2. CLUSTER DEVELOPMENT STRATEGY

The aim of the cluster development strategy is to strengthen competitiveness of products by enhancing productivity of related companies and organizations located in a specific region (and defined as clusters in this study). In this chapter, we consider strengthening the competitiveness of six high priority clusters. Section 2.1, discusses the selection method. Thereafter, we identify the bottlenecks of each cluster for strengthening competitiveness, and the necessary development strategies.

2.1 SELECTION OF CLUSTERS

There are three considerations in selecting clusters: whether the product is producible, exportable and if it is possible to raise its value-added. In other words, is there any production potential in the country? Is it easy to heighten export competitiveness? Is it able to create value-added? In addition, conditions unique to Paraguay were considered, such as the preponderance of small farmers. We also considered nurturing clusters that support agro-industry related clusters. In 2.1.1, we analyze clusters according to the potential of agricultural raw material production. Based on these results, the discussion in 2.1.2, covers agricultural processed goods production. In 2.1.3, we study the potential of clusters that support agro-industry. In 2.1.4, we examine potential in terms of export competitiveness and value-added.

2.1.1 Selection of raw materials

The mixed feed cluster, vegetable cluster, fruit cluster, cotton cluster, wood cluster and metalworking clusters have been selected as strategic clusters. Procuring a stable supply of raw materials is a key condition to effective clusters. The following two major points were considered in the selection of clusters regarding raw materials.

- Areas that are known domestically for production achievements, utilize a certain level of cultivation technology, and have the potential to increase production volume quickly following assistance in cultivation technology and extension activities
- Areas that can be coordinated with the MAG's agricultural plan, "Construyendo el Futuro Agrario del Paraguay, to strengthen certain targeted crops.

The following ten items were chosen as raw materials for each of the clusters among the major 32 agricultural products selected during the Phase 1 study based on the selection criteria listed above.

Table 1 Raw Materials Selected for Each of the Clusters

Plants	Raw materials
1.Cereals/oil stuff	Soybeans, rice, wheat, corn, green beans, sorghum
2.Roots and tubers	Cassava, sweet potato, carrot
3.Fiber	Cotton, kenaf
4.Fruits	Orange, grapefruit, lemon, mandarin, mango, peach, pineapple, mango, banana, strawberry, watermelon, grape, melon
5.Vegetables	Onion, garlic, cauliflower, pumpkin, cabbage, lettuce, calabash, tomato, pepper, eggplant, cucumber, parsley, sweet corn
6.Beans	green pea, small potato, habilla
7.Flower/ornament plants	rose, carnation, chrysanthemum, gladiolus, orchid, bracken
8.Aromatic plants and herb	Marjoram, pepper, parsley, laurel of Spain, cumin, anis,fennel, saffron, cedar, poleo-I, rosemary, chamomile, ruda, mint, cangorosa
9.Wood	eucalyptus, giants paraiso, araucania, pine tree, quebracho, cedro, yvyrari, guatambu, ybyra pyta, laurel, lapacho
10.Livestock	cattle (cow, beef cattle), pig, chicken, sheep, horse, bee, duck

2.1.2 Selection of clusters from the viewpoint of agricultural processing and production potential

At first, we take up 5 cluster candidates mentioned in 2.1.1 and discuss whether they have processing production potential. We also examine production potential of clusters (agricultural machines, metalworking for food processing machines), which support the development of agro-industry related clusters that demand agricultural products as raw materials.

Production potential consists of three components: appropriate technology, facilities and experience. In this context, technology is not limited to the technology of producing, but includes production technology that can be competitive in terms of quality and cost. It applies to facilities. Experience here means that they have production expertise including the production of similar products. However, they do not necessarily possess all three components. In some cases, it would be acceptable if they have the potential to introduce and absorb these components.

Since manufacturing data is limited, it is difficult to judge these production components quantitatively. Therefore, we attempted to determine Paraguayan production potential based on information obtained through interviews with companies as well as source materials, such as the Central Bank's industrial statistics, the Industrial census and export records. The results are outlined as follows.

The production potential of mixed feed, meat and dairy products is not big in scale since they have been domestic demand oriented. However, some companies have reached the level that can be internationally competitive in terms of quality. Since many companies have a relatively high management level, they can afford to reinforce facilities if export markets were opened.

Production potential of vegetable processing such as canned vegetables and frozen vegetables does not exist at the moment. However, it is possible to introduce them with relatively low investment and without high technology. We also considered their raw materials suitable for small farmers and local job opportunities as processing work, and we determined to take up it as the vegetable cluster.

As take juice and canned fruits as processed fruit goods. Juice can be a main processed orange or melon product, as mentioned in 2.1.1. Since there are few juice companies that have export competitiveness and high management level, we judged that there is production potential in Paraguay.

The scale of cotton processing has fallen from the past, but it is judged to have enough production potential based on past export records. We take up only primarily processed goods (cotton thread and cotton cloth) and exclude secondarily processed goods (cotton clothes and so on).

Wood processing is regarded to have enough production potential, like cotton processing.
However, the technology and production capacities that are necessary to heighten value added are not high enough.

These five clusters belong to the agro-industry. It is relatively easy to take advantage of Paraguayan predominance in this cluster. In comparison with similar countries that have achieved agro-industry based economic development, it is expected to take 5 to 10 years to make significant gains in competitiveness.

2.1.3 Selection of clusters as supporting industries

Paraguay recently enacted a Maquiladora Law. Under the law, industries such as electric product assembly, automotive component processing and sewing are seeking entry. These industries intend to get raw materials and partially processed goods in the MERCOSUR, and other, countries, and process them in a Maquiladora for exporting. However, enforcement rules and neighboring countries' recognition are not clear as of May in 2000. We cannot predict their future developments. When foreign capitals seek entry prompted by the Maquiladora Law or the Investment Promotion Law, they are likely to intend procuring primary raw materials locally due to relatively high land freight in Paraguay. If supporting industries are nurtured enough to meet their demands, it would be easier to promote foreign direct investment (FDI). Among supporting industries, metalworking industries would support assembly industries funded by foreign capitals by components processing and so on.

At the moment, there is high need for repair of agricultural machines, agricultural processing machines and automobiles. Many companies and individuals use machines for a long time or buy used machines.

Service parts and service are required for repair. Paraguay cannot meet the demand domestically.

  With these factors taken into account, we selected metalworking as the sixth cluster. The current state of this cluster is as follows.

- With regard to metalworking, they have high welding technique and accumulated technologies developed through construction of the Itaipu Dam. As for assembly of agricultural machines, whose unit prices are low, their technology level is by no means inferior to that of Brazil. We judge that they have production potential.

2.1.4 Selection in terms of export competitiveness and value added creativity

  Export competitiveness is determined by the extent of potential in terms of competitiveness factors represented by quality competitiveness and price competitiveness in an assumed target market. Since it is impossible to show potential competitiveness by figures, we factored in raw materials cost, processing fees, production technologies, which were collected through interviews with companies, and opinions of each cluster's workshop participants. The results are summarized in table 2. Quality and prices are important competitive factors.   Besides them, differentiation of product standards is influential. Soybean that is not genetically modified and organic vegetation are among them.

Table 2 Export Competitiveness of Each Cluster

high   rather high   ordinary

Cluster	Target Market	Quality Competitiveness	Price Competitiveness
Mixed Feed Cluster	Among MERCOSUR countries, Brazil, Chile and Bolivia are promising. Other Latin American countries, EU and Russia can be target markets.		
Vegetable Cluster	In the short term, exports to Northern Argentina are competitive due to low physical distribution cost. In the long term, EU and the North America are promising with some of product items.		
Fruits Cluster	In the short term, EU is promising. In the long term, Asia an d the west coast of the North America are promising with improvement of access to the Pacific as the prerequisite.		
Cotton Cluster	Argentina and Brazil are promising for cotton thread and cotton cloth. The USA is promising for cotton pants.		
Wood Cluster	Argentina and Brazil are promising as the sawn wood market. In the medium and long term, the USA and Argentina are promising as furniture markets.		
Metalworking Cluster	Domestic market is the target for the time being. In the medium and long term, Brazil is promising for parts production, small machines and metal products		

Export competitiveness must be achieved before creating value added. Even if value added can be obtained domestically, it is useless without sales. The above-mentioned six clusters basically use Paraguayan raw materials and add value on them.