viet Nam

5.1 Location of the Poor

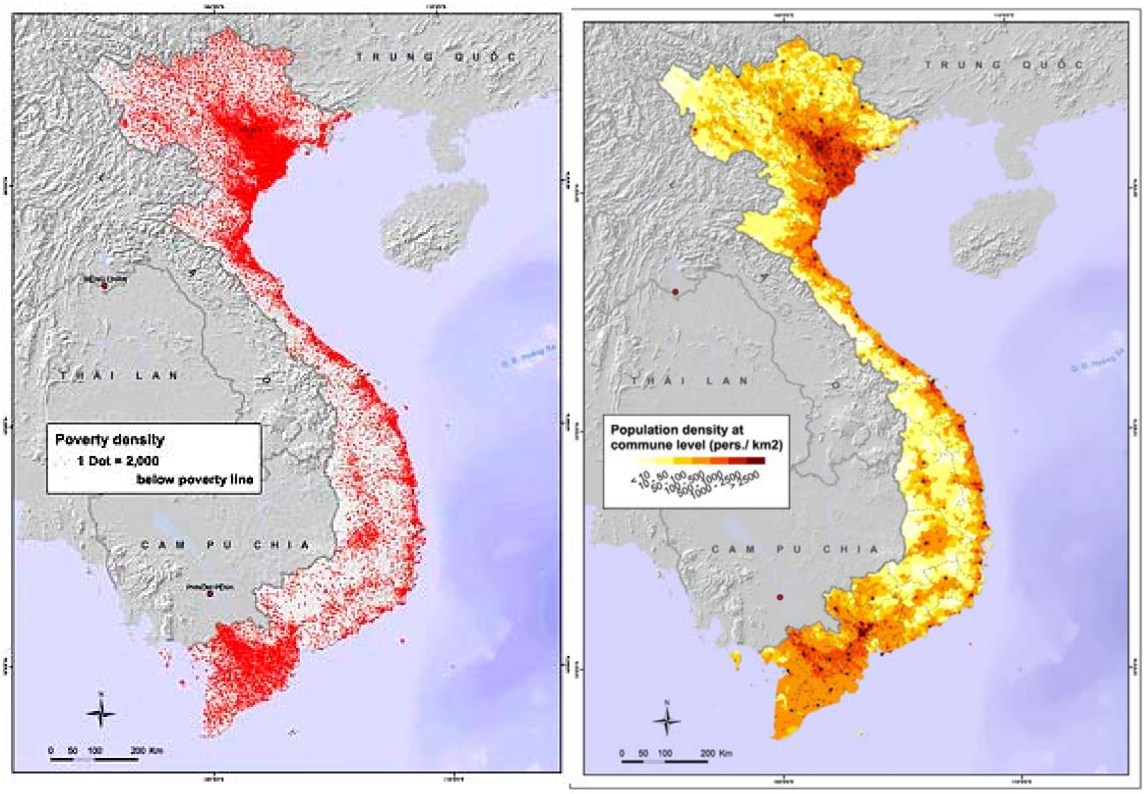
Information on the distribution of poverty across geographic areas in a particular country is a powerful tool in locating poverty alleviation interventions. In the case of Viet Nam, poverty maps generated from such information reveal that poverty incidence is most acute in the Northern Mountain Regions as well as in the Central Highlands, which generally could be described as the more remote rural areas (Figure 7a). On the other hand, poverty density maps show that a greater number of poor households are located in the areas where there are high population concentrations, meaning, in and close to the large urban centres, but more particularly so in the North as compared to the South (Figure 7b). Both maps indicate the two aspects of poverty among households – the static and the dynamic aspects. On the one hand, poverty incidence appears acute in areas with little economic activity and opportunity (remote rural areas). On the other hand, poor households move and gravitate to where economic opportunities exist for them to earn their livelihood, most likely where the economic activities are occurring, in or close to large population centres. Evidently, for the poor in the rural areas, their livelihoods are closely linked to agricultural production activities. For the poor in and around the cities, livelihood opportunities will me more varied, including being engaged in activities along the market chains that link rural production areas to major consumption centres. For the poor in these locations, which may not be engaged in livestock or more general agricultural production activities, an important element of poverty alleviation intervention is the improvement in their real incomes and purchasing power through lower consumer prices of basic staples as well as livestock products.

Figure 7a: Geographic distribution of poverty incidence in Viet Nam, 2002.



Source: VLSS 2002, courtesy M. Epprecht.

Figure 7b: Geographic distribution of poverty density and population density in Viet Nam, 2002.

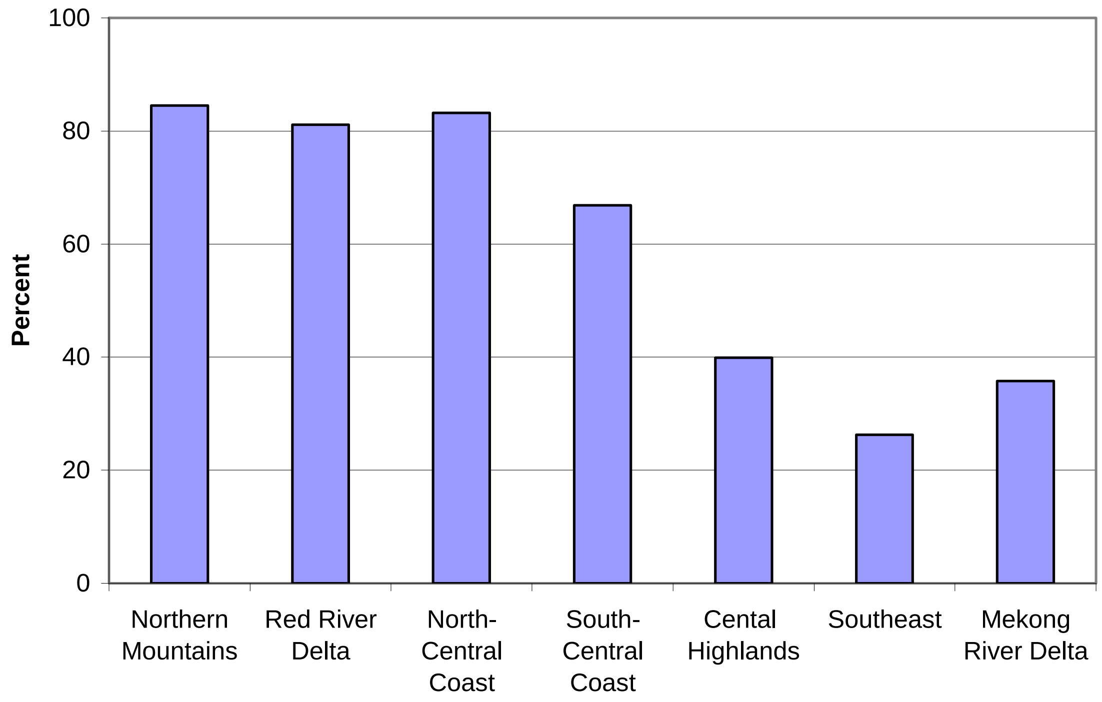


Source: VLSS 2002, courtesy M. Epprecht..

5.2 Pig Production among Rural Households

How relevant is the economic activity of pig production among rural households in Viet Nam? Figure 8 shows that in four of the seven major geographic regions in the country, more than 60 percent of all rural households engage in pig production. Most of these regions are in the north and central parts of Viet Nam. These are the same regions where rural poverty incidence is highest.

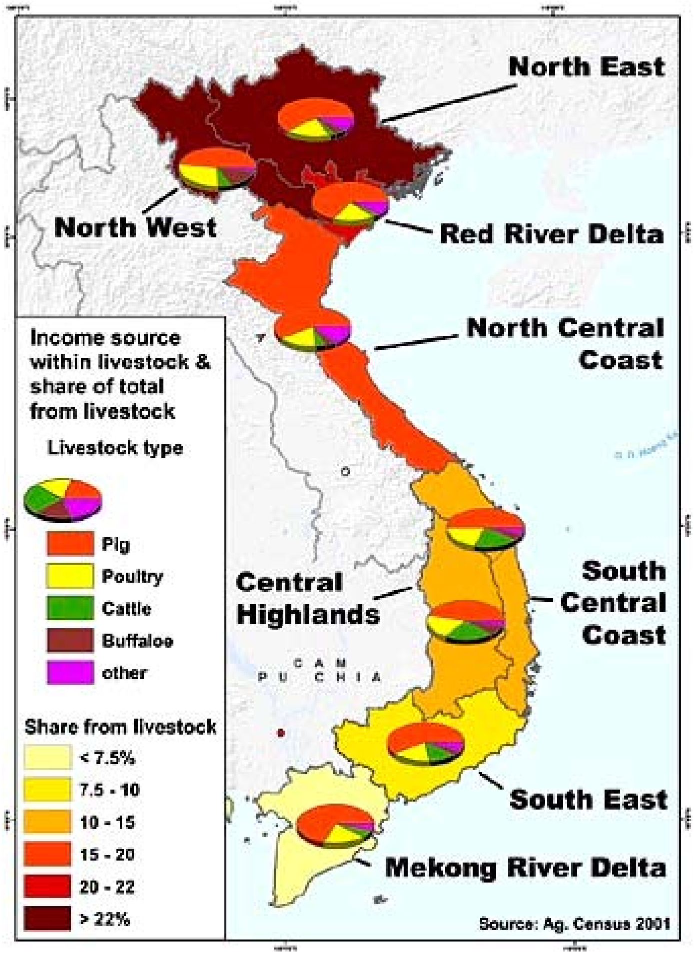
Figure 8: Regional distribution of ownership of pigs by rural households in Viet Nam, 1998
(In percent of households)



Source: VLSS 1998

In these same three regions, income from livestock provides a significant contribution total household income. As shown in Figure 9, this is particularly so in the Northeast, the Northwest and the Red River Delta, where the contribution is of livestock reaches more than 20 percent of household income. Figure 9 also reveals that of total livestock income, income from pigs is the most dominant, with income from pigs constituting more than half of total livestock income in most of the regions.

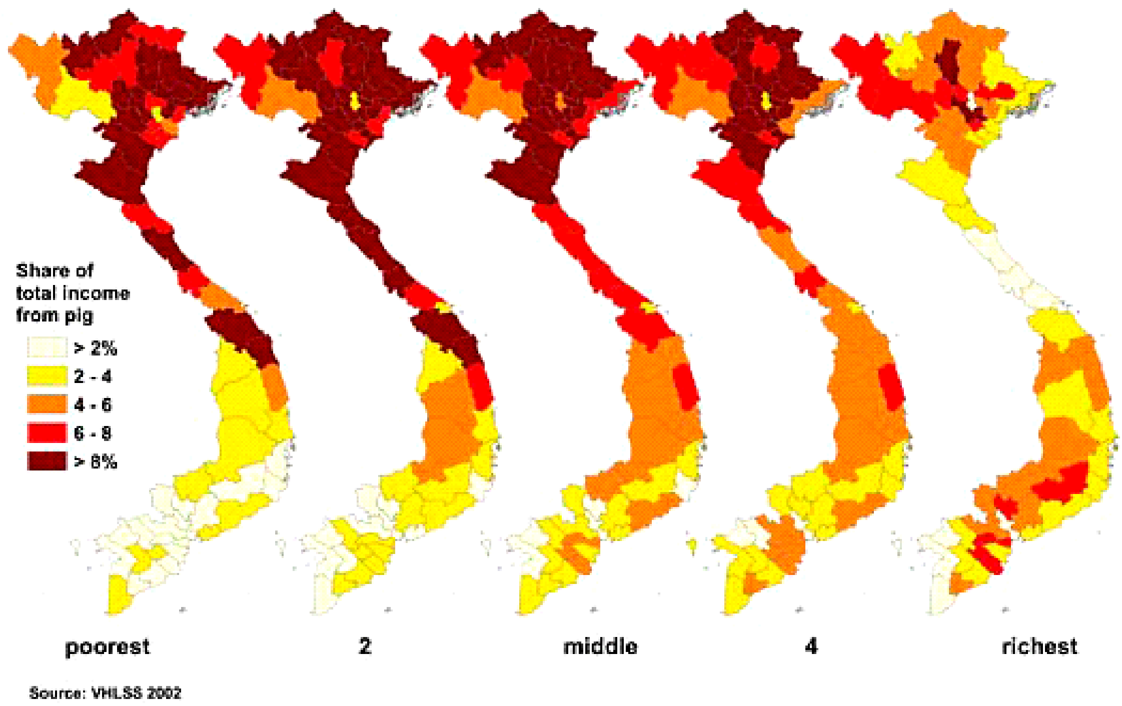
Figure 9: Share of livestock in total income and distribution according to livestock sources, 2001



Source: Agricultural Census 2001

The grouping of households into income quintiles also reveals that there are differences in the relative significance of income from pigs for households in the north and central regions, in contrast to the households in the southern regions of Viet Nam. In Figure 10, there are two general observations that could be made. First is that in general, income from pigs has greater significance to households in the north than in the south. Second, for households in the north and central regions, income from pigs holds greater significance to households belonging to the lower income quintiles (poorer) than to those in the higher income quintiles. In contrast, in the southern regions, income from pigs obtains greater significance to households belonging to the upper income quintiles (richer). The differences in the patterns of relative significance of incomes from pigs among income groups, in the north and in the south, point to the potentially different distributional impacts of a singularly-directed intervention that promotes growth in the pig sub-sector. Furthermore, as there are differences in access to markets and services among pig production systems (e.g., household-based smallholder farms vs. large commercial farms), it matters which production and marketing systems are supported by a single-directed pig sector promotion intervention in anticipating the pattern of distributional impacts of such sectoral intervention.

Figure 10: Distribution of the share of total income from pig, by income quintile and province, 2001



5.3 Typologies of Rural Households and the Integration of Pig Production and other Livestock in Livelihoods

In dealing with the variety of sources of income of rural households in Viet Nam, one could classify households as "Agricultural" (where >50% of total income are derived from agricultural activities) or "Diversifying" (where the income from agriculture is less than 50% of total income). Table 8 shows that the majority of rural households remain to be "Agricultural" (56%), but the proportion of "Diversifying" households is already quite significant. Agricultural households can further be classified as to the extent of market orientation (or the degree of dependence of household income on home production). They could be classified as "Subsistence" oriented (>75% home produced), "Semi-commercial" (25-75% home produced), or "Commercial" oriented (<25% home produced). It is important to note that the majority (close to 60%) of agricultural households are already integrated into markets but not yet intensively commercialized. This has an important bearing on the direction of interventions that are aimed at reducing poverty among rural households in Viet Nam.

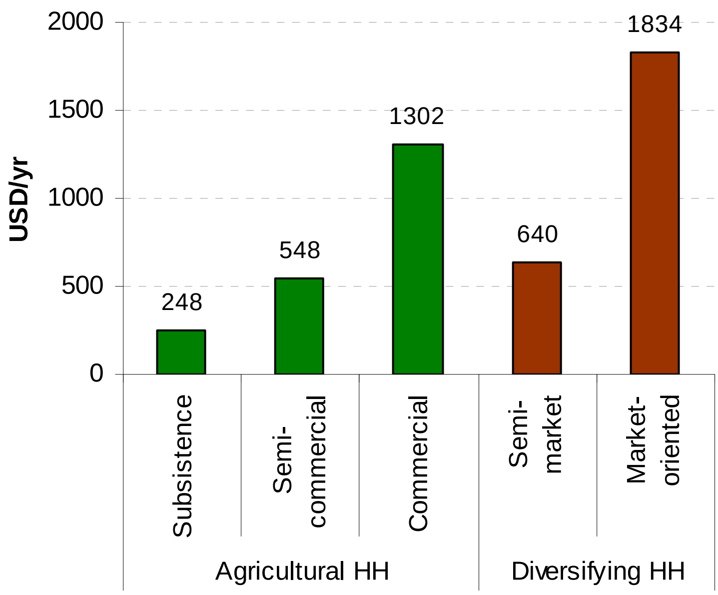
Table 8: Distribution of rural households by livelihood categories and market orientation (In percent of sample)

HH Category	Market Orientation	Proportion of HH (%)
Agricultural	Subsistence (>75% home produced)	6.1
	Semi-commercial (25-75% marketed)	33.0
	Commercial (>75% marketed)	16.5
	Sub-total	**55.6**
Diversifying	Semi-market (>25% home produced)	9.5
	Market-oriented (<25% home produced)	34.8
	Sub-total	**44.3**
All households		**100.0**

Source: Maltsoglou *et al.*, 2005.

The degree of engagement in markets has a bearing on household income opportunities. Figure 11 reveals that within both categories of households (Agricultural and Diversifying), the groups with higher market orientation had higher mean household incomes. The most market-oriented households had mean incomes that were more than double the incomes of less market oriented households. Thus, among rural households in Viet Nam, the level of household incomes have more to do with the strength of their linkage to markets rather than on them being simply “Agricultural” or “Diversifying” households.

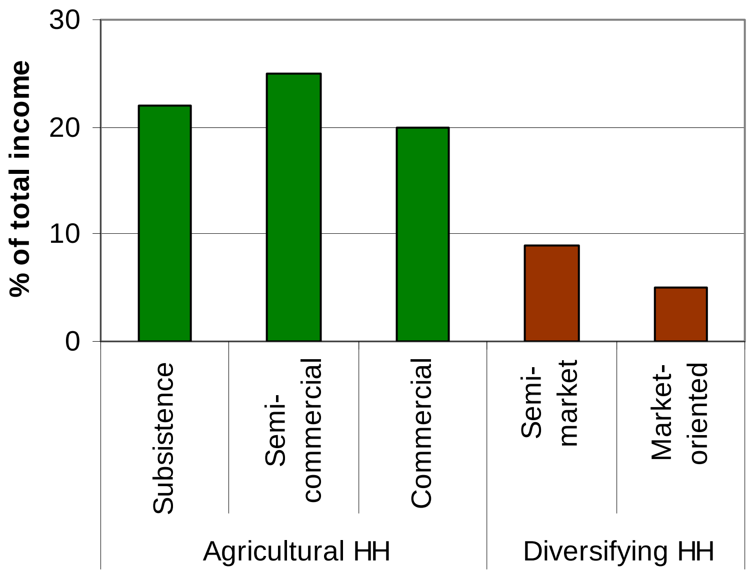
Figure 11: Comparative household income levels by HH category and market orientation (In USD/yr)



Source: Maltsoglou *et al.*, 2005.

Livestock production has varying degrees of importance among rural households. Figure 12 shows that in rural Viet Nam, income from livestock has greater significance among "Agricultural" households (ranging between 20 to 25 percent of total income) than among "Diversifying" households. This validates the status of livestock livelihood as integrated into whole agricultural livelihood of the rural household, rather than as a singular specialized livelihood of livestock households.

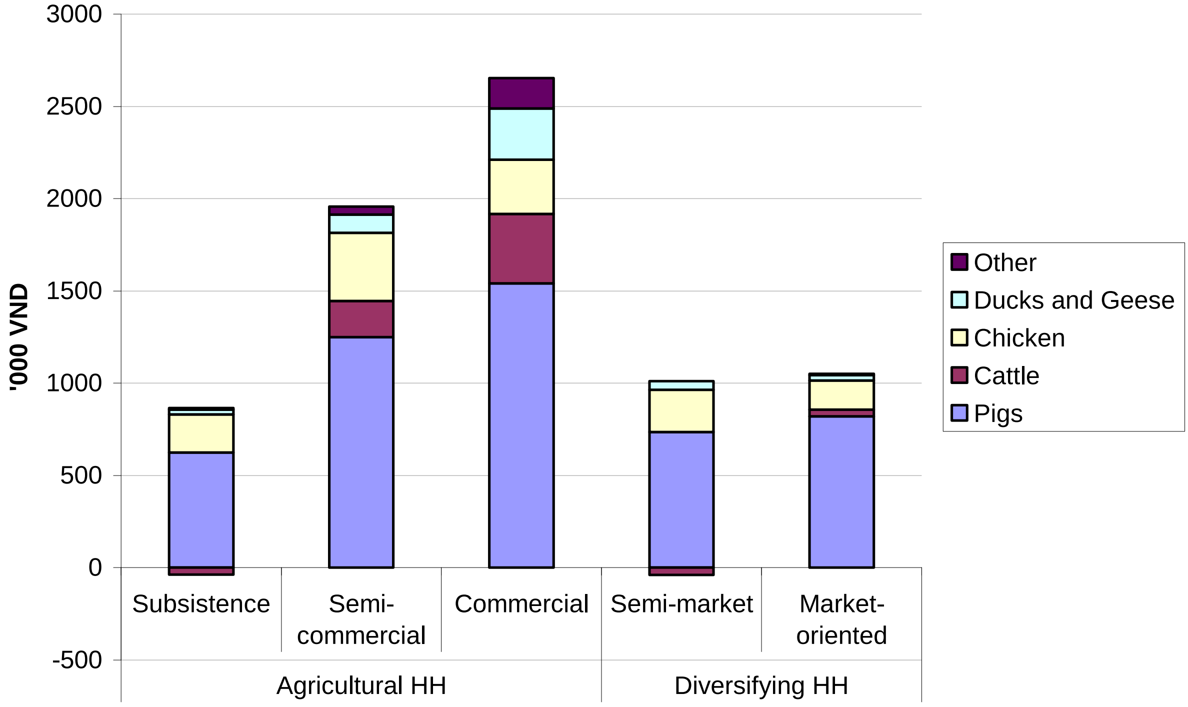
Figure 12: Share of livestock in total income, by HH category and market orientation (In percent of total income)



Source: Maltsoglou *et al*., 2005

Various livestock species have different degrees of importance as contributors to livestock income of rural households. Figure 13 shows that for both "Agricultural" and "Diversifying" households, income from pigs dominates as contributor to livestock income. The same figure, however, also shows that the degree of market orientation has a more telling impact on livestock income among "Agricultural" households than for "Diversifying" households. Particularly among "Agricultural" households, the greater the market orientation, the higher the mean income from pigs, and consequently, higher overall income from livestock. Subsistence-oriented households depend more on pigs and chicken as source of livestock income. As "Agricultural" households become more commercialized, income from livestock also becomes more diversified.

Figure 13: Value of livestock income from various livestock species, by HH category and market orientation. (In '000VND/yr)



Source: Maltsoglou *et al*., 2005

From the configuration of rural households, it can be asserted that the impact of livestock sector interventions would largely benefit "Agricultural" households rather than on "Diversifying" households. Within the category of "Agricultural" households, as the largest proportion belong to the group of "Semi-commercial" households (59%), the type of intervention in the livestock sector that would have the widest coverage would be one that would have the impact of improving the terms of exchange of those already extensively participate in markets, and move them to a more gainful intensive engagement. Such more intensive engagement is exemplified by the 30 percent "Commercially oriented" farm households that were earning more than twice as much income as their "Semi-commercial" counterparts. Policy and institutional interventions that address, as broadly as possible, the market barriers to pig production and trade that "Semi-commercial" farm households face, and would improve their terms of trade, would most likely also benefit the already quite "Commercially-oriented" group. This should not necessarily pose a distributional problem as the wider the coverage of the positive impacts, the wider the direct income improvement effects, the more extensive also the secondary income effects, and the stronger would be the poverty reduction impacts. For subsistence-oriented agricultural households, improving the terms of trade would have an impact only on their incomes arising from their small proportion of marketed output. Alternative measures of direct poverty alleviation that would enhance the capacities and limitations of these households would be more suitable measures than pure market improvements.

5.4 Directions for Intervention in the Livestock Sector for Poverty Reduction in Viet Nam

When the objective of poverty reduction is an explicit dimension of policy, intervention in the livestock sector must be viewed within the whole agricultural livelihood configuration of rural households in Viet Nam, not as isolated sectoral interventions. A significant piece of information to take note of is that more that 60 percent of household income comes from marketed agriculture, as shown in Table 9. The market linkage is essential, as seen in the differences in total mean income levels of “Commercial oriented” agricultural households as compared to “Subsistence oriented” and “Semi-commercial” households, and more particularly the significant difference in the levels of livestock income between the “Commercial” and “Semi-commercial” households on the one hand, and the “Subsistence oriented” households on the other. The importance of market linkage is even more evident in pig production as among the three agriculture household types, between 94 to 99 percent of the value of all pig produced is derived from sold output (2002 VLSS).

Table 9: Sources of income of rural households in Viet Nam, 2002 (In percent)

Income Source	Share (%)
Marketed Agriculture	62
Self-employment	18
Wages	9
Other	11
Total	100

Source: VLSS 2002

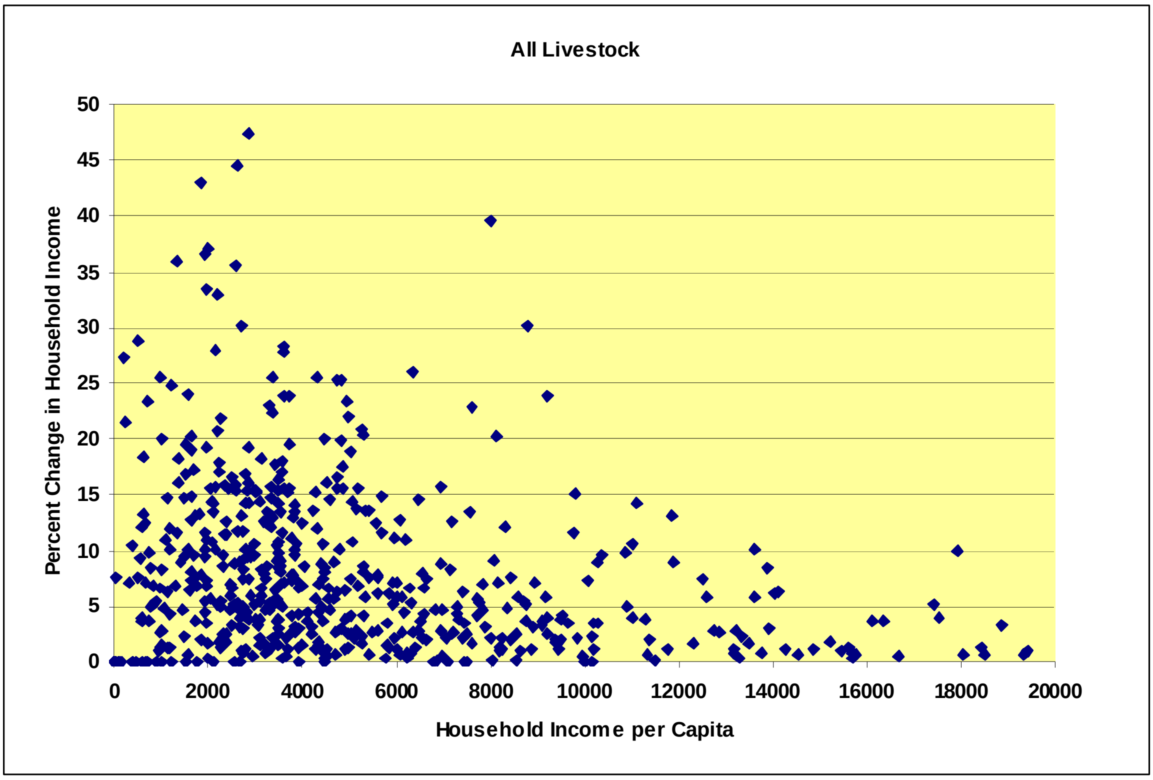
For agricultural households, the income from marketed agriculture depends on a complex of market supply chains extending from the farm gate to urban households, and to some extent, even to foreign households as in the case of pig production in Viet Nam. Increasing marketed income from livestock is not just a matter of increasing pig holdings or improving their physical productivity. These additional livestock holdings must earn positive net returns from market engagement (i.e., not traded at a loss). The income generating capacity of household investments in livestock depends to a large extent on the terms of trade that farmers get in their linkage with markets. PPLPI research on these linkages indicates that the terms of participation are still far from achieving their potential to help the rural poor (Roland-Holst *et al.*, 2006). Understanding these complex linkages require investigation into the nature of barriers at work that worsen these terms of market participation, and on the impacts of these are along the market supply chains.

Microeconomic fundamentals assert that in broad terms, the terms of market participation of rural producers can be improved by measures that impact on either the revenue or cost side, or both, of the balance sheet of these market participants. The revenue side could be improved either by an increase in the volume of marketed output or an increase in the farm gate value (price) per unit of output. On the cost side, the terms of participation are improved when measures undertaken lead to a reduction in the cost per unit of output marketed. The income improvement and poverty reduction impacts of interventions that improve the terms of trade of market participants is magnified when the positive impacts filter through to market participants at various stages along the market supply chains.

5.5 The Pro-Poor Impacts of Livestock Policy Change

The configuration of engagement in livestock of various types of households has a bearing on the distributional impact of policy change in the livestock sector. The previous section revealed that income from livestock has a relatively larger significance to incomes of lower income households in general, and among lower income agriculture-dependent households in the rural areas in particular. Also, the level of market engagement of agricultural households has a direct bearing on the level of their livestock incomes. Taking into consideration their respective current levels of market engagement, as well as the inter-sectoral linkages of the livestock sub-sector, simulation experiments on the distributional impact of a generic livestock promotion policy change that improves livestock productivity growth by seven (7) percent annually, show that in general, poorer households would realize greater relative income improvements than would wealthier households (Roland-Holst *et al*., 2006). The spread of relative changes in household incomes across households is shown on Figure 14. Thus, interventions in the livestock sector, as they work through the market chains, that improve the livelihood of rural households at the farm and along these chains, will have direct impacts in poverty reduction in Viet Nam.

Figure 14: Distribution of impact of a 7-percent annual increase in livestock productivity on households, by income levels.



Source: Roland-Holst *et al*., 2006

6. Conclusion

The demand for livestock products has exhibited a fairly rapid growth in Southeast Asia and The Pacific. For pigmeat in particular, demand has also shown a similar strong growth, with the exception of the predominantly Muslim countries of Malaysia and Indonesia. At the macro level, the pig sector in the respective countries of Southeast Asia and The Pacific have exhibited different responses to growth in demand, with majority also exhibiting rapid growth in output, but with a few countries showing slow growth or stagnation.

The sectoral response to increasing demand for livestock products in general depends on the strength of market linkage between rural producers and the mainstream urban markets for these products, and even with external markets where these are present.

Livelihood from livestock is a significant component of total household income, particularly for the lower income households, as exemplified in Viet Nam. Most agricultural households are linked to markets for their produce, and derive the larger part of their household income from such market engagement, although at varying intensities, with the degree of market linkage positively related to the level of income from livestock, as well as to total household income, particularly for rural agricultural households.

Pure technical interventions the increase livestock holdings or physical productivity at the farm level may not automatically result to improved incomes of rural households engaged in livestock. Livestock keepers must be able to gain positive net returns from marketing their surplus livestock, otherwise, the incurring of losses due to market engagement would lead them deeper into indebtedness. Strengthening the market linkages in a way that improves their terms of trade for the livestock products of rural agricultural households has significant potentials in improving the incomes of rural households with livestock livelihood, and in reducing poverty.

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