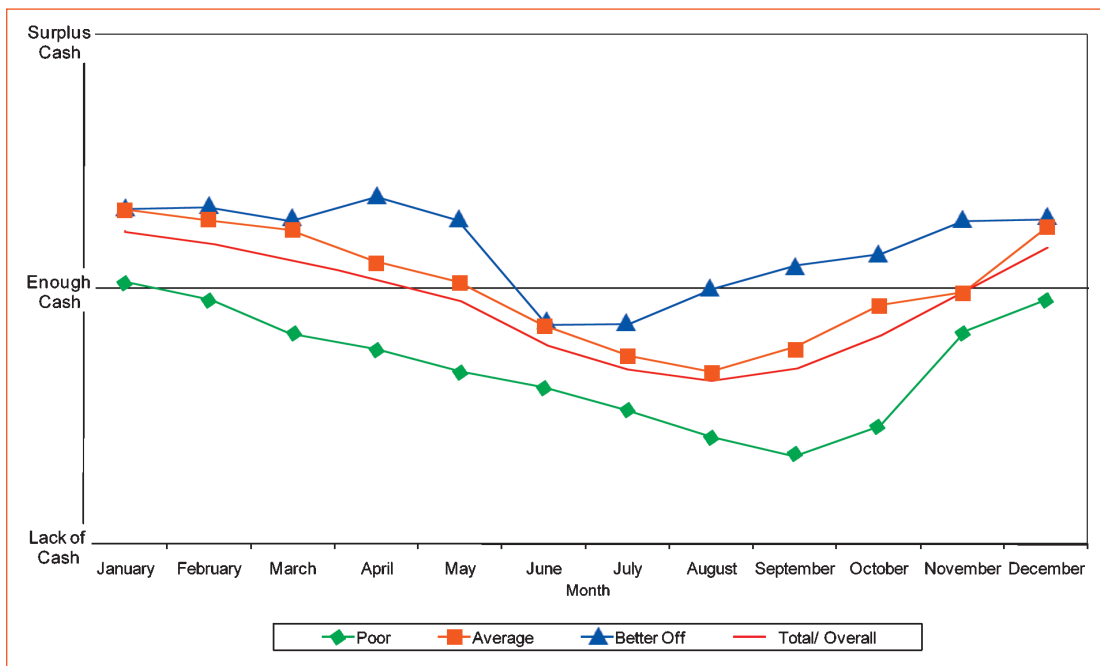


Figure 19: Monthly cash constraint by wealth category



Source: (UNDP and NERI 2005)

Step 6 Appraising the place of income in livelihood strategies

It is important to consider the place of income generated by the value chain in total household incomes. Due to income diversification strategies, the income brought by one value chain may be only a small fraction of a household's total. The share of income represented by the value chain should be calculated in order to accurately model livelihoods and livelihood responses.

In the example previously of street vendors in Hanoi and peri-urban agriculture in Africa, the business represented more than 90% of cash income of the household, which means that an improvement of the income generated by the value chain will have significant impact on the family incomes. Therefore, the participants in the value chain will be particularly willing to invest their energy in the upgrading of the value chain, which may not be the case if the commodity had a more minor contribution to the household income.

In the example in Box 30 below, the contribution of different household activities to total household livelihood is calculated using a survey questionnaire. It is important to distinguish between activities that derive income (through cash sales) and those that are carried out for household consumption purposes.

Box 30: Extract of survey questionnaire on calculating household income

Weighting Activities

Get the farmer to list all farm and non-farm activities and sources of income and livelihood. Put them into the categories below. Using 100 seeds, ask the farmer to partition and weight each activity between what the household consumes/uses and what is either sold for income or kept as capital accumulation. For example, livestock is typically kept for capital accumulation and draught power purposes (own use). After the farmer has finished weighting review the results with the farmer. Do pair-wise comparisons between the cells, asking the farmer to verify that the relative weightings are correct. Some common problem that arise:

- Farmers giving a “consumption” weighting to off-farm labour or salaries (people can’t “eat” labour).
- Farmers weighting activities between income and consumption, but not between activities.

Farm and non-farm activities		Weighting	
		Income and capital accumulation	Consumption / Own Use
C.1	Rice	___%	___%
C.2	Root and Tuber Crops (cassava, potato etc)	___%	___%
C.3	Upland Crops (maize, other cereals, legumes etc)	___%	___%
C.4	Vegetables	___%	___%
C.5	Perennial Crops (rubber, coffee, pepper etc)	___%	___%
C.6	Annual Industrial Crops (Sugarcane, Cotton, etc)	___%	___%
C.7	Fruit Trees	___%	___%
C.8	Fishing and Aquaculture	___%	___%
C.9	Small livestock (poultry, pigs, goats, etc)	___%	___%
C.10	Large Livestock (Cattle, buffalo, etc)	___%	___%
C.11	Non-Timber Forest Products	___%	___%
C.12	Forest Products	___%	___%
C.13	Other Farm Activities	___%	___%
C.14	Handicrafts and Weaving	___%	___%
C.15	Off-Farm Work and Remittances	___%	___%
		Check Sum Total=100%	

Valuing Activities

Identify the activity with the highest income weighting. Ask the farmer to estimate what the value of that activity was in terms of sales. Reconfirm the relative weightings of each activity for the Income column in terms of value. Calculate total Farm Income below.

Farm and non-farm activity		Income and capital accumulation Value (in Local Currency)	Weighting (From Above)
C.16		(A)	% (B)
C.17	TOTAL FARM INCOME (Cash and Consumption)	=A/B*100	100%

Once total Farm Income has been calculated, the percentages for each activity can be then re-calculated into monetary value for comparison between farmers.

Source: (UNDP and NERI 2005)

The results of the above survey can be averaged across categories of respondents and then re-calculated in % terms for comparison purposes². In the example in Table 36 below, focusing on the cash returns alone results in the conclusion that off-farm work and remittances are the most important income sources. This is followed by small livestock production and upland crops whereas rice is clearly the most important activity after own consumption is factored in.

Table 36: Source of farm family incomes in Lao PDR - average percentage reported

Farm and Non-farm Activities	Overall			Total by Income Group		
	Income and Capital Accumulation	Consumption /Own Use	Total	Poor	Average	Better-Off
Rice	4.4	24.0	28.4	34.7	27.1	27.1
Root and Tuber Crops (cassava, potato etc)	0.2	0.6	0.8	1.1	0.8	0.8
Upland Crops (maize, other cereals, legumes etc)	5.7	3.1	8.8	12.7	8.1	8.1
Vegetables	5.5	2.5	7.9	8.2	8.6	8.6
Perennial Crops (rubber, coffee, pepper etc)	0.9	1.0	1.9	1.0	2.4	2.4
Annual Industrial Crops (Sugarcane, Cotton, etc)	0.1	0.3	0.4	0.7	0.3	0.3
Fruit Trees	2.4	1.3	3.7	2.6	3.8	3.8
Fishing and Aquaculture	0.8	0.3	1.1	0.0	1.8	1.8
Small livestock (poultry, pigs, goats, etc)	5.9	3.9	9.8	6.8	10.6	10.6
Large Livestock (Cattle, buffalo, etc)	3.5	2.3	5.7	2.5	6.5	6.5
Non-Timber Forest Products	2.7	0.9	3.6	5.4	3.2	3.2
Forest Products	1.5	0.6	2.1	3.2	1.7	1.7
Other Farm Activities	0.8	0.9	1.8	2.9	1.6	1.6
Handicrafts and Weaving	0.8	0.2	1.0	1.2	0.9	0.9
Off-Farm Work and Remittances	20.4	2.5	23.0	17.0	22.5	22.5
Total	55.7	44.3	100.0	100.0	100.0	100.0

Source: (UNDP and NERI 2005)

Traders are also likely to have multiple income sources. One trader may be involved in maize, cassava, and soybeans either simultaneously or on a seasonal basis. This means that decisions to participate in any particular value chain are contingent on factors which could be outside the single value chain. For example, a trader may decide to liquidate maize stocks at a loss rather than wait for an imminent price rise if he has to use the storage space and cash liquidity to engage in the upcoming soybean season.

² It is important to recognize that just using percentages will not allow a comparison across different groups, as all income sources add up to 100%. The data need to be converted into USD values and then averaged within stratification groups. Once averages (means) have been calculated, these can then be converted back into percentages for comparison between groups.

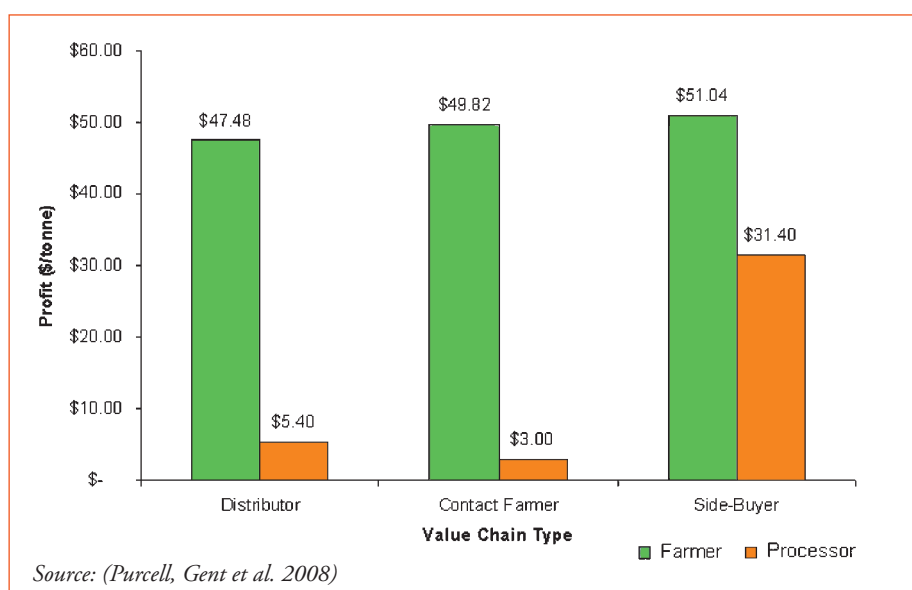
Step 7 Comparing incomes across different value chains

The comparison of incomes generated by different value chains characterised by different governance structures or different upgrading strategies (the two being often related) enables recommendations regarding the promotion of governance and upgrading which generates the highest incomes and/or the most balanced ones across different actors. For instance an analysis of an aromatic-rice value chain in Vietnam shows that the association-driven chain, with the labelling of aromatic rice by a farmers’ association and sales to supermarkets, generates more income to the farmers than the traditional chain (Binh, Huan et al. 2005).

A researcher may wish to compare incomes across different value chains, such as within a commodity but across different governance structures, or across commodities (value chains) within a particular area. It is important to recognise that comparing different value chains in different areas without considering the different agro-ecological systems (for production) or the different technologies available (low technology milling versus high technology milling) may result in incorrect conclusions.

For the first case, comparing across different governance structures, the following example shows profit margins for producers and processors across three different value chain governance systems for cotton in Zambia. The first governance system is called the Distributor System. This system follows a Principle-Agent model of organisation where the processor makes contracts with traders who are then responsible for the distribution of inputs and services and the collection of the crop. The second governance system is called the Contact Farmer System where the processor has a system of field agents and extension advisors who are employees of the company. The third governance system is a Side-Buyer System where the processor does not invest in providing inputs or services to farmers but relies on attracting farmers currently under the two other systems to renege on their contracts by offering a slightly higher price.

Figure 20: Comparison of profit margins across governance systems in cotton in Zambia



The analysis shows that farmers are better off in the side-buyer value chain as the profits are slightly higher than the other two systems. However, as the discussion in Value Chain Toolbook - Part Three (Tool 3) indicates, such a strategy may not be sustainable in the long run as it could force the other governance systems out of the market and farmers would lose the advantages of having their inputs and services provided by the lead firms. The analysis also shows that while the side-buyer processor has the greatest profit (since they do not have to spend any money on inputs or extension), the distributor model is more profitable than the Contact Farmer model since the Contact Farmer processor has to spend their own money on the logistics of providing inputs and services as well as collection of the harvest.

Comparing the incomes in the value chains before and after upgrading is also a good way to assess the economic impact of value chain upgrading. Yet it is often difficult and time-consuming to carry out “before” and “after” evaluation, and comparing “with” and “without” situation at the same period of time, for different actors, is generally more feasible.

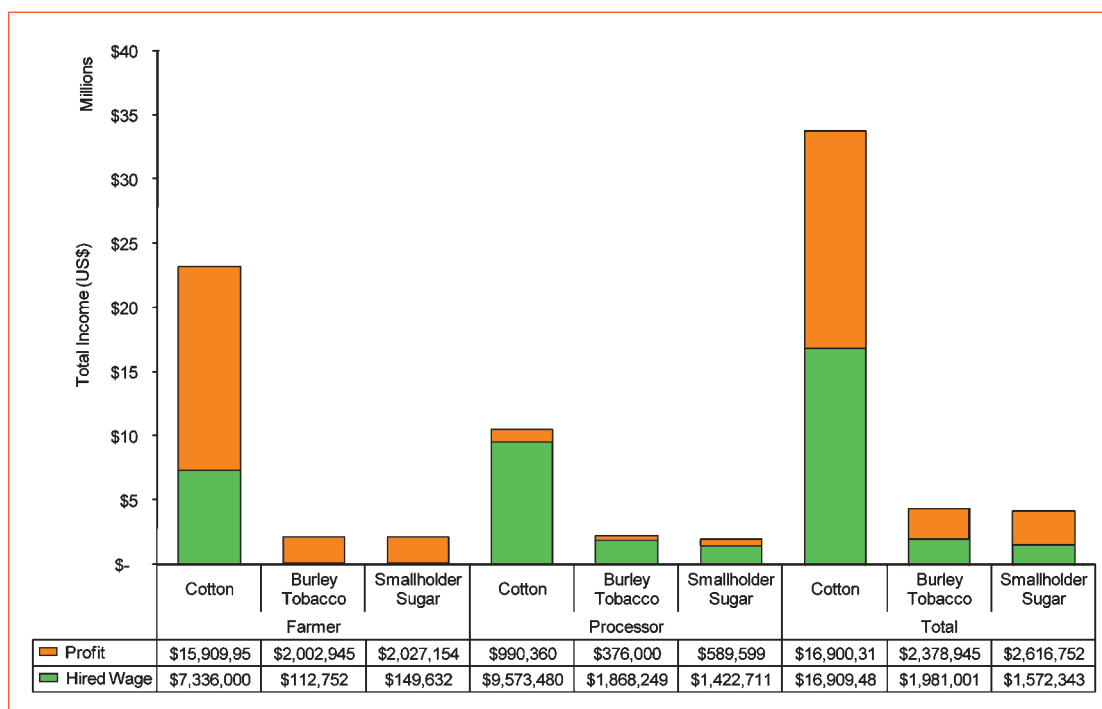
Similarly, comparing incomes across value chains is a good indicator of alternative activities which households could undertake. In the example below, the value chains for five different sectors in Zambia are compared for employment and income. The results indicate that sugarcane and export horticulture value chains are the two chains with the highest income per capita; the domestic horticulture and cotton chains have the two lowest incomes per capita. This suggests that interventions to get greater numbers of people into the sugarcane and export horticulture chain would have the most benefit. However, a deeper analysis of the five chains suggest that barriers to entry for these two chains are significant (hence their greater returns) and that improvements in the cotton and domestic horticulture chain would yield more significant benefits, and impact on more households.

Table 37: Income distribution and employment across value chains in Zambia

Value Chain	Sector Earnings (USD million)	Wage Employment	Small Farmers	Earnings per Person (USD/day)
Cotton	81	2,300	280,000	1.30
Tobacco	63	92,000	23,000	2.49
Sugarcane	65	4,000	1,692	51.91
Export Horticulture	55	14,500	2,500	14.71
Domestic Horticulture	116	10,000	525,406	0.98

Source: (Purcell, Gent et al. 2008)

Figure 21: Income distribution and employment across value chains in Zambia



Source: (Purcell, Gent et al. 2008)

5. What Should be Known after Analysis is Complete

After having followed all the steps it should be possible to answer the key questions outlined below:

- Are there differences in incomes within and between different levels of the value chain?
- What is the impact of various governance systems on income distribution between and within various levels of the value chain?
- What are the impacts of the distributional outcomes of the value chain on the poor and other disadvantaged groups, both currently and into the future?
- What are the changes in incomes that result from the development of various types of value chains?
- What is the variability of incomes and risks to livelihoods within and between various levels of the value chain?

Useful Examples

Example 5: Differences between the distribution of unit profits and incomes.

Moustier et al (2006) assessed the distribution of costs and profits* between the different actors of the following off-season tomato chains in Northern Vietnam:

- Among the different value chain actors, it is the collectors and wholesalers selling vegetables of Moc Chau who get the highest incomes. This is due to the large quantities traded as their profits per kg are smaller than other actors; e.g., 19-5 Cooperative and Van Tri Cooperative (for tomato, 105 ton/year for collectors, 132 ton/year for wholesaler, 6 ton/year for Bao Ha, 13 ton/year for 19-5, 12 ton/year for Van Tri). It is worth investigating the reasons behind these differences in quantities traded. It may be a function of the number of years in the business, or the fact that the cooperatives prefer the reliability of their suppliers in terms of product quality rather than the number of suppliers and their large scale.
- Compared with the other actors, supermarkets get relatively low margins (less than 20% of final price, while the farmer's margin is more than 25%);
- Selling to supermarkets does not bring more income to farmers than selling to safe vegetable shops, even though the retail price is 20% higher. The price difference is distributed into increased profits for the assembling and distribution cooperatives (Van Tri, Van Noi) and company (Bao Ha), and into the supermarket margin. Compared with safe vegetable shops, supermarkets represent more constraints for their suppliers, in particular as regards the possibility of returned products.

Note: in this calculation, we assume that the actors get the same profit per kg for all vegetables traded; therefore, the figures of total incomes should be taken for comparison rather than in absolute terms.

* Profits = Sales revenue – Cash costs – Depreciation (see Tool 6 - Analysing Costs and Margins).

Table 38: Estimation of incomes of various actors of the vegetable chains (USD)

	Tomato			All commodities	
	Profit/kg	Qty/year	Income/year	Qty/year	Income/year
Farmers Moc Chau inside coop	0,06	3340	203,18	9200	559,67
Collectors Moc Chau (local)	0,02	2100	42,94	13440	274,83
19-5 Cooperative	0,01	12600	129,23	500000	5128,21
Van Tri Cooperative	0,04	11900	530,16	612000	27265,38
Farmers Moc Chau outside coop	0,06	8400	474,38	15000	847,12
Collector Moc Chau (to Hanoi)	0,02	105000	2147,12	105000	2147,12
Wholesaler Hadong	0,02	132000	3206,92	148000	3595,64
Farmer Soc Son	0,14	2374	322,77	8700	1182,87
Collector Soc Son	0,04	20130	771,65	82500	3162,50
Company Bao Ha	0,03	5610	150,32	132000	3536,92
Safe vegetable shop	0,02	3400	78,24	40800	938,92

Source: (Moustier, Anh et al. 2006)

Example 6: Unit profits and incomes along the value chain for onions.

The analysis of distribution of incomes among actors in the onion value chain from Niger to Ivory Coast in 1995 shows that incomes are higher by far for urban wholesalers, and lower for producers and retailers, even though the retail stage has the highest profit per kg.

A significant part of wholesalers' incomes is actually distributed to other actors of the chain in the form of gifts, in kind and cash, to help them in difficult times.

Table 39: Distribution of incomes from onion production in Niger to retail sale in Abidjan in 1995

	Number of actors	Tons/Actor	Sales price (USD/kilo)	Costs/kilo (apart from	Profit/Kilo/actors (purchase price)	Total income/actors/year (USD)
Producers		4	0.14	0.04	0.10	400
Assemblers	6950	1565	0.16	0.01	0.01	12520
Mobile wholesalers	15	703	0.30	0.13	0.01	8436
Urban wholesalers	30	1984	0.38	0.02	0.07	134912
Semi-wholesalers	175	113	0.53	0.02	0.13	14238
Retailers	11200	2	0.95	0.04	0.37	744

Source: (Moustier and Zebus 2002)

Tool 8 - Analysing Employment Distribution

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Tool 8 - Analysing Employment Distribution

1. Introduction

As with income distribution, analysing the distribution of employment within the value chain is central to understanding how to increase the participation of the poor. Understanding how employment is distributed along the chain provides the necessary start to determine opportunities for employment generation. The distribution of employment and access to employment by different wealth classes can be analysed to identify employment opportunities. See also the mapping suggestions in Value Chain Toolbook - Part Two (Tool 2) for visual representations of employment distributions.

Analysing distribution of employment is not only an analysis within a particular value chain but also recognises that individual actors participate in a number of different value chains at the same time. For example, a farmer may be involved in several agricultural crops and several handicraft activities as a means of income diversification. In the same way a trader might be involved in trading multiple agricultural products at the same time or at different times depending on the season. Therefore, livelihood strategies made by various actors are influenced by labour constraints and any analysis must take this into account.

The second part of this tool looks at whether there is room for improvement in the distribution of labour and how this can be done, taking into account seasonality in demand and availability of labour and also the competitiveness between labour intensive and labour saving upgrading strategies.

2. Objectives

1. To analyse the impact of the value chain on the distribution of employment within and between various levels of the value chain at the level of the individual actors.
2. To describe distribution of employment along the value chain and amongst the different wealth classes; and determine how the poor and other disadvantaged groups participate in the chain.
3. To describe the dynamics of employment within and along the value chain and the inclusion and exclusion of the poor and other disadvantaged groups.
4. To analyse the impact of different value chain governance systems on employment distribution.
5. To analyse the impact of different value chain upgrading strategies on employment distribution.

3. Key Questions

- What are the differences in employment within and between different levels of the value chain?
- What is the impact of the employment distribution of the value chain on the poor and other disadvantaged groups, both currently and in the future?
- What are the changes in employment that result from the development of various types of value chains?

4

- What is the variability of employment and risks to livelihoods within and between various levels of the value chain?
- What is the impact of various governance systems on employment distribution between and within various levels of the value chain?
- What is the impact of various value chain upgrading strategies on employment distribution between and within various levels of the value chain?

Pro-poor dimensions in the distribution of employment are:

- What are the opportunities / barriers for the poor to find employment in the value chain?
- Is it more interesting for the farmer to work on his own farm or switch to wage labour within or outside the chain?
- Which age groups do have the chance to access employment?

4. Steps

Step 1 Define the categories of actors

To analyse employment distribution within a value chain it is important to first categorise actors. The mapping of the value chain as discussed in Value Chain Toolbook - Part Two (Tool 2) provides a map of actors within categories and this can be used as a basis to add employment specific information.

There can be different types of farmers, collectors, wholesalers and retailers. As was the case with defining the categories for income levels along a value chain in Value Chain Toolbook - Part Four (Tool 7), the most important categorisation for pro-poor value chain analysis is based on income levels (a distinction between poor and non-poor actors).

For example, for flower retailers in Hanoi (Vietnam) there are at least three different broad categories; hawker, retailers in open air markets, and retailers in their own flower shops. These retailer categories are very much related to the different wealth levels, with hawkers being the poorest. Other examples of categories that could be used are presented in Box 31 below.

Box 31: Examples of other categories of actors

Categories	Dimensions
Skills	Unskilled, low-skilled, high-skilled
Gender	Male or female
Ethnicity	Different ethnic types
Business Type	Micro, small, medium, large
Period	Day labour, temporary labour, permanent labour
Status	Family, hired
Origin	Temporary migrant, permanent migrant, locally hired

Take Note



Within specific groups it may be important to look at age distribution. For example, in rural Vietnam it is becoming obvious that the average age of farmers is increasing because younger people find it easier and more attractive to find employment elsewhere. Even if employment opportunities exist this does not mean it is open to each age group, gender or social group.

Step 2 Determining employment at each level

By comparing the distribution of employment across each level of the value chain a comparison of opportunities for the poor at various levels of the chain can be made. This is complementary to the analysis of the incomes accruing at each level of the chain.

Employment at each level of the value chain can be determined in different ways:

1. **Wholesalers:** Conducting a survey of wholesalers is generally not too time-consuming. Be aware of seasonal variations; in the off season the number of wholesalers is much smaller than in the main season.
2. **Retailers:** Based on the total traded volume of a product in a value chain and the daily turnover of a retailer one can calculate how many retailers are involved. But if additional time is available count all retailers in a sample area (e.g. open air market retailers) and then apply the figures to calculate the retailers in a total area. For example, count the total number of open air markets in a city (e.g. 130) and then take a random sample of various open air markets (e.g. 15). Visit these open air markets, count the number of retailers in these markets or ask the market administrator (if present) how many booths he rents out. Calculate the average number of retailers per open air market and multiply by 130 to get a rough estimate.
3. **Transporters:** Estimate the total volume of sales, and the typical volume per transport unit (e.g. trucks, motorbike, carts, boats). Then estimate the number of people required per transport unit, the time required to transport, and the number of full time equivalent employees (FTEs) this generates.
4. **Processors:** Identify the number of processors in an area from official sources (e.g. registration certificates); identify the number of informal processors from key informant interviews.
5. **Collectors:** Conduct interviews with village leaders or commune heads. Estimate the number of collectors under each trader/wholesaler. Estimate the total volume of sales, and the typical volume per transport unit. Then estimate the number of people required per transport unit, the time required to transport, and the number of FTEs this generates.
6. **Farmers:** Estimate the number of farmers based on hectareage under each crop and yields (related to traded volumes). Cross check with district authorities for official figures. Obtain information on sales of key inputs sold by input providers at bottleneck points (e.g. seed). Be sure to distinguish between smallholders and commercial farmers.

7. **Hired labourers:** Estimate from partial budgets and scale up.
8. **Input suppliers:** Seed, fertiliser, nurseries, breeding station owner. Estimate volumes demanded in the market and volumes provided by the average input supplier. Estimate average employment per input supplier and estimate the total number of FTEs this generates.
9. **Service suppliers:** Extension, design, marketing etc. Estimate how much of the services provided by the suppliers feed into the specific chain (and not to other chains).

A fast way to get an idea of the number of actors in a value chain is to carry out interviews with wholesalers. Wholesalers are often located in just a few locations and there is usually a small number of wholesalers compared with the number of farmers, collectors or retailers. Through a combination of census counts (counting the total number of wholesalers in a certain location) and interviews with a number of wholesalers it is possible to get a good estimate of the total traded volume of a product in the value chain (e.g. tons of avocados, or number of roses). Conducting interviews with the other actors in the chain to estimate their typical turnover allows an estimation of how many actors are involved.

As many actors in agricultural value chain are only involved seasonally, it could be useful to convert the collected employment data into a standardised indicator. This allows comparisons among various value chains, for example using the number of FTEs as the main indicator for the employment created by a certain value chain. One just simply defines or agrees on how much labour days per year are considered 1 FTE, for example 240 days. If someone only works for 120 days, this is accounted as a half FTE. It is also important to consider both direct and indirect employment in administration and ancillary services. In another example, farmers can hire labour to work on lower valued crops while they concentrate their own labour on higher valued crops.

Take Note



For a quick insight in the employment generation by a value chain focus resources on the use of participatory analysis tools with wholesalers and transporters. They are often concentrated in just a few locations (saves time in visiting) and have a very good overview of traded volumes and the various upstream and downstream channels.

Due to employment diversification strategies, the employment in one value chain may be only a small fraction of the total employment of a household; especially for service activities all along the chain. The share of employment represented by the value chain should be calculated to accurately model livelihoods and livelihood responses. In the example in Table 40 below, the share of employment in different livelihood activities was calculated for farming households in Laos across different income levels.

Table 40: Average utilisation of labour by livelihood activities in Lao PDR

Farm and Non-farm Activities	Poor	Average	Better-Off
Rice	41.0%	36.3%	35.3%
Root and Tuber Crops (e.g. cassava, potato)	1.7%	0.8%	0.0%
Upland Crops (e.g. maize, other cereals, legumes)	11.2%	9.9%	6.7%
Vegetables	10.7%	9.9%	2.8%
Perennial Crops (e.g. rubber, coffee, pepper)	1.2%	2.6%	1.3%
Annual Industrial Crops (e.g. sugarcane, cotton)	1.0%	1.2%	0.2%
Fruit Trees	2.1%	2.1%	4.9%
Fishing and Aquaculture	0.4%	1.3%	2.2%
Small livestock (e.g. poultry, pigs, goats)	5.4%	10.2%	9.5%
Large Livestock (e.g. cattle, buffalo)	1.8%	3.9%	7.3%
Non-Timber Forest Products	5.0%	1.8%	0.9%
Forest Products	2.6%	2.1%	0.9%
Other Farm Activities	2.7%	0.5%	0.0%
Handicrafts and Weaving	3.0%	1.7%	0.9%
Off-Farm Work and Remittances	10.2%	15.8%	27.2%
Total	100.0%	100.0%	100.0%

Source: (UNDP and NERI 2005)

Step 3 Calculate the employment distribution at different levels of the value chain

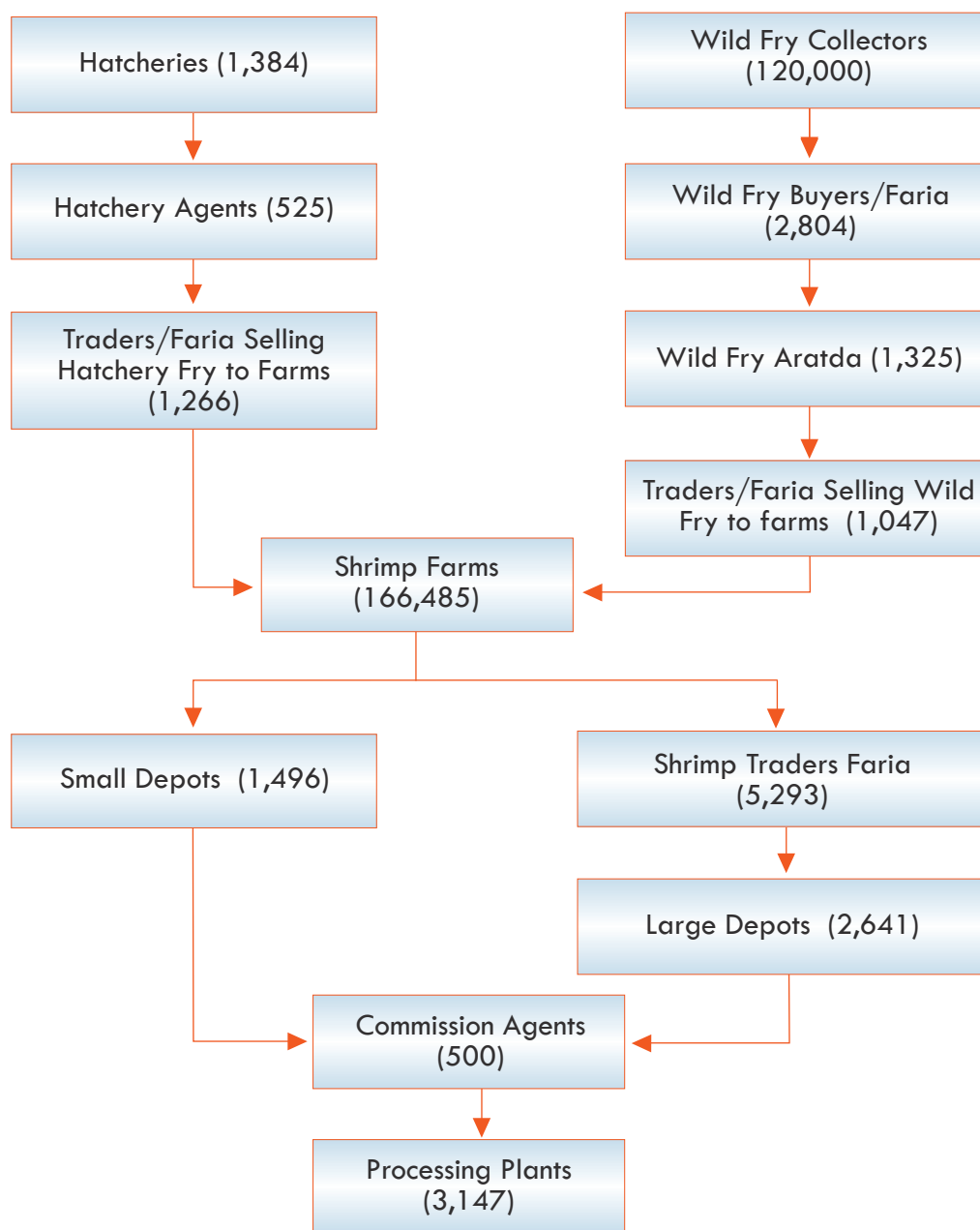
Conduct field surveys to obtain an indication of the different dimensions of employment at each level of the chain according to the category. These surveys can be short and simple, just to get some idea of turnover volumes per actor (e.g. mean harvested number of roses per farmer per year; or average annual traded volume per collector per day/month/season/year), income levels, or the number of hired labourers.

Comparison of employment over different stages in the chain should be undertaken according to the various categories developed in Step 1. This gives a picture of the distribution of benefits to individuals within the framework of enterprises at each level of the value chain.

An example of this is given in Figure 22 below, which shows the different numbers of actors at each level of the shrimp value chain in Bangladesh. This can be extended to describe the different categories of actors (poor, non-poor, self-employed, wage earners).

4

Figure 22: Example of employment over different stages in the value chain



Note: Faria, Aratdar and agents are specific types of middlemen engaged in the shrimp value chain in Bangladesh
 Source: (BCAS 2001)

Take Note



Estimating the levels of employment at each level of the chain is difficult. The information often does not exist and large assumptions need to be made. For example, if total volumes of production are known, and the average production per farmer can be estimated, then employment at the farm level can be calculated. Similarly, average volumes of trade by individual wholesalers can give an estimate of the number of wholesalers in the value chain.

Step 4 Analysis of the employment distribution contribution

Comparing the distribution of employment across each level of the value chain enables a comparison of benefits actors are getting at various levels of the chain. This is complementary to the analysis of the margins and the profits at each level of the value chain. However, an analysis of the employment gives a more accurate picture of the true distribution of benefits at each level of the value chain, as it reflects the often vastly different number of players at each level of the chain. A matrix can be developed that shows the numbers of actors by category at each level of the chain; see the example in Table 41 below.

Table 41: Example of analysing the number of actors at each level of the chain

		Farmer	Collector	Trader	Wholesaler	Input supplier	Service suppliers
Number of People	Poor Average Better-off							
Volume of sales	Poor Average Better-off							
Number of people	Unskilled Low-skilled High-skilled							
.....								

Box 32: Example of employment impact evaluation

Within the framework of the GTZ Value Chain development program in Vietnam an avocado value chain analysis was carried out in Dak Lak Province. As avocado trees are mostly grown as shade trees or windbreakers around coffee fields, the avocado sector in Dak Lak has not been very visible for policy makers. On average a farmer has about five avocado trees, which might suggest that avocado is not an important product in Dak Lak. Based on data collected during a rapid diagnostic appraisal and a short survey among the 98 major avocado wholesalers in Dak Lak province it was possible to calculate the number of persons involved in the avocado sector. This example only makes estimates of the avocado sector in Dak Lak and does not include all the employment involved of wholesalers and retailers in Ho Chi Minh City, Hanoi and all other cities to which the avocados are transported.

Based on the census it was estimated that during the main avocado season, 337 ton of avocados per day are exported from Dak Lak to other provinces in Vietnam. This figure was obtained through very short interviews (max 20 min per wholesaler) with almost all avocado wholesalers in Dak Lak province. These 337 ton per day are only exported during the main season, which lasts four months. Avocado is also traded during the other eight months of the year but in very small volumes. Employment analysis was focused on the main season only, so the data presented below are an underestimation of the employment generated by the sector.

4

Sector size in Dak Lak:

Avocados exported by Dak Lak wholesalers	337 ton/day	40,410 ton/season
Harvested number of trees	3,368 trees/day	404,100 trees/season
Number of farmers involved	674 farmer/day	80,820 farms/season
Number of collectors involved	1648 persons/day	
Harvested area	22 ha	2,649 ha
Truckloads	42 truckloads/day	5,051 truckloads/season

In addition to the 100 avocado wholesalers there are also about 1648 active collectors. These actors play the most critical role in the avocado value chain as they harvest and collect the avocados. They visit the farmers and harvest one or two trees per visit. In total about more than 80,000 farmers are involved, with an estimated harvested area of more than 2,600 ha.

Assumptions for these calculations:

Average harvest per tree	100 kg/tree
Mean no. of trees per farmer	5 trees/farmer
Turnover per collector	200 kg/day
Number of trees per ha	150 trees per ha
Average truck load	8 ton/truck

These data do not include the employment the sector generates for a business service provider like the bamboo basket makers. All avocados are transported in large bamboo baskets, with each basket containing about 100 kg of avocados. This means that every day about 3,368 bamboo baskets are required. As the baskets are recycled and data was not collected about this no estimate was made of the employment generation for bamboo basket makers, but it must be significant.

It was further calculated that the total value added of the avocado sector in Dak Lak province was almost USD 7 million in every main season. With these data and the employment estimates it was possible to create an increased awareness among provincial policymakers about the economic importance of the avocado sector in Dak Lak.

Source: (Wijk 2006)

Comparing employment across value chains is a good indicator of alternative activities which households could undertake. In the example in Table 42 below, the value chains for five different sectors in Zambia are compared for employment and income. The results indicate that the domestic horticulture, cotton and tobacco sectors are the ones with the most employment, and that there are significant opportunities for wage employment in the tobacco and export horticulture chains.

Table 42: Income distribution and employment across value chains in Zambia

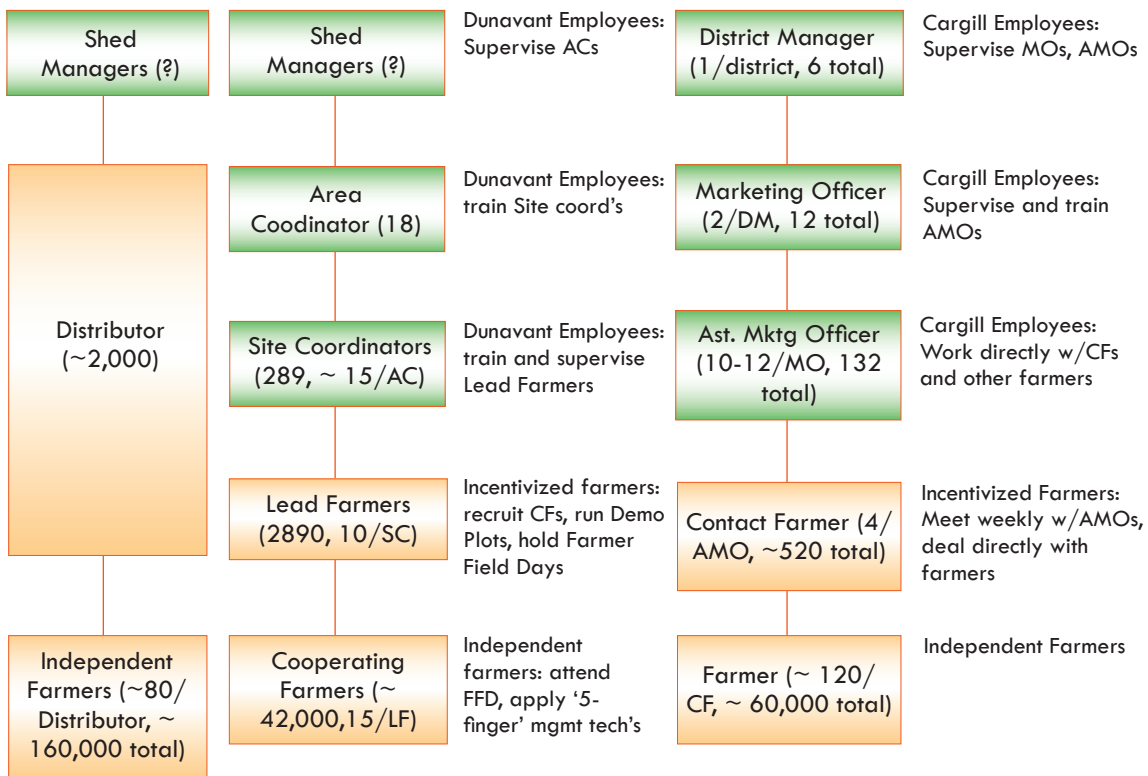
Value Chain	Sector Earnings (USD million)	Wage Employment	Small Farmers	Earnings per Person (USD/day)
Cotton	81	2,300	280,000	1.30
Tobacco	63	92,000	23,000	2.49
Sugarcane	65	4,000	1,692	51.91
Export Horticulture	55	14,500	2,500	14.71
Domestic Horticulture	116	10,000	525,406	0.98

Source: (Purcell, Gent et al. 2008)

Step 5 Determine the impact of Governance on employment

With this step, a researcher can compare employment across sub-chains of the value chain that have different governance structures (e.g. informal linkages versus contract linkages). The analysis in the steps above can be ungrouped by governance structures. In the example in Box 33 below, the value chain for cotton in Zambia is separated into three governance chains, which show the levels of employment at each value chain stage.

Box 33: Example of employment across different governance structures in cotton in Zambia



Source: (ABD 2005)



Step 6 Determine the impact of technology structures on employment

Compare employment across different sub-chains of the value chain that have different technology structures (e.g. supermarket chains versus traditional retailing chains, village rice mills versus commercial rice mills, smallholders versus commercial farms).

For example, the development of a supermarket is expected to decrease employment of the poor, due to the use of capital-intensive versus labour-intensive technology in supermarket distribution. Thus, to achieve poverty alleviation objectives, the diversity of retail distribution, including distribution by small-scale markets, should be maintained as much as possible.

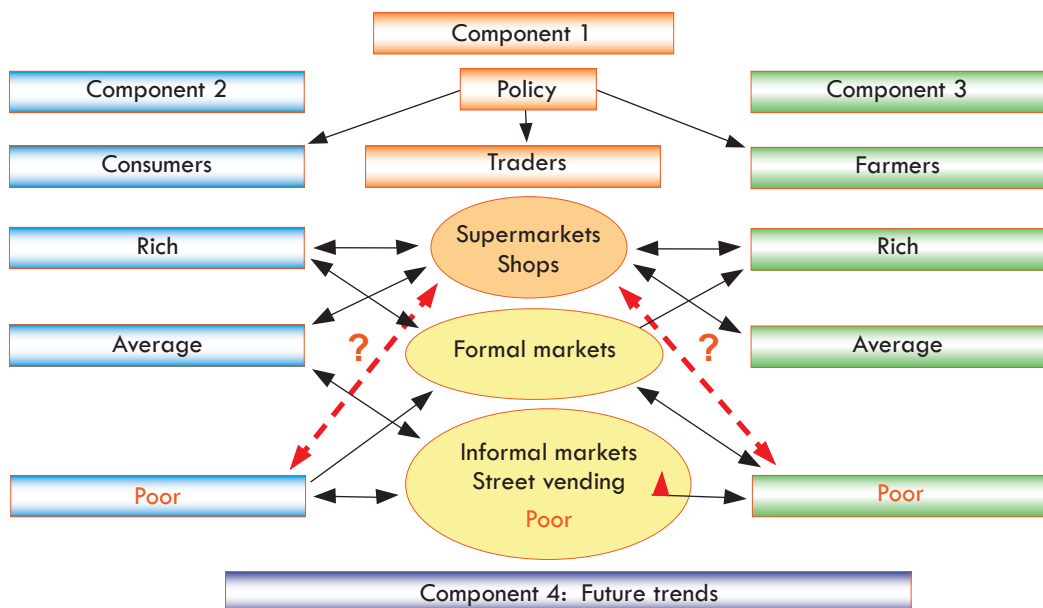
Also, the opportunities for the poor to participate in the supermarket-driven chain as supplier or trader of produce tend to be fewer because of stricter quality and consistency of supply requirements by supermarket chains as compared to less advanced types of retail distribution.

Finally, because of prices tending to be higher in supermarkets as compared to e.g. small scale markets, the poor (as consumers) may suffer if cheaper alternatives are not available.

Box 34: Example of employment generation for poor in a supermarket-driven chain in Vietnam

Summary of investigated issues on the poor's access to supermarkets and other Domestic Value Chains (DVCs) in Vietnam.

The case studies show that poor farmers as producers have no direct access to supermarkets because of the requirements of the latter in terms of safety (for vegetables) and quantities (for all products).



Source: (Moustier, Anh et al. 2006)

Step 7 Determine the employment variability over time

Look at the changes in employment over time, both within the year (seasonality), as well as between years. Timelines of changes in employment across different sub-chains over a longer period (e.g. 5 years) can be very informative and useful.

Table 43: Seasonal labour patterns in Houysan Village, Savannakhet Province, Lao PDR

Activity	Labour		Month											
	Males	Females	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wet Season Rice	50%	50%												
Irrigated Rice	50%	50%												
Vegetables	10%	90%												
Maize	40%	60%												
Sweet Potato	40%	60%												
Tobacco	80%	20%												
Resin	50%	50%												
Bamboo Shoots	20%	80%												
Daily Labour	60%	40%												
Alcohol Making	0%	100%												
Blacksmith	100%	0%												

Source: (UNDP and NERI 2005)

Box 35: Survey questionnaire for calculating distribution of employment

Labour Use Schedule

Get the farmer to list all farm and non-farm activities and sources of income and livelihood. Put them into the categories below. Using 200 seeds, ask the farmer to partition and weight each activity according to total household labour use over the year. For After the farmer has finished weighting review the results with the farmer. Do pair-wise comparisons between the cells, asking the farmer to verify that the relative weightings are correct.

Farm and non-farm activities	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec
Rice	___%	___%	___%	___%	___%	___%
Root and Tuber Crops (cassava, potato etc)	___%	___%	___%	___%	___%	___%
Upland Crops (maize, other cereals, legumes etc)	___%	___%	___%	___%	___%	___%
Vegetables	___%	___%	___%	___%	___%	___%
Perennial Crops (rubber, coffee, pepper etc)	___%	___%	___%	___%	___%	___%
Annual Industrial Crops (sugarcane, cotton, etc)	___%	___%	___%	___%	___%	___%
Fruit Trees	___%	___%	___%	___%	___%	___%
Fishing and Aquaculture	___%	___%	___%	___%	___%	___%
Small livestock (poultry, pigs, goats, etc)	___%	___%	___%	___%	___%	___%
Large Livestock (cattle, buffalo, etc)	___%	___%	___%	___%	___%	___%
Non-Timber Forest Products	___%	___%	___%	___%	___%	___%
Forest Products	___%	___%	___%	___%	___%	___%
Other Farm Activities	___%	___%	___%	___%	___%	___%
Handicrafts and Weaving	___%	___%	___%	___%	___%	___%
Off-Farm Work (Not Including Remittances)	___%	___%	___%	___%	___%	___%
	Check Sum Total					= 100%

Source: (UNDP and NERI 2005)

4

The questionnaire above can be implemented in the field using a large sheet of card paper, which can be laminated to allow repeated use. The respondent can place seeds on each of the boxes to represent their labour use. The example in Figure 23 shown below is an analysis of a farming system in Mindano, Philippines. The picture indicates that the household spends an equal amount of time over the year “saging” their banana trees (weeding and cutting on a regular basis) and taking care of their single cow “Baka”. They have a second field where they plant maize in July-Oct and rotate with sweet potato (“camote”) and squash. Finally, under the banana trees they plant a small bit of taro (“gabi”) which they harvest one year later (hence the activities all occur in the Jan-Feb period).

Figure 23: Example of analysing labour utilization using participatory approaches in the Philippines



The results of individual respondents can be grouped within specific categories (e.g. location, income level) and presented in a tabular format as shown below.

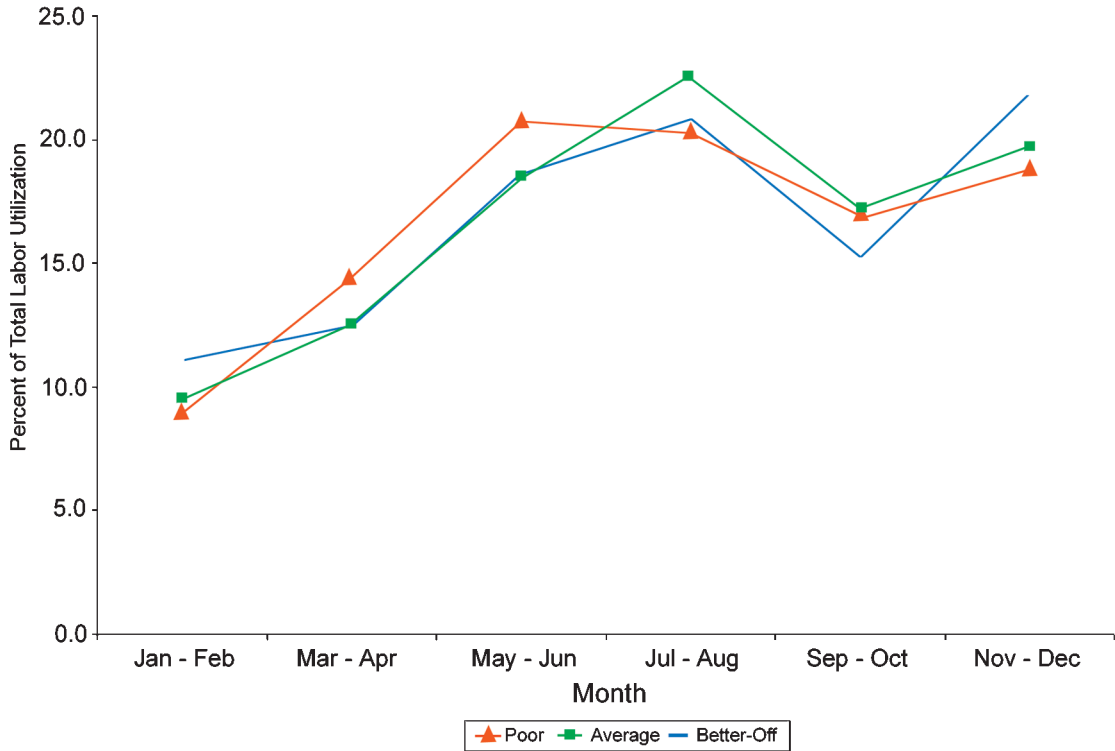
Table 44: Average use of labour (%) by livelihood activities - poor families in Houysan Village, Lao PDR

Farm and Non-farm Activities	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Total
Rice		5.6	7.4	14.6	6.2	12.0	45.8
Root and Tuber Crops (e.g. cassava, potato)							
Upland Crops (e.g. maize, other cereals, legumes)		1.8	2.6	3.4	2.8	2.0	12.6
Vegetables	4.6	3.2	1.2		3.2	3.4	15.6
Perennial Crops (e.g. rubber, coffee, pepper)							
Annual Industrial Crops (e.g. sugarcane, cotton)							
Fruit Trees							
Fishing and Aquaculture							
Small livestock (e.g. poultry, pigs, goats)	0.6	0.6	0.6	0.6	0.6	0.6	3.6
Large Livestock (e.g. cattle, buffalo)							
Non-Timber Forest Products			1.0	6.4	7.0	1.4	15.8
Forest Products	2.0	1.2	1.0	0.8	0.8	0.8	6.6
Other Farm Activities							
Handicrafts and Weaving							
Off-Farm Work and Remittances							
Total	7.2	12.4	13.8	25.8	20.6	20.2	100.0

Source: (UNDP and NERI 2005)

Table 42 above can be used to carry out additional analysis which can be presented in graphical format, such as the distribution of labour over the year (data presented in the final row of the table).

Figure 24: Graphic presentation of grouped labour use



Source: (UNDP and NERI 2005)

Similarly, an analysis can be carried out to show the labour constraints over time, which may indicate when hired labour is used, and what changes to the production system may need to be put in place to alleviate labour shortages. Using the example questionnaire in Box 36 below, a graphical representation of seasonal labour constraints can be constructed.



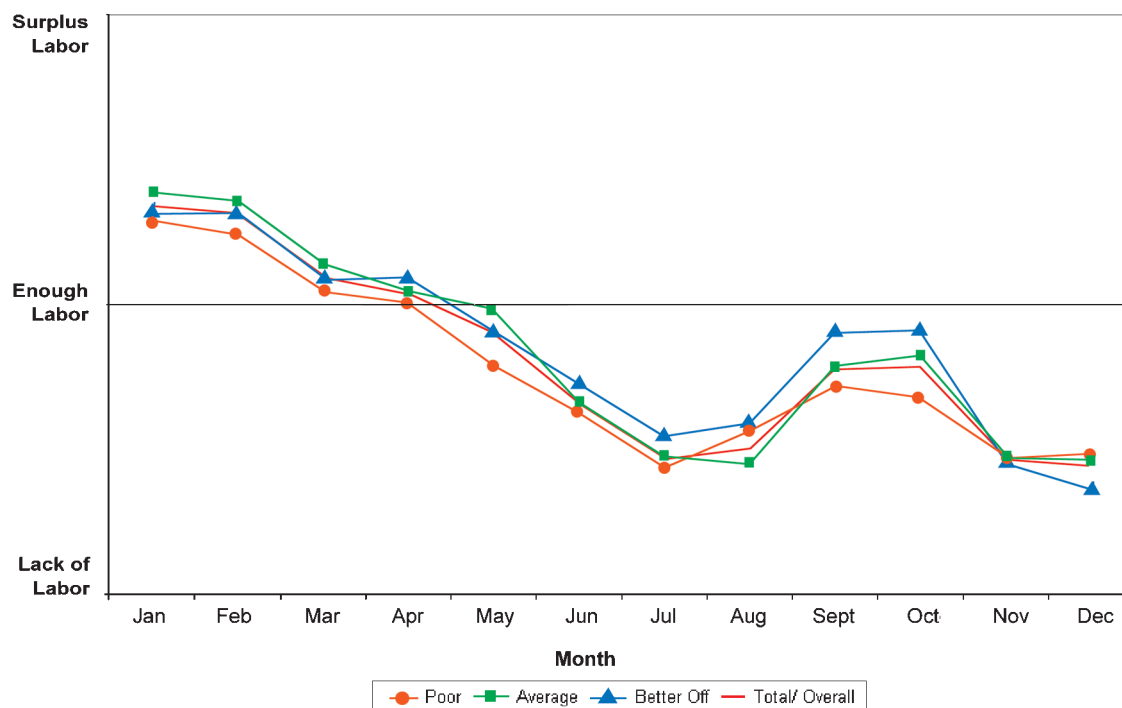
Box 36: Example of survey questionnaire for calculating labour constraints

What are the seasonal labour constraints for the farmers? Get the farmer to place a or a in the appropriate row for each month.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Surplus Labour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enough Labour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Labour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Source: (UNDP and NERI 2005)

Figure 25: Graphic presentation of labour constraints by different household types over the year



Source: (UNDP and NERI 2005)

5. What Should be Known after Analysis is Complete

After having followed all the steps, the key questions outlined below should be able to be answered:

1. What are the differences in employment within and between different levels of the value chain?
2. What are the impacts of the distributional outcomes of the value chain on the poor and other disadvantaged groups, both currently and in the future?
3. What are the changes in employment that result from the development of various types (e.g. vegetable trade through traditional open air markets versus modern supermarkets) of value chains?
4. What is the variability of employment and risks to livelihoods within and between various levels of the value chain?
5. What is the impact of various governance systems on employment distribution between and within various levels of the value chain?
6. What is the impact of various value chain technologies on employment distribution between and within various levels of the value chain?

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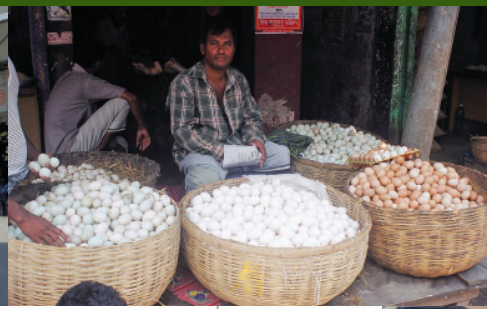
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2008