

Supply chain management and agro-enterprise development: CIAT's approach in S.E. Asia

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Abstract

CIAT's Rural Agroenterprise Development Project has taken a territorial approach to equitable, market-oriented, agriculturally based development in the rural tropics, with the objectives of poverty reduction (through income generation) and environmental sustainability. A four-stage methodology has evolved based on experiences in South America, Africa and, more recently, S.E. Asia. These stages are:

1. Formation of working groups at the level of rural communities, comprising stakeholders interested in equitable, market-oriented agro-enterprise development, and building consensus on a vision for the future;
2. Prioritisation of agri-food sub-sectors for further development, based on integration of market demand, production and environmental criteria, and economic profitability and in line with overall working group objectives;
3. Strengthening of the supply (value) chains associated with each prioritised sub-sector, with active involvement of local community groups, support organisations and supply chain actors from outside the rural area;
4. Development of sustainable services (BDS) to support and further enhance the competitiveness of the supply chains into the future.

Examples of this approach from South America and Vietnam – root crop starch sub-sector - are presented, along with details of a new SDC-funded *Small-scale Agroenterprise Development in the Uplands* (SADU) project in Vietnam and Laos, which aims to adapt the process to the situation of these two S.E. Asian countries.

Introduction

Globalisation, trade and public sector reforms, urbanisation and technological advances are all contributing to an agricultural sector in rapid change across the developing world. Rural smallholders, who must be reached if the millennium goal of reducing poverty rates by 50% by 2015 is to be met, face declining real prices for their basic commodities. Competitive pressures, often from imported foodstuffs, are driving a process of intensification in the use of natural resources. This has potentially serious consequences for sustainability in the longer term.

Markets are penetrating deep into what were formerly rural subsistence economies. To survive, producers now need to operate successfully in a different, market-oriented environment where new skills and knowledge are needed to make different types of decisions. At the same time, the agri-food industry is itself changing, with a rapidly

increasing role for managed, coordinated supply chains that are dominated by a few large – often multinational – supermarket retailers.

This trend of increasing concentration and vertical coordination in agri-food supply chains tends to marginalize smaller scale producers. In turn, rural producers are seeking options that will provide opportunities for them to improve their livelihoods and incomes. These can include production of higher value crops (rather than basic commodity staples), differentiation and added value through production practices (e.g. organics), product quality, packaging and marketing strategies (e.g. fair trade). Options also include leaving agriculture to seek off-farm income, either in the local rural area or via migration to urban centres.

To achieve success with the demand side options, smallholder producers need to participate in supply chains for added value products with growing markets. This means finding ways to participate in the type of managed supply chains that are now developing, in a manner that is both efficient (i.e. competitive), but that is also compatible with environmental and social sustainability. This implies a need to combine a supply chain approach with local development processes in specific communities (a territorial approach). This paper presents an approach by CIAT's Rural Agroenterprise Development Project to meet this challenge.

The Rural Agroenterprise Development Project at CIAT¹

Based in Cali, Colombia, the project started in 1996 as an outgrowth of previous work on post-harvest technology, marketing and enterprise development of cassava. The purpose of the project is to link smallholders with growth markets and motivate the adoption of natural resource conservation practices through the development of techniques and information for the establishment and strengthening of rural agroenterprises and their complementary support services. In particular, the project focuses on strengthening local capacities for rural business development through information, methods and institutional schemes, all in collaboration with local partners.

Basic values of the project include: (a) an entrepreneurial, market oriented focus, (b) participatory decision-making with partners, (c) focus on strengthening existing local skills and building new ones, (d) search for consensus among actors, (e) equal access to opportunities for participating groups, and; (f) social, economic and environmental sustainability.

The territorial focus has been developed in three specific field sites in Latin America: Pucallpa, Peru; Cauca, Colombia; and Yorito, Honduras. In each of these sites, CIAT has worked with a variety of local partners including producer groups, NGOs, governmental organizations, private sector and others. It is out of this fieldwork and dialogue with partners that the approach has evolved.

Prior to explaining the approach in detail, it is important to explain why CIAT has chosen to combine a territorial approach with the development of supply chains for specific, prioritized commodities or products. By focusing on a given geographical area or territory, it is hoped that a local skills base may be built that not only generates positive returns for a specific sub sector or supply chain but also produces spill over effects

¹ This section draws on the paper prepared by the CIAT project staff in Latin America (Lundy, Ostertag and Best, 2002)

which contribute to a diverse and dynamic local economy. Market systems will change, so by not limiting work to a specific product, a territorial approach allows flexibility and adaptive learning which the working groups can continue to apply as the market opportunities change. For agricultural products, a focus on the land where they are produced also helps the development of more sustainable and diverse production systems, whereas a single supply chain focus could tend to the opposite. In addition, the selection of a number of options for a given territory makes it possible to target different socioeconomic groups or agro ecological niches, providing for more balanced social and agricultural development. Finally the creation of human capital and the improvement of both bonding and bridging social capital among organizations are embedded in this approach. This last point is important for achieving sustainable gains against poverty in a region.

The territorial approach consists of four major areas of work:

1. The identification of a specific working group composed of diverse local organizations with interest in rural business development.
2. Identification of supply chain priorities based on market opportunities available to the region.
3. Participatory supply chain analysis and development, through consensus building with chain actors.
4. Provision of appropriate and sustainable business development services for the region.

The entry point for this approach is the identification and consolidation of a local working group in a particular community or territory. The other areas of work are then subsequently developed in collaboration with that group.

Local working group formation

The formation of a working group around the theme of rural business development is an iterative process that varies depending on the organizations present in the area, previous experiences and the necessities of the local population. In our experience, these groups usually include strong representation from producer organizations and NGOs with somewhat lesser participation by public and private sector actors. Membership in the interest group and the organizational form are decided by the participants, as is the demarcation of the territory in which the interest group seeks to work. To facilitate these decisions, two specific activities are carried out with the interest group at the beginning of the process. First, a profile of the territory including biophysical, social, organizational, institutional, economic and political concerns is developed with secondary data and the use of rapid rural appraisal tools. This information provides a common basis for decision-making among group members. Based on this information, a consensus for action is developed that builds on agreements around a common vision, mission and values, and the organizational structure and rules for working group operation. An initial action plan is then developed. At this stage, topics like market orientation, entrepreneurship, participation and alliances are debated. This process is key since it allows group members to discuss and analyze past experiences and decide on what actions are appropriate in the future.

Identification and management of market opportunities

Once the working group exists, one of the first questions is what products and/or areas are most likely to generate positive impact for the region. To avoid past mistakes where

increased production of a single or restricted range of crops/products led to saturated markets, low prices and continuance of the poverty cycle, a market orientation is fostered by involving the local actors directly in the identification of market opportunities. This process consists of two types of work: specific market studies and the on-going management of market intelligence. In the first area, CIAT has developed a market opportunities identification manual (Ostertag,1999) which seeks to respond to three main questions:

- (a) what products show strong market demand in terms of increasing volumes and prices;
- (b) which of these products can be produced in the region given the biophysical characteristics, infrastructure and access to productive resources; and,
- (c) of those products identified in (a) and (b), which are of interest to smallholders.

This opportunity identification process involves the collection of information from different market outlets, including produce markets, local shops and supermarkets, food processors and traders in order to assess the prospects and potential for developing produce and product supply options. These market outlets can be local to the territory or beyond, in urban centers, or in some cases in neighboring countries. Opportunities for export can also be considered.

The end result is a portfolio of options. The size and diversity of this portfolio depends on market conditions, biophysical characteristics and potential of the territory to produce any given alternative, profitability and on farmer interest, but normally includes from ten to thirty possibilities. Sustainable production criteria – soil conservation, biodiversity etc – can be included in the evaluation and prioritization process.

In the area of market intelligence, we seek to build local capacity to generate, manage and disseminate key market information on a permanent basis. This capacity involves not only direct market visits by working group members and/or interested groups of farmers, but also strategic alliances with national market information system programs and the development of information dissemination tools appropriate to the rural context and local culture.

The end result of a market opportunity identification study is a basket of possible options for development in the selected region. At this stage, the working group prioritizes these options based on local criteria in a participatory fashion. Local criteria used have included strength of market demand, product profitability, environmental impact, perceived ex ante development impact, organizations interested in the product among others. These criteria vary by region and culture. Using local criteria the market options are ranked and a decision made on which option(s) to pursue first.

Integrated Supply Chain Projects

At this stage the local working group moves into the participatory analysis of the selected product supply chain. CIAT has developed a method that seeks to facilitate the analysis of the market chain by the actors directly involved and, through this process to generate collectively owned information and a consensus for action. The scope of this analysis is somewhat broader than a typical sub sector approach in that includes not only the supply chain as such (production, post-harvest/processing and marketing) but also two important cross-cutting areas: business organization and the provision of business development services (see Figure 1).

Business (enterprise) organization and support services present in a supply chain are key to understanding the prospects for improving chain performance through the effective use of existing skills and services, as well as identifying important bottlenecks that constrain such improvements.

Once priority supply chains have been agreed, specific market contacts are identified. This is complemented by a broader identification of relevant actors (those involved in production, post-harvest and marketing operations) who can participate in the analysis of the chain. Participatory tools, focus groups and direct interviews with the different actors are used to collect supply chain information (chain mapping). It helps to group actors so that the perceptions of traders, producers etc can emerge independently, for later comparison and analysis in a wider group setting. All actors then review this information to identify and analyze bottlenecks and propose solutions. At the end of the process, facilitated consensus-building workshops are held where all information is shared and discussed with the various actors with the goal of identifying positive synergies among actors, common interests and critical points where strategic investments can achieve high returns. Figure 2 shows the steps used in this analysis

After the process of negotiation with actors occurs, an action plan, or Integrated Agroenterprise Project (IAP), is drafted which includes both research and development activities in the short, medium and long term. The goal of this project is to improve the competitiveness and sustainability of the chain through the development of a common business development vision among various actors. Once a common vision has been established, specific development or research activities may be disaggregated into discrete projects depending on funding opportunities and donor interest while conserving a clear idea of where everything fits together.

The implementation of activities is coordinated by the working group, which sources appropriate funds and technical services based on the demands identified during this process. By learning how to do design and implement an IAP – diagnose, analyze, design, source funds and coordinate implementation activities – the local working group builds important capacities, which are needed for other future projects.

Provision of appropriate and sustainable Business Development Services (BDS)
A final component in the CIAT approach is the provision of appropriate and sustainable Business Development Services that support the participation of rural communities in these more efficient supply chains. A methodology is now under development at CIAT for assessing the supply and demand for services in local communities, and for ensuring that gaps in the market for services are filled in a sustainable manner. This covers financial, non-financial, formal and informal services and seeks to build functional markets for BDS that link specific demands with suppliers either at the local, regional or national level. This is currently under development in an NZAID-supported project in Honduras and Colombia.

These methods have been developed through participation in local and supply chain development projects in Latin America – see Lundy et al (2002) for more information on the results obtained in Peru, Colombia and Central America to date.

CIAT project activities in Asia

Between 1998 and 2002, CIAT's Agroenterprise Project has had two areas of activity in Asia, one focused on the root crop starch sub-sector in Vietnam - especially the small-scale processing enterprises around Hanoi – and the other concerned with developing a strategic alliance with SEARCA-AIDP and UPWARD for capacity building in the Agroenterprise Development area. During 2003, a major SDC-funded Agroenterprise development project for Lao PDR and Vietnam has been initiated, representing an opportunity to adapt the methodologies developed in Latin America (and now also being trialed in Africa) to the Asian regional situation.

Rural agroenterprise development training courses with SEARCA and UPWARD

Two regional courses have been conducted, one in SEARCA-Los Banos, Philippines, in 2001, and a second in PHTI-HCMC, Vietnam in April 2003. The course stressed markets and supply chain development in the context of territorial (micro-regional) processes and priorities. Each course has comprised modules on

- Asian context – macro policies and trends in rural development and the agri-food sector
- Local participation
- Methods for designing and implementing rural agroenterprise projects
- Learning from experiences
- Project design, including fieldwork

Participants in the first course (13 from 3 countries) were mainly from academic or research institutions, while those in the second course (25 from 4 countries) were principally from rural development agencies in both the NGO and public sectors (provincial level). Course evaluations have proved very positive, and a further SE Asian regional course is planned for 2004, perhaps in Indonesia. PHTI-Vietnam is planning to adapt course materials for a Vietnamese national course, also in 2004. A loose network of course participants exists, and the new CIAT project in Vietnam will serve to strengthen this further, especially in Vietnam and Laos.

Vietnam starch cluster project (SIUPA)

A national study of small-scale root crop starch industry in 1998 (Goletti et al, 2001) identified the potential of rural industrialisation to generate income and reduce poverty. Since then, and more detailed study has been undertaken of the cluster of root crop processing enterprises in Dong Lieu commune, some 20km from Hanoi. This has since developed into a more development-oriented project to improve the performance of the supply chain (or system of enterprises), supported by Urban Harvest (formerly SIUPA), the Strategic Initiative on Peri-Urban and Urban Agriculture of the CGIAR).

The area is traditionally agricultural but has, since the late 1960's, specialized in household-level root crop – cassava and canna – processing, due to its proximity to Hanoi and access to its growing markets. Since then, processing capacity has increased 3-10 times, an average of 600% increase over 15-25 years. The average amount of cassava processed has increased from 0.05 t/hh/day in 1978 to 3 t/hh/day in 2001, while the average amount of canna processed has increased from 0.04 t/hh/day in the 1960's to 9 t/hh/day. Thus, the volume of roots handled by each trader has increased by 200-300% over recent time. Of the 2,193 households in the commune, 1,410 households (64%) are directly involved in root crop processing, while others supply raw materials, trade end products, use processing by-products, or provide a wide range of support services. On average, pig raising using the residue from cassava processing as a major feed ingredient is a common supplemental livelihood activity in

root crop processing households (1,409, or 64% of households raise pigs). Only 4% of households obtain a livelihood mainly from crop production. In the 2000/1 processing season (approximately September to April) the commune processed 680 t of cassava roots and 314 t of canna roots daily.

As the starch processing developed, a starch-based cluster of enterprises emerged in support or in association with starch processing (Table 1). The ever-increasing enterprises are packed in the small village area with little space to operate and no space to expand. The major constraints facing the starch processors are not the technologies, as they are developed appropriately, but the limited space and the associated constraints to production.

Consequently, the women often queue for hours (some claim 3-4 hours) to obtain roots before pushing/pulling the heavy cart load back home, which for some can be a fairly long journey depending on location. Thus, much time and labour is wasted on root procurement. Moreover, due to limited space for drying, many processors push cartloads of starch products to the fields and spread them out to dry in the morning and collect them in the afternoon. Again, depending on the location of the house in relation to the field, this can also be a time-consuming activity. The limited space also contributes to low starch quality, as there is not enough space to set up various settling tanks to produce high quality starch. The starch quality is further adversely affected by drying on the very dusty or muddy roadside. Thus, the limited space has resulted in serious wasted labour and low starch quality.

In addition to the adverse effects it has on production, the confined space has caused another serious environmental pollution as starch processing generates a large amount of wastewater and solid matter. Duong Lieu generated almost 1.45 million m³ of wastewater during the processing season of 1999-2000, and estimated 51,750 t of solid wastes.

During a stakeholders' meeting with the commune leaders and processors, limited space, wasted labour, and environmental pollution were clearly recognized by the participants as the major constraints to their enterprise development. During the meeting, no proposals emerged for viable solutions. The constraints were evident, but solutions were elusive.

Subsequently, a trip to Dong Nai Province in southern Vietnam to visit some medium-size processors was organized for Duong Lieu to help generate relevant ideas for overcoming the constraints. The visiting team (comprising processors, an equipment maker and a local government representative) was most impressed with the continuous filtering tank system, which accounted for the high quality of the starch, and the way the wastes were processed or disposed. Based on this observation, the commune brainstormed the idea of designing a processing zone in Duong Lieu that creates a space to accommodate the continuous filtering tank system and a better organized processing layout. The solution came from the commune itself when they observed another production system and compared it with the constraints they face. Concrete steps to implementing the solution may be learned in another visit to a processing zone of the similar nature, planned for late 2003.

Small-scale Agroenterprise Development in the Uplands of Lao PDR and Vietnam

There are continuing high levels of poverty (40-50%) in the upland areas of both Lao PDR and Vietnam. While poverty alleviation is a major aim of rural development programs, market limitations remain a major impediment to success in development. Agroenterprise development can contribute to poverty alleviation through creating more diverse income sources by providing improved access to markets, improving product quality, adding value to raw products through intermediate processing, and in providing service industries. The *Small-scale Agroenterprise Development in the Uplands* project proposes to develop approaches to agroenterprise development at the district and community levels that are appropriate to the economic, cultural and political setting in Lao PDR and Vietnam. The goal is “to develop sustainable agroenterprise initiatives with upland rural communities that generate income and employment opportunities through diversifying and adding value to local natural resources”.

In Lao PDR the project is initiating work in the poorest districts of the relatively isolated Xieng Khouang province. Contacts with the local provincial government have confirmed that community development should be a major concern of the project, in addition to the development specific supply chains based on identified market opportunities.

The province is changing rapidly – new roads to both Vientiane and to the Vietnamese frontier are now open, electricity in urban centers is now much more reliable (power cuts were common) and flights have been increased to bring greater numbers of international tourists to the area.

Although the project is still in the initial phase of working group formation, some market opportunities are already appearing, based on the improved market access that recent infrastructure developments have brought. These include potential in local and national markets to obtain higher prices for new varieties of fruit (plums, nectarines) and prospects for higher prices for local asparagus if selection and packaging can be improved. In international markets, the region is already exporting a specialty rice (glutinous rice) to Vietnam, and a local mushroom is being air freighted via Taiwan to Japanese supermarkets. These and other options will be used as a basis for participatory market opportunity identification as the project progresses.

Understanding the potential role of private enterprises in the economic development of the country, the Vietnamese government has recently introduced many policies with regard to small enterprises establishment, operations, and tax burdens to favour the development of small and medium enterprises, in both agricultural and non-agricultural sectors. Thus, the current environment is very favourable for the project to introduce, test, and adapt the CIAT's experience and approach in agroenterprise development to Vietnam.

The CIAT approach will eventually be tested in the upland districts of three provinces in Vietnam—Tuyen Quang, Thue Thien Hue, and Dak Lak. As in Laos, the project is still in its initial stages. Previous experiences of working in these areas have helped identify some opportunities among the current products and potential projects. In Yen Son District of Tuyen Quang there is opportunity to improve the tea, coffee, various fruit trees, and livestock production such as pig, fish, and meat cattle. The exploited markets for Tuyen Quang include NTFP products, which are yet to be identified, private nurseries, or perhaps organic tea and gourmet coffee. Nam Dong District of Thue Thien

Hue currently produces NTFPs (rattan, bamboo) fruit trees, pepper, fish, rubber, but pigs and chickens, vegetables also have potential to contribute income if properly developed. *Coffee*, NTFP (rattan, bamboo, medicinal plants), timber, maize, rice, pepper in Dak R'Lap District of Dak Lak can be improved to increase their market opportunity while fruit trees and livestock also should not be overlooked as potential enterprises.

The complete supply chain of current enterprises will be evaluated from production to market to examine breakdown or bottleneck in the chain that causes low profitability of the enterprise. Once the bottleneck has been identified, strategies can be developed to modify or eliminate it, or to enhance performance so that obstacles can be removed. For example, if product quality is identified as a major constraint, further investigation into all areas of the crop—variety, agronomic practice, field management, harvesting and handling, and storage—will be necessary to understand the root of the problem. Once that is understood, uncomplicated and short-term on-farm or farmer participatory trials can be conducted to seek solutions. If transportation or volume of produce to meet purchaser requirements are identified as a major constraint, investigation into group marketing, various transportation pros and cons, alternative means to transport, and negotiate with buyers on sharing the burden will need to be considered. Each step on the supply chain will have several aspects that can be considered for improving the function of the whole chain. Through this process the working groups will learn to analyse the weaknesses of the supply chain and ways to find solutions overcome them. This skill, once learned, can be applied to analyse the supply chain of each of the income-generating activities.

Going beyond the current products to explore uncharted markets involves risk, time, and possible cash investment. For cash-strapped and risk-adverse farmers such an endeavour must proceed with caution and comprehensive understanding of market demand and requirements. Both the supply and demand sides must be considered. For example, in order to consider gourmet coffee or organic tea as potential enterprises for Yen Son District of Tuyen Quang Province, the working group must have the knowledge of markets—where is the market and how to connect to it directly or indirectly, quality requirements, quantity required, frequency of delivery, price stability, as well as production knowledge in order to meet the quality, quantity, and seasonal demand with a profit, while withstanding the occasional risk caused by market fluctuation. Such endeavours take time to develop, but the potential benefits of developing new agroenterprises to meet new market challenge could be enormous and should not be overlooked.

The strategy of the project is to focus on the improvement of the supply chain of current enterprises that show strong demand growth for the short run while beginning to assess new market opportunities and assist the working groups in developing the supply chain to meet the market demand in the long run. An important output of the project is that the working group will learn to assess the weaknesses and find solutions for the current supply chains, and assess the potential and find entryways into the potential supply chains. The principles of assessing the supply chains are the same, but the different starting points require different methods in these assessments.

The agri-food sector is changing fast in Asia. Managed supply chains are expanding, and will soon take a major share of processed food and fresh produce markets in many countries in the region. Can smallholder producers bridge the gap that currently exists

between the traditional and the more coordinated, efficient supply chains? Can they participate equitably in such chains?

CIAT believes that opportunities for this do exist, but that success requires a pro-active R&D effort that links supply chain and local development processes, combined with conducive local and national policies that support entrepreneurial endeavors in rural areas. CIAT's Rural Agroenterprise Development Project, with our national and regional partners, is a contribution to this end.

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Figure 1. Scope of Supply Chain analysis

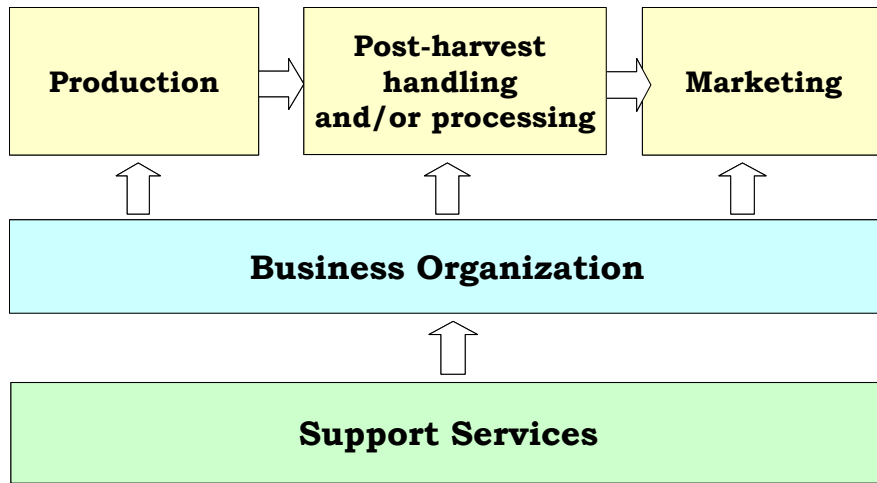


Figure 2. Steps in the Supply Chain Analysis method

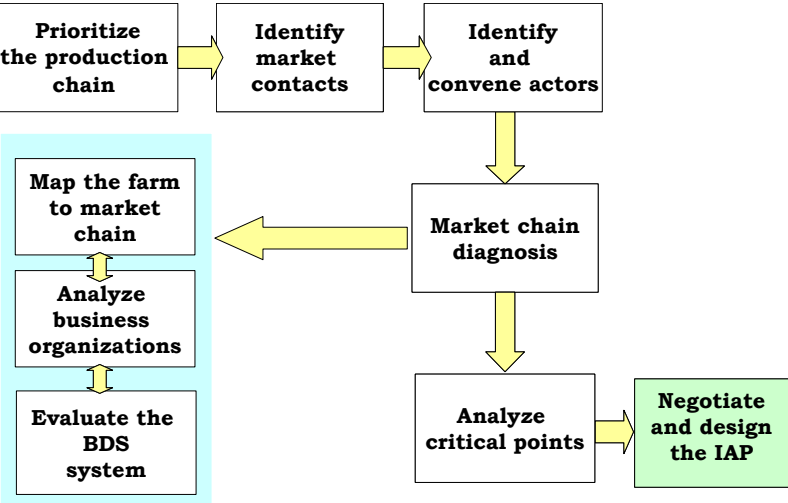


Table 1. Frequency of different household enterprises in Dong Lieu

Household Activity	No. HH	Household Activity	No. HH
Cassava starch processing	630	Processing solid waste trade	11
Canna starch processing	141	Cassava/canna root trade	33
Cassava starch filtering	311	Rice production for maltose	3
Cassava root grating (service)	59	Agricultural labour for hire	201
Canna waste drying for sale	209	Industrial labour for hire	91
Canna waste filtering	32	Green bean processing	15
Maltose production	146	Mushroom production	12
Canna noodle production	65	Pig raising	1409
Sugar processing	2	Alcohol production	21
Rice noodle production	86	Tile cutting	2
Candy production	32	Drying cassava waste (fuel)	432
Tofu production	8	Others (including services)	847
Total no. of activities	4798	Total no. of households	2193