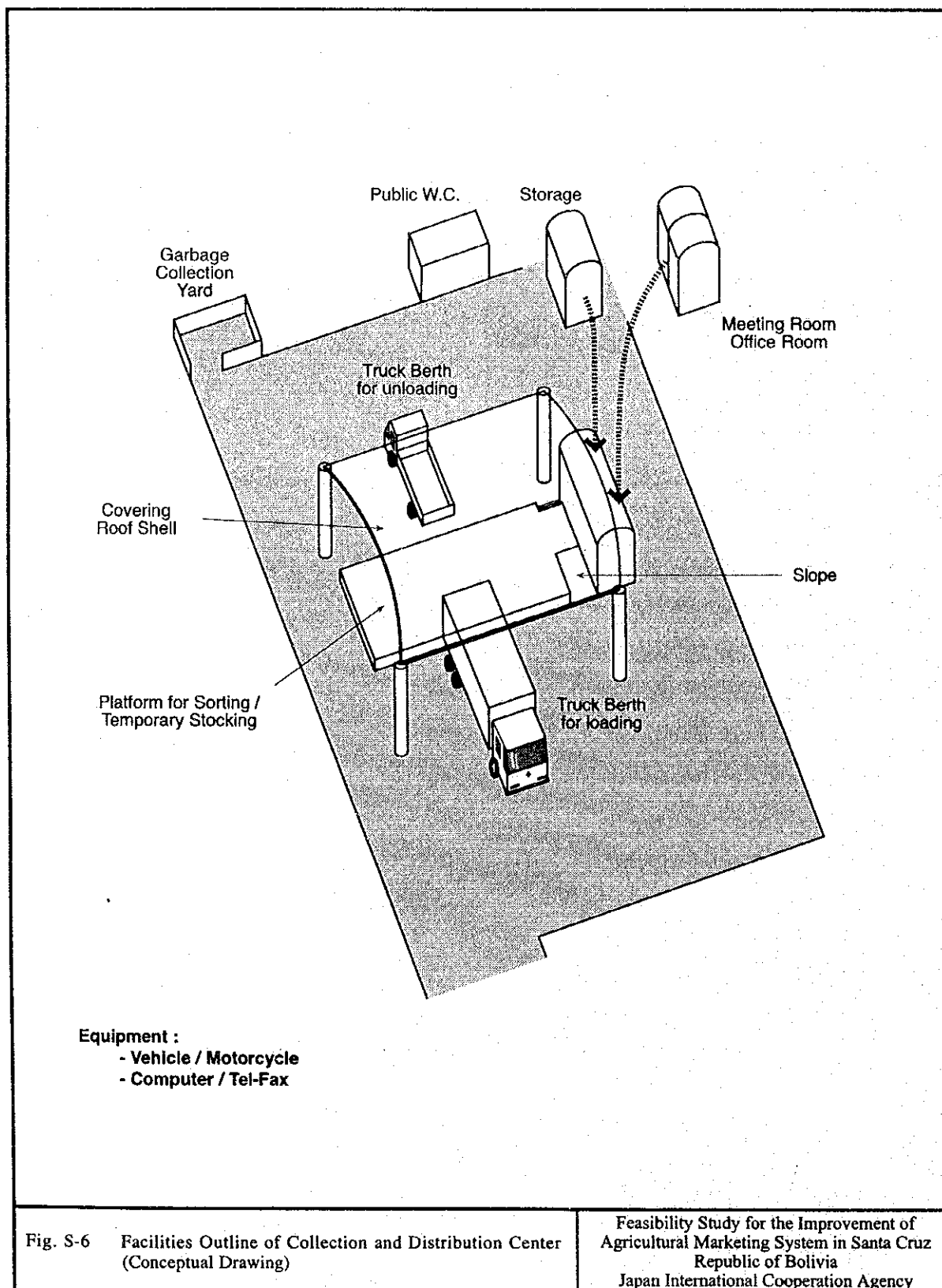
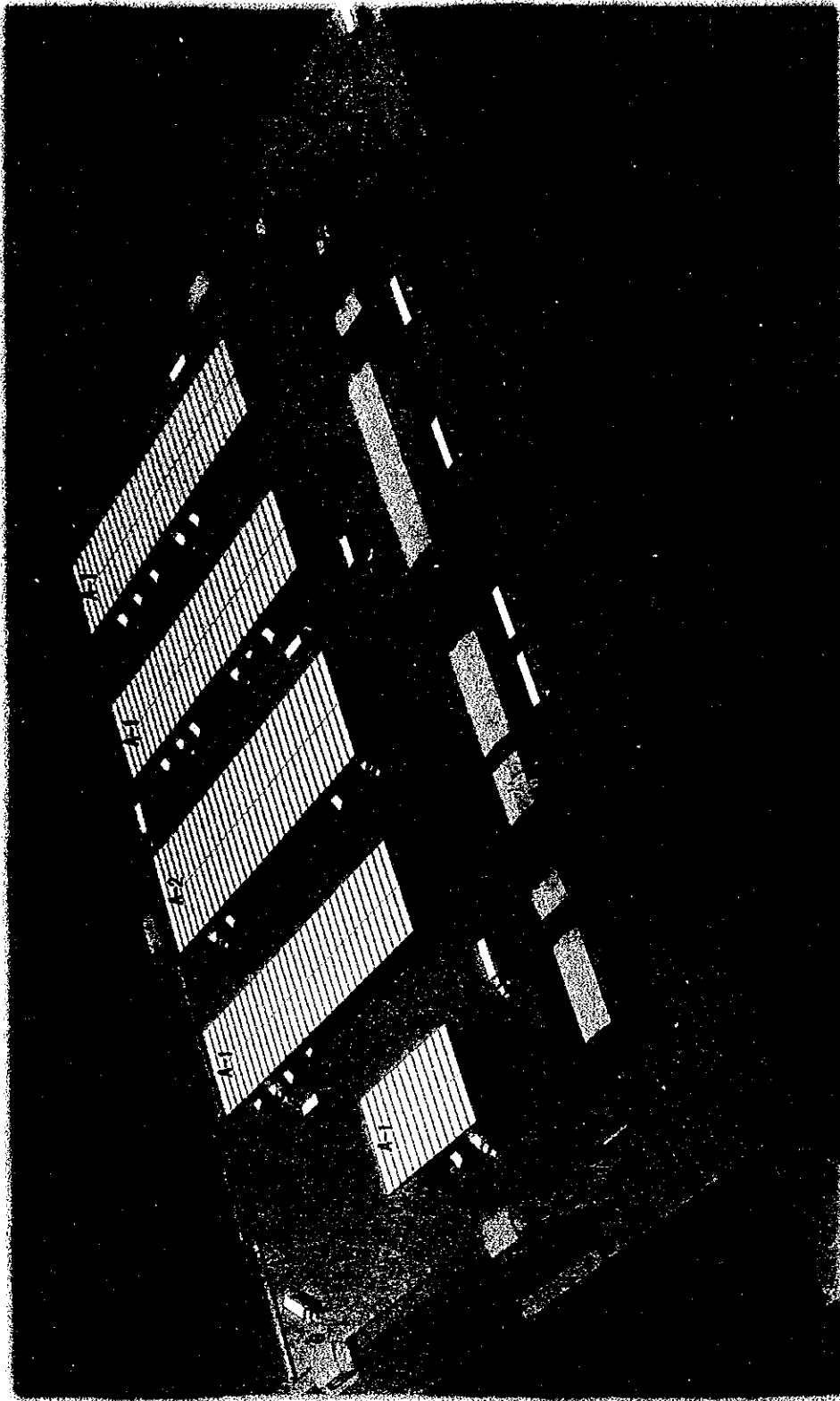


## 6.7 Outline of Project Facilities

Facilities of C/D centers and NWM are shown in Figs. S-6 and S-7 respectively. The plan for the reorganization of the sales section of the existing Abasto Market is shown in Fig. S-8.





LEGEND A-1 : Marketing Hall-1 A-2 : Marketing Hall-2 B : Administration Office C : Canteen D : Shops E : Electric Power Station  
 F : City Water Reservoir/Elevated Water Tank G : Public W.C. H : Waste Water Treatment/Seepage Pit I : Garbage Collection Yard J : Guard Box

Fig. S-7 Major Facilities of New Wholesale Market (Bird's Eye View)

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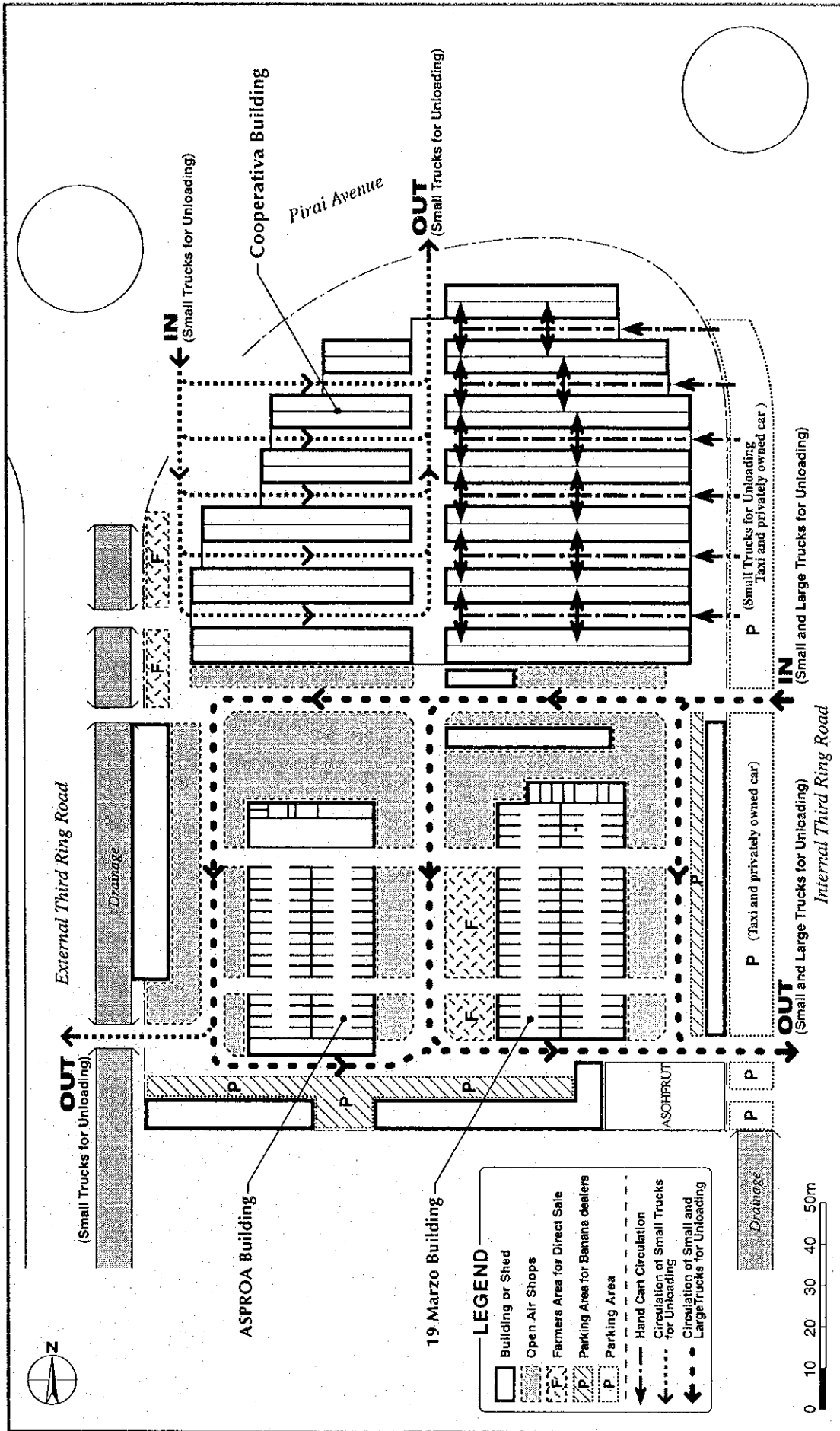


Fig. S-8 Plan of Re-arrangement for Sales Areas in Abasto Retail Market

## 6.8 Institutional Coordination and Management of the Project

### (1) National Level Coordination

The Ministry of Agriculture, Cattle and Rural Development will be responsible for monitoring the preparation, construction and management of facilities, as well as coordination among relevant agencies for fund arrangement and technical assistance.

### (2) Regional Level Coordination

Concerning the construction and management of the Project, the "Mixed Board" is to be established, comprised of representatives of the Prefecture of Santa Cruz, Municipal of Santa Cruz, 7 municipalities of the Valley areas, and 7 users' organizations in Abasto Market. This body carries out establishment of implementation system and relevant rules/ regulations for construction and management, as well as training, request for technical assistance and financial arrangement in pursuit of efficient and effective project implementation. Also, the Board is to supervise the Project throughout the term of construction and management.

The Mixed Board will contain two project offices within its organization, which primarily undertakes forming annual implementation plan, human resource management, budget allocation, supervising expenditure, along with supporting activities for project management of each site. The two project offices are; one for C/D center management (Project Office No.1), and the other for the NWM and Abasto Market (Project Office No.2).

### (3) Management of the Project

Following the completion of the project, their management and operations should be implemented by users' organizations with the guidance and supervision of the Prefecture and Municipal, and political interference should be eliminated. In order to secure the trust of the facility's users, it is vital that the method of operations and the accounting books are made public and transparent. The municipalities (Prefecture and municipalities) will take the lead in effectively utilizing assistance organizations and farmer organizations such as ASOFRUT, EMCA, CAISY, CAICO, and others to establish the management system of the Collection and Distribution Centers and the New Wholesale Market. In the consumption area, the management system of the NWM and Abasto Market should be established with the consent of wholesalers in Abasto Market, producers' organizations, agricultural cooperatives and supermarkets' associations that are participating in NWM as well as traders who remain in Abasto Market. The Management Committee of the Market comprised of major users will be created and the Management Body of the facilities will be organized under this Committee. The Management Body will be responsible for overseeing the full use of the entire facility's functions and an important issue will be to establish an independent management system run by user organizations.

It is also recommended that the collection/distribution centers, the New Wholesale Market and Abasto Market are managed by a private company in

future (a private company established by capital provided by users' organizations or a company consigned by users).

There is a need to create a New Wholesale Market law/regulation. However, it is difficult to establish a New Wholesale Market law at the national level in view of the historical process by which the agricultural market was created and the existing legal system. Therefore, it is more realistic to establish a management system and an operating procedure for the New Wholesale Market in accordance with a municipal ordinance of Santa Cruz City.

The above institutional arrangement for project implementation is illustrated in Fig. S-9.

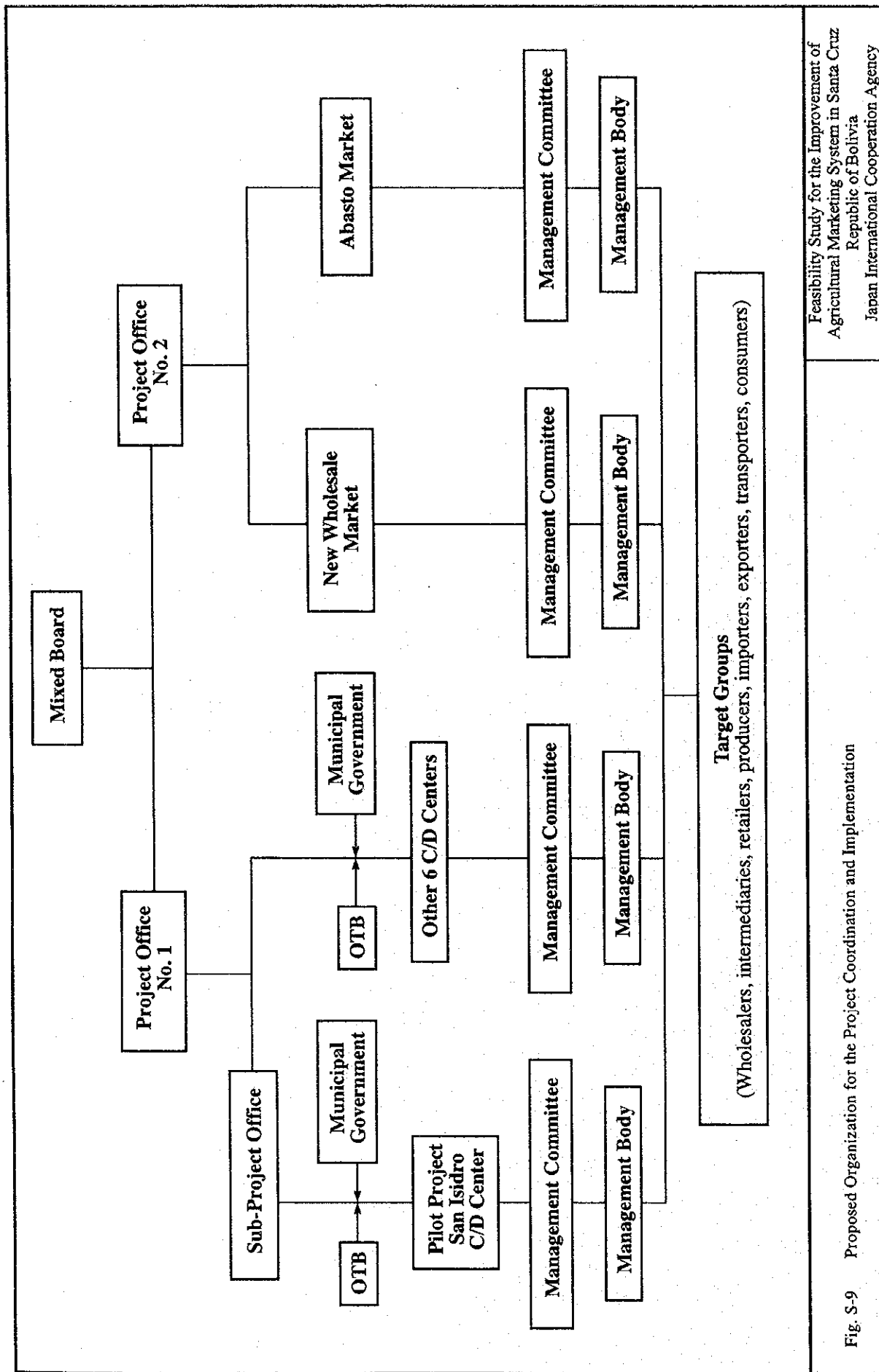
## **6.9 Training and Technical Assistance**

Training to relevant personnel (government staff, representatives of supporting organizations and of users responsible for promoting the Project) will be performed from the preparation stage of the Project implementation led by the Prefecture and municipalities. The major constituent of the training pertains to establishment of law/regulation and organization, and management of facilities.

Technical assistance for such trainings will include technical training programs in other countries where wholesale activities have become established, the dispatch of technical advisors to Bolivia, etc. In turn, personnel who have participated in these trainings will be responsible for implementing training programs for the users targeted by the Project.

In implementation stage of the Project, the following measures will be taken in production and consumption areas. The training for farmers on cooperative collection and distribution and establishment of planned production system will be conducted by the Management Committee and/or Management Body through local governments and supporting agencies for farmers at collection/distribution centers in production areas. The training on management/operation and utilization of the market will be carried out for operating wholesalers as well as to farmers/traders newly participating in the New Wholesale Market. In either case, if the responsible agencies have difficulties in implementing training, technical assistance from other countries will be required (promotion of C/D center use, extension of new marketing system at the NWM, establishment of law/regulation and organization, and technology transfer for market management) in order to accomplish.

As regards training at Abasto Market, joining the training at NWM will be of use.



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Fig. S-9 Proposed Organization for the Project Coordination and Implementation

## **7 Project Implementation Plan**

### **7.1 Preliminary Coordination Stage**

Based on the results of this Study, the Project will be situated in the frameworks of national, prefectural and municipal plans (council approval), after which consensus building among relevant agencies and procedures for expenditure of the fiscal year will begin. In Santa Cruz Prefecture, the Department of Sustainable of Development (or a newly established department responsible for the Project through reorganization of the Prefecture) and the Department of Economic Development will take primary responsibility for coordination with organizations in the Prefecture necessary for the Project implementation. In the Municipal of Santa Cruz, the City Planning Council and Secretariat of Public Works are chiefly in charge of coordination within the Municipal.

The Prefecture and Municipal of Santa Cruz will each set up an office for the Project implementation in order to satisfy necessary procedures for the establishment of the "Mixed Board Inception Committee". The two offices in the Prefecture and the Municipal are independent of one another at this stage, though they are to hold regular meetings to promote understanding and conduct required undertakings. The Bolivian side is to proceed with request letters for technical assistance and funding to assist with the Project implementation.

Promptly after its establishment, the Office in the Prefecture will begin training for producers to organize themselves with mass guidance, one component of the whole training programme. This training will enable the next training programme and on-the-job or on-the-site training to be carried out as soon as the implementation stage begins. Simultaneously, producers will be instructed on gaining user qualification of the NWM and Abasto Market.

### **7.2 Preparatory Stage**

The Mixed Board Inception Committee is responsible for drafting law/ regulations over the Mixed Board's objectives, functions, organizational structure and management. The Mixed Board will be set up through approval of both Prefectural and Municipal Councils. The Inception Committee is also in charge of transfer promotion including preliminary selection of qualified persons, in avoidance of serious troubles when the Mixed Board begins to conduct the actual transfer of wholesalers from the existing Abasto to NWM.

### **7.3 Implementation Stage**

The Mixed Board will formulate and execute the Project implementation plan (objective, function, organizational structure, human resource allocation, budget allocation). The Mixed Board will have two Project Offices that are mainly responsible for the formulation of annual implementation scheme, human resource allocation, budget allocation and supervision of expenditure and supporting activities for individual project management in each site.



(1) Collection and Distribution Center

At the Pilot Project in San Isidro, the management regulations are enforced, annual implementation plan and training programs implemented by the Management Committee and the Management Body.

The Pilot Project will be followed as the model by other 6 sites for C/D centers, and will act as the core for training and its technical assistance in the production site. The establishment of C/D centers in other 6 sites will be gradual and begin only after the management of Pilot Project becomes stable and its results observable.

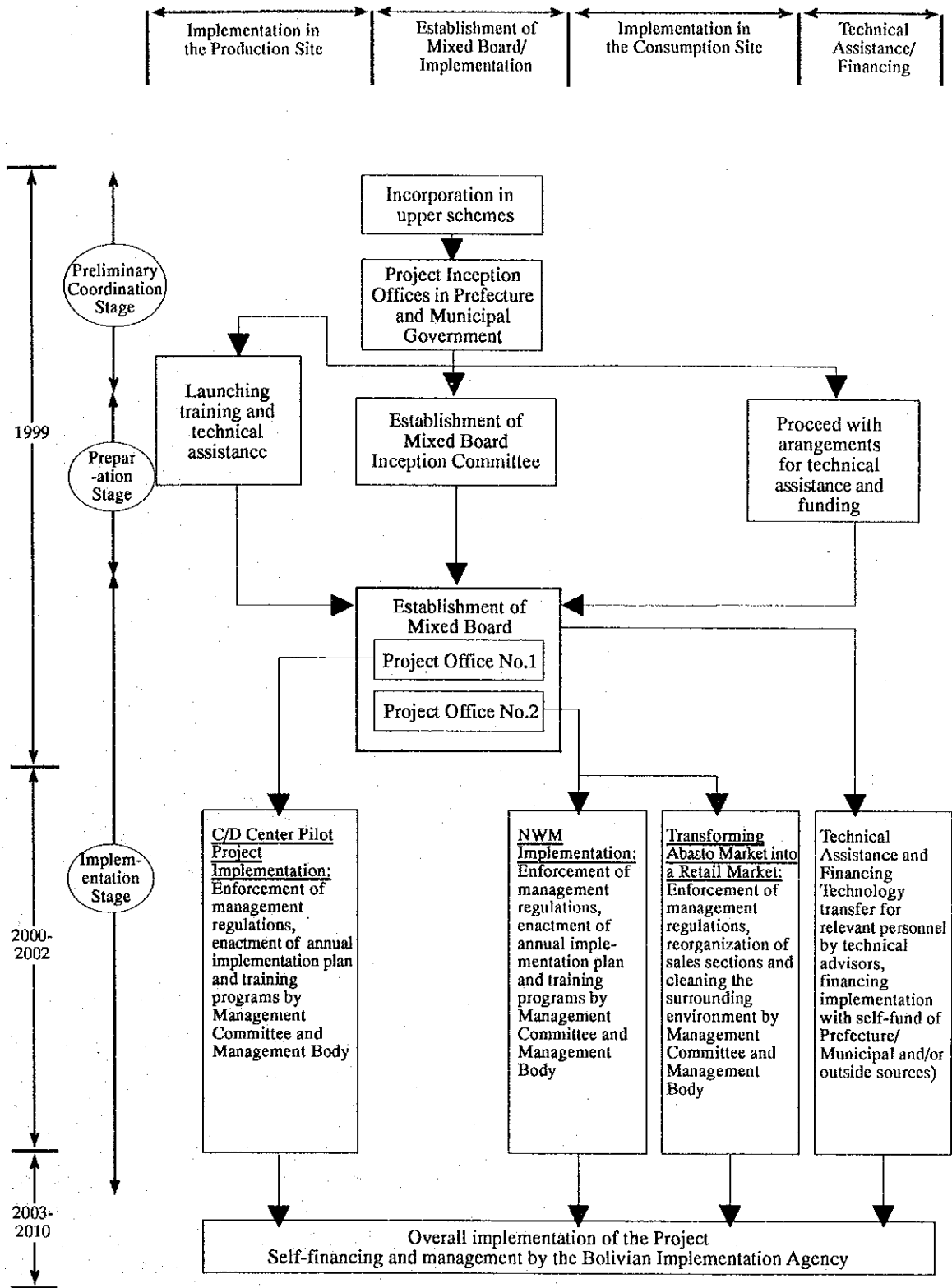
(2) NWM

The Management Committee and Management Body enforce the management regulations and implement annual implementation scheme and training programs.

(3) Existing Abasto Market

The Management Committee and Management Body enforce the management regulations and implement reorganization of sales sections and surrounding environment of the Market.

The process of Project implementation is shown in Fig. S-10. Also, Project implementation schedule is shown in Table S-4.



**Fig. S-10 Project Implementation Process**

Table S-4 IMPLEMENTATION SCHEDULE OF THE PROJECT AND TRAINING AND TECHNICAL ASSISTANCE FOR THE NEW WHOLESALE MARKET, ABASTO MARKET, AND C/D CENTERS

Item	1999												2000												2001												2002												2003												2004																																			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12																								
<b>Development of the Project Structure</b>	Tentative												Final												Final												Final												Final												Final																																			
1. Preparation and submission of request letter on financial aid and technical assistance	▲												▲												▲												▲												▲												▲																																			
2. Office for project preparation	▲												▲												▲												▲												▲												▲												▲																							
3. Preparation Committee	▲												▲												▲												▲												▲												▲												▲																							
4. Mixed Board	▲												▲												▲												▲												▲												▲												▲																							
5. Project Office for NWM, Abasto Mkt. & C/D Centers	▲												▲												▲												▲												▲												▲												▲																							
<b>Development of NWM and Abasto Market</b>	▲												▲												▲												▲												▲												▲												▲																							
1. Management Committee of NWM	▲												▲												▲												▲												▲												▲												▲												▲											
2. Management Body of NWM	▲												▲												▲												▲												▲												▲												▲												▲											
3. Management Committee of Abasto Market	▲												▲												▲												▲												▲												▲												▲												▲											
4. Management Body of Abasto Market	▲												▲												▲												▲												▲												▲												▲												▲											
5. Development of Law/Regulation of NWM	▲												▲												▲												▲												▲												▲												▲												▲											
6. Development of Law/Regulation of Abasto Market	▲												▲												▲												▲												▲												▲												▲												▲											
7. Qualification / Registration of Wholesalers	▲												▲												▲												▲												▲												▲												▲												▲											
8. Land Acquisition and Site Preparation	▲												▲												▲												▲												▲												▲												▲												▲											
9. Design and Construction of the NWM	▲												▲												▲												▲												▲												▲												▲												▲											
10. Management and O/M of the NWM	▲												▲												▲												▲												▲												▲												▲												▲											
11. Management and O/M of the Abasto Market	▲												▲												▲												▲												▲												▲												▲												▲											
<b>Training in NWM</b>	▲												▲												▲												▲												▲												▲												▲												▲											
1. Program of Domestic Training and Technical Assist.	▲												▲												▲												▲												▲												▲												▲												▲											
2. Implementation of Domestic Training and TA	▲												▲												▲												▲												▲												▲												▲												▲											
For Group A - Marketing System	▲												▲												▲												▲												▲												▲												▲												▲											
- Law/Regulation and O/M	▲												▲												▲												▲												▲												▲												▲												▲											
For Group B - Marketing System	▲												▲												▲												▲												▲												▲												▲												▲											
- Law/Regulation and O/M	▲												▲												▲												▲												▲												▲												▲												▲											
For Group C - Organizing Small Scale Producers/Trader	▲												▲												▲												▲												▲												▲												▲												▲											
- Rule/Regulation and O/M	▲												▲												▲												▲												▲												▲												▲												▲											
3. Study Tour in CBB	▲												▲												▲												▲												▲												▲												▲												▲											
For Group A	▲												▲												▲												▲												▲												▲												▲												▲											
For Group B	▲												▲												▲												▲												▲												▲												▲												▲											
<b>Development of C/D Centers in Production Areas</b>	▲												▲												▲												▲												▲												▲												▲												▲											
1. Program of Domestic Training and Technical Assist.	▲												▲												▲												▲												▲												▲												▲												▲											
2. Sub-Project Office (Pilot Project)	▲												▲												▲												▲												▲												▲												▲												▲											
San Isidro C/D Center (Pilot Project)	▲												▲												▲												▲												▲												▲												▲												▲											
Steering Committee for Development	▲												▲												▲												▲												▲												▲												▲												▲											
Technical Extension	▲												▲												▲												▲												▲												▲												▲												▲											
Construction	▲												▲												▲												▲												▲												▲												▲												▲											
Steering Committee for O & M	▲												▲												▲												▲												▲												▲												▲												▲											
Operation of C/D Center	▲												▲												▲												▲												▲												▲												▲												▲											
3. Samaipati C/D Center	▲												▲												▲												▲												▲												▲												▲												▲											
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4. Vallegrande & Saipina C/D Center	▲												▲												▲												▲												▲												▲												▲												▲											
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Operation of C/D Center	▲												▲												▲												▲												▲												▲												▲												▲											
5. Mairana, Pampa Grande, & Comarapa C/D Centers	▲												▲												▲												▲												▲												▲												▲												▲											
Steering Committee for Development	▲												▲												▲												▲												▲												▲												▲												▲											
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Operation of C/D Center	▲												▲												▲												▲												▲												▲												▲												▲											
<b>Training in C/D Centers</b>	▲												▲												▲												▲												▲												▲												▲												▲											
1. San Isidro C/D Center (Pilot Project)	▲												▲												▲												▲												▲												▲												▲												▲											
Institutional Training	▲												▲												▲												▲												▲												▲												▲												▲											
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Quality Control and Accounting	▲												▲												▲												▲												▲												▲												▲												▲											
2. Samaipati C/D Center	▲												▲												▲												▲												▲												▲												▲												▲											
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Quality Control and Accounting	▲												▲												▲												▲												▲												▲												▲												▲											
3. Vallegrande & Saipina C/D Center	▲												▲												▲												▲												▲												▲												▲												▲											
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Quality Control and Accounting	▲												▲												▲												▲												▲												▲												▲												▲											
4. Mairana, Pampa Grande, & Comarapa C/D Centers	▲												▲												▲												▲												▲												▲												▲												▲											
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Quality Control and Accounting	▲												▲												▲												▲												▲												▲												▲												▲											
<b>Training in Foreign Country and Technical Assistance by Foreign Expert</b>	▲												▲												▲												▲												▲												▲												▲												▲											
1. Preparation and submission of Request Letter for TA for Foreign Country	▲												▲												▲												▲												▲												▲												▲												▲											
2. Program of Training and TA by Foreign Country	▲												▲												▲												▲												▲												▲												▲												▲											
3. TA by Expert from Advanced Country	▲												▲												▲												▲												▲												▲												▲												▲											
I. Preparation Stage	▲												▲												▲												▲												▲												▲												▲												▲											
A- Long Term Technical Advisor for C/D, NWM, and Abasto Market (2 years)	▲												▲												▲												▲												▲												▲												▲												▲											
B- Short Term Technical Advisor for C/D Pilot Project (1 year)	▲												▲												▲												▲												▲												▲												▲												▲											
II. Implementation Stage	▲												▲												▲												▲												▲												▲												▲												▲											
C- Long Term Technical Advisor for Coordination and Rationalization of Marketing (4 years)	▲												▲												▲												▲												▲												▲												▲												▲											
D- Long Term Technical Advisor for C/D, Joint Shipment and Sales (5 years)	▲												▲												▲												▲												▲												▲												▲												▲											
E- Long Term Technical Advisor for Quality Control and Accounting System on Joint Collection / Distribution (2 years)	▲												▲												▲												▲												▲												▲												▲												▲											
F- Long Term Technical Advisor for Management and O/M of NWM and Abasto Market (4 years)	▲												▲												▲												▲												▲												▲												▲												▲											
4. Training in an Advanced Country	▲												▲												▲												▲												▲												▲												▲												▲											
For Group A	▲												▲												▲												▲												▲												▲												▲												▲											
5. Study Tour in MERCOSUR Country	▲												▲												▲												▲												▲												▲												▲												▲											
For Group A	▲												▲												▲												▲												▲												▲												▲												▲											

Remarks: NWM: New Wholesale Market; C/D Center: Collection/Distribution Center; MC: Management Committee; MB: Management Body; OM: Operation/Maintenance



## **8 Evaluation of the Project**

An evaluation of three possible scenarios for the Project have been prepared – Scenario 1: a project limited to creating Collection and Distribution Centers, Scenario 2: a project limited to establishing a New Wholesale Market, and Scenario 3: a project concerned with establishing Collection and Distribution Centers and a New Wholesale Market.

### **8.1 Project Costs**

The total project cost to establish seven Collection and Distribution Centers is US\$2,851,770. The total project cost to construct a New Wholesale Market is US\$18,694,423 with the construction work divided into two phases. The construction costs for phase I and II are estimated at US\$10,347,857 and US\$8,346,566, respectively.

### **8.2 Evaluation of the Project**

#### **(1) Economic evaluation**

In the case of a project limited to establishing solely Collection and Distribution Centers, the EIRR is 9.7 percent, 11.8 percent for a project limited to constructing a New Wholesale Market, and 12.6 percent for a project concerned with establishing both Collection and Distribution Centers and a New Wholesale Market. According to the results of a sensitivity analysis, the EIRR will vary by about 10% with an increase or decrease of 10% in the investment / benefits item despite high project costs or lowered benefits.

#### **(2) Financial evaluation**

FIRR for a project establishing C/D Centers only is -2.2%, 7.7% for only NWM establishment, and a project establishing both C/D Centers and NWM marks an FIRR of 6.6%.

#### **(3) Potential for Privatization**

If the New Wholesale Market was to be managed by a private company, the following two scenario cases are plausible. However, due to the public nature of the market, management responsibility, consideration of the impediment caused by monopoly, and profitability concern, privatization is regarded unlikely for the time being.

Private sector participation from the initial start of the Project: The wholesalers' sections of the market halls are constructed by Santa Cruz city or by a private developer at the same cost as constructing a local retail market. These wholesalers' sections are then sold to users. In this case, it will be necessary to introduce a system of Municipal or Prefectural subsidies to cover a portion of the construction costs, in order to enable users to make a profit. Additionally, all other publicly owned facilities within the market that are not expected to generate revenue will be constructed and operated by the municipal government (exception will be entrance fees collected from trucks which are

nominal). As a result, the municipal government will be responsible for raising the entire depreciation and operating costs.

- Privatization after a specified period of time: The initial investment costs will be dependent on financial assistance from the department and municipal governments and donor countries. The municipal government will be responsible for carrying out technology transfer activities with the aim of establishing a wholesale company. Following the establishment of a financial base, it will be possible for the operating costs of the entire market and a segment of the depreciation costs (of the wholesalers' section only) to be paid by the wholesale company from the revenue generated.

(4) Other benefits

Effective use of the site previously used for wholesale activities within the existing Abasto Market, the parking lot surrounding Abasto Market, alleviation of environmental problems in the surrounding areas of the market, and active commercial activity in the surrounding areas of the New Wholesale Market are some of the anticipated added benefits.

### 8.3 Evaluation of Environmental Impact

- Temporary problems stemming from increased traffic such as noise and dust, as well as solid wastes and water pollution at the production areas are anticipated, but these problems are expected to be minor. However, a secondary impact stemming from the social effects on beneficiaries and skyrocketing land prices of the surrounding areas of the Project are surmised. Therefore, the municipality which will supervise the Collection and Distribution Centers will be responsible for providing equal and fair opportunities for all users.
- Existing Abasto Market: Due to the removal of the market's wholesale functions, traffic congestion, noise, waste disposal, stench, pollution of the waste water ducts, unsanitary conditions, etc. will improve. Transitions in commerce methods and lifestyle patterns of market users will occur and the loss of employment opportunities and the influx of new wholesalers will create social problems. In addition, there is concern that social problems will arise from the use of the former wholesale site following the transfer of these activities to the New Wholesale Market. The Santa Cruz municipal government must implement appropriate countermeasures that will, in principle, address these social problems through fair and equal opportunity.
- New Wholesale Market: Temporary noise, dust and traffic congestion are anticipated during the construction stage. However, the major environmental problems are the disposal of waste water and solid wastes. Countermeasures by the municipal government to address these problems are anticipated. It is also important that fair and equal opportunity is provided for all users.

## **9 Funding Plan**

### **9.1 Construction Funds**

#### **(1) Collection and Distribution Centers**

FDC or other outside sources will provide the financial resources for construction funds. However, the FDC is limited to providing only 90 percent at the maximum of the total construction costs and the remaining 10% at the least must be borne by the municipality responsible for the construction and operation of the facilities and the beneficiaries of the market (the OTB). It is alternatively possible for beneficiaries to bear the costs in the form of labor and materials.

#### **(2) New Wholesale Market**

Construction funds will be provided by the Prefecture, Municipal or outside sources.

- Funds provided solely by the Prefecture and Municipal: Purchase cost of the lot, preparation costs of the lot, installation of infrastructure of the market and its surrounding areas
- Funds obtained under the responsibility of the Prefecture and Municipal: Market facility construction costs, procurement cost of equipment, access road construction costs, and re-investment cost.

### **9.2 Operating Funds**

#### **(1) Distribution of funding responsibility for operation cost, training and technical assistance cost**

As was described in the previous section, the initial investment will be borne by the Municipal, Prefecture and responsible municipalities out of their own fund or by procuring from outside sources. Regarding operation cost, training/ technical assistance cost of the C/D Centers, NWM and Abasto Market, the following measures should be taken.

- 1) The operation cost of the Mixed Board and affiliated Project Offices/ Sub-Project Office to be established for the Project implementation will be borne by the Prefecture and Municipal.
- 2) Training/ technical assistance cost will also be borne by the Prefecture and Municipal.
- 3) The cost of facility operation other than mentioned in 1) and 2) is basically users' responsibility, though appropriate favorable treatment is strongly recommended (e.g., mediation of low-interest credit by the Prefecture and Municipal, loan provision by the Prefecture and Municipal through their own use of low-interest credit, etc.).

(2) C/D Centers

Particularly at the initial stage of operation, the Management Body will have to develop a financial system based on feasible users' fee while the favorable treatment by the Prefecture and municipalities mentioned in (1) is applied.

(3) NWM

The initial start-up operating funds must be procured by the management body while receiving the above mentioned favorable treatment, under the supervision of the New Wholesale Market Management Committee. Personnel costs and facility maintenance and management costs will be covered by the management body utilizing fees collected from market users.

A vital component of the market's sound management is the establishment of a transparent system of finance needed to maintain the trust of the management (periodic financial reports to the market operating committee comprised of user representatives and public disclosure to users). In addition, operating funds procured from users will not be incorporated in the financial resources of the department or municipal government, but will be pooled into the financial system created for their direct use as operating capital of the Project.

## 10 Conclusion and Recommendation

### 10.1 Conclusion

The Project is to develop a wide-range fruit and vegetable marketing system centered around the Department of Santa Cruz, which will enable generation of proper benefit to small-scale producers and all traders with sufficient economic effect to the national economy. The new marketing system of fruits and vegetables to be developed in place of the traditional marketing system will set the Collection and Distribution Centers in the major production area and the New Wholesale Market/ existing Abasto Market in the consumption area as the target Project (core). This target Project will be managed and used mainly by relevant municipalities, supporting organizations and users under the decentralization policy. Sufficient preparation and technology transfer is necessary in preventing confusion of management after the new Project is established, as seen in the existing Abasto Market. A gradual implementation is important for facility/ equipment installation of the Project, to avoid anticipated friction and damage in case of rapid transformation of the marketing system.

### 10.2 Recommendations

(1) Incorporation into National, Prefectural and Municipal Plans

The Project should be incorporated in the National Agricultural Development Plan, and plans at the Prefectural and Municipal levels currently being developed.

(2) Law/ institution and management

- Establishment of management organizations: It is preferable if the municipal takes the initiative in developing the management scheme of C/D Centers and



the New Wholesale Market through effective application of producers' organizations or supporting bodies. After the completion of the facilities, actual operation will be undertaken by organizations that users are primarily responsible for, and political intervention should be avoided at all cost. Each facility in the production and consumption areas will have a management committee consisting of representatives of users as an upper body, with an affiliated operation body. The operation body is expected to maintain the function of the whole facility running, for which the establishment of self-management by users is an important issue.

- Establishment of management law/regulations: As to the New Wholesale Market, Wholesale Market Law is required. It appears difficult to newly issue such a law, from the perspectives of existing legal system and historical process of agricultural market formulation. An ordinance by the Municipal of Santa Cruz regarding management system and method is more practicable.

(3) Training and technical assistance

From the initial stage of preparing for the Project implementation to the completion of construction and launching operation, training and technical assistance to government personnel and users is necessary through domestic/international support.

(4) Implementation system

At the national level, mainly the Ministry of Agriculture, Cattle and Rural Development is to arrange with relevant institutions. At the local level, the Mixed Board should be established within the Prefectural Government. The Board is composed of representatives from the Prefecture, Municipal and users. Project Office should be established under this Board for administering the Project implementation.

(5) Implementation plan

1) Preliminary Coordination Stage

Based on the results of the Study, discussion among Santa Cruz Prefecture, Santa Cruz Municipal, and relevant municipalities will define the Project's place in the upper scheme of each municipal authority (regional development plan). At the same time, it is required to commence necessary procedures for funding and technical assistance for the Project implementation.

2) Preparatory Stage

Inception Committee to draft the legal basis to establish the Mixed Board that will be responsible for the implementation of the Project, will be set up. Training and technical assistance for relevant personnel on Project implementation will begin.

3) Implementation Stage

Mixed Board will be established via aforementioned legal procedure as an implementation agency of the Project, to administer the whole Project from its launching. Management over implementation includes establishment of

Management Committee, Management Body, and management regulations, enforcement of the regulations for each project. The following items require early arrangement.

- C/D center: Establishment of Pilot Project
- NWM: Assisting transfer of wholesalers, appropriation of site for the NWM construction, land preparation work, etc.
- Abasto Market: Arrangement for rehabilitation of Abasto Market into an efficient retail market.
- Proceed with training programs and technical assistance programs from preparatory stage.

(6) Financing

The construction cost of the Collection and Distribution Centers will be procured from funds that are beneficial to users such as FDC and other outside sources. As for the New Wholesale Market construction, the cost should be covered by the self-fund of the Prefecture or Municipal or fund procured from other sources on their responsibility. Costs for facility operation, maintenance and reinvestment should be covered by users' fee in principle, though the Prefecture and Municipal need to take appropriate favorable measures in order to minimize users' burden.

(7) Relevant Infrastructure Installation and Environment

- Considering that a residential area may be developed around the target area, necessary water supply line should be secured.
- In accordance with the urban development plan, the Municipal Government of Santa Cruz should install accessing roads to the New Wholesale Market and relevant infrastructure for sewage system, garbage disposal, etc.
- Increasing fruit and vegetable production in the Valley areas depends much on the progress of the irrigation schemes. Promotion of irrigation schemes is crucial.

# MAIN REPORT

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## Units of Measurement

Bs	Bolivianos, Bolivian currency
US \$	US dollars, US currency: US\$ 1.00 = Bs. 5.62
mm	millimeter(s)
cm	centimeter(s)
m	meter(s)
km	kilometer(s)
km <sup>2</sup>	square kilometer(s)
ha	hectare(s)
m <sup>2</sup>	square meter(s)
kg	kilogram(s)
t	ton
arroba(s) / @	1 arroba = 25 lbs. = 11.5 kg
quintal	1 quintal = 100 lbs. = 46.5 kg
arroma	bunch, weight depends on the product
bolsa	sack, weight depends on the product
caja	box, weight depends on the product
canasta	basket, weight depends on the product
racimo	stalk, weight depends on the product
%	percent
°C	degree(s) centigrade
db	decibel(s)

## Abbreviations

ACPAMA	Association of Merchants
AIPPA	Integral Association of Small-scale Agricultural and Livestock Producers
AMALA	Abasto Market Lake Alalai Association
ANAPO	National Association of Vegetable Oil Crops
ASOFRUT	Association of Fruit and Vegetable Producers
ASOPROCE	Association of Cereal Products Suppliers
ASPROA	Association of Small-scale Livestock Producers
IDB	Inter-American Development Bank
C/D	Collection/Distribution
CADEX	House of Exporters of Santa Cruz
CAINCO	House of Industry and Commerce of Santa Cruz
CAISY	Integral Livestock Cooperative of San Juan de Yapacani
CAO	House of Agricultural and Livestock Farmers of the East
CIAT	Center of Tropical Agricultural Investigation
CIPCA	Center of Investigation and Promotion of the Farmer
CLISA	Clean City Corporation
COB	Bolivian Labor Headquarters
CODER	Departmental Council of Irrigation
CORACA	Agrarian Farmers' Corporation
CORDECRUZ	Regional Development Corporation of Santa Cruz
CRAMA	Regional Council of Livestock Supply and Market
DF/R	Draft Final Report
DNMA	National Office of Agriculture and Livestock Marketing
EFA	Railroad Company
EFO	Railroad Company of the East
EIA	Environmental Impact Evaluation
EMCA	Livestock Commercializing Company
EMDELU	Municipal Company of Urban Cleaning
ENAFER	Railroad Company of Peru
ENDE	National Company of Electricity
F/R	Final Report
F/S	Feasibility Study
FAO	United Nations Organization for Agriculture and Nutrition
FDC	Farmer Development Fund
FSE	Social Emergency Fund

FSUTCSC	Unique Federation of Farm Workers' Syndicate of Santa Cruz
FINDESA	Financial Development of Santa Cruz
GDP	Gross Domestic Product
GTZ	German Technical Cooperation Society
ICI	Institute of Credit Intermediaries
ICO	Eastern Training Institute
IC/R	Inception Report
IEE	Initial Environmental Evaluation
IGM	Military Geographical Institute
INE	National Statistics Institute
IT/R	Interim Report
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
KfW	Kreditanstalt für Wiederaufbau
MACA	Ministry of Farmers and Livestock Affairs
MAGDR	Ministry of Agriculture, Cattle and Rural
MERCOSUR	Common Market of the Southern Cone
M/P	Master Plan
NGO	Non-Governmental Organization
NWM	New Wholesale Market
O/D	Origin/Destination
O/M	Operation and Management
OJT	On-the-Job Training
OTB	Territorial Base Organizations
OTPR	Technical Office of Regulating Plan
PAIS	Social Food Support Project
PCELA	Computerized Procedure for Environmental Impact Evaluation
PCM	Project Cycle Management
PDA	Agriculture and Livestock Development Project
PDM	City Development Plan
PDM	Project Design Matrix
PETHOSAM	Vegetable Processing Plant, Co.
PPM	Project Planning Matrix
PRECONAT	Ecology and Nature Program
PRICRUZ	Irrigation Project Comarapa-Saipina-San Rafael, Prefecture of Santa Cruz
PRODECAF	CORDECRUZ Project for Micro-Regional Development in Caballero and Florida
PRODEM	Promotion and Development of Micro Enterprises

PRODEVA	CORDECRUZ Program for Micro-regional Development in Vallegrande
PR/R (1)	Progress Report 1
PR/R (2)	Progress Report 2
RRC	Regional Research Center
S/W	Scope of Work
SAGUAPAC	Sewage and Potable Water Service
SNAG	National Secretariat of Agriculture and Livestock
SNC	National Road Service
STMMC	Manuel Maria Caballero Transporters' Syndicate
UNDP	United Nations Development Program
UPRA	Unit Program for Rural, Agriculture and Livestock
USAID	United States Agency for International Development
UV	Ward Unit
WHO	World Health Organization
WUG	Water Users' Group
ZAPU	Potentially Urbanized Agricultural Zone



## 1 INTRODUCTION

### (1) Background of the Study

In 1994, the Government of Bolivia issued the "New Socio-economic Development Program (94~97)", which established the improvement of agricultural marketing system as an urgent task to be undertaken. The task is related to supporting small-scale farmers and rural women entrepreneurs in sales business. In addition, the Bolivian associate membership to MERCOSUR gained in 1997 accelerated the urgency of the task.

Under such circumstances, the "Master Plan for the Improvement of Agricultural Marketing System in Santa Cruz" was formulated with the cooperation of the Government of Japan in 1995, in which an F/S implementation was proposed.

Directed by this proposal, the Government of Bolivia requested the Government of Japan in April 1996, technical assistance for the improvement project including; the proposed market construction and its management scheme, development of collection/ distribution system at production centers. The Government of Japan, following the request, dispatched a preparatory study team (S/W mission) in November 1997; result of which is the agreement upon Scope of Work (S/W) signed on 4 December 1997.

### (2) Outline of the Study

#### 1) Objectives of the Study

The objectives of this study was to improve of fruit and vegetable marketing system in Santa Cruz Department. It intended to prepare an improvement plan of overall agricultural marketing system between consumption site and production site, together with its feasibility study. Technology transfer was conducted throughout the study.

#### 2) Study Area

The study area was the Department of Santa Cruz; further focus was given to the following districts in the Department.

##### a) Consumption site: Santa Cruz metropolitan area

##### b) Production site:

- Valley areas: San Isidro, Los Negros, Vallegrande, Comarapa, Saipina, Mairana, Samaipata, Angostura
- Plain area: Chane

#### 3) Study Approach

The Study was implemented in two phases. In phase I (June to October 1998), the existing conditions pertaining to fruit and vegetable production, marketing, consumption, and export were analyzed and the basic concepts as well as the outline of the improvement plan were delineated. In phase II (October 1998 to May 1999), plans to improve fruit and vegetable collection and distribution, design of the wholesale market, proposal to strengthen the organizational structure was formulated together with their implementation plans and evaluations. Draft Final Report (DF/R) that encompassed the results of phase I

and phase II study was prepared, and was explained and discussed in Bolivia. The Study Team received comments from the Bolivian side, based on which the Team revised the DF/R to finalize the Final Report. JICA submitted this Final Report to the Bolivian side in June 1999.

(3) Progress of the Study

In July 1998, JICA dispatched the Study Team for F/S, and the study is in process with the cooperation of the Bolivian counterpart. Phase I Study is completed, and the following reports have been formed with their contents agreed on as referred in each minutes of meeting.

- 1) Inception Report: Minutes signed on July 20, 1998.
- 2) Progress Report (1): Minutes signed on September 9, 1998.
- 3) Interim Report: Minutes signed on October 30 and November 3, 1998.
- 4) Progress Report (2): Minutes signed on December 18 and December 21, 1998.
- 5) Draft Final Report: Minutes signed on March 8 and March 9, 1999.

## 2 EXISTING CONDITIONS AND REVIEW OF M/P

### 2.1 Relations with Upper Schemes

#### (1) Agricultural Development and Regional Development Policy

The Banzer administration is currently preparing the final draft of agricultural development plan. At the moment, the administration's policy can be seen in the "Action Plan 1997-2002" published in December 1997. According to this policy, the governmental policy will focus on equity (poverty alleviation), opportunity (social inequality adjustment), dignity (drug eradication) and institutional building (rebuilding of justice). Regarding marketing of agricultural products, the government is reviewing on expansion of taxation basis, improvement of administration system and modernization of custom office. These measures will be taken to generate larger revenue. Infrastructure development and integration of operation bodies are also important issues. Such rural development will contribute to modernization of agricultural system and poverty alleviation. The improvement of fruit and vegetable marketing is considered to be included in this plan.

Priority order of development plans identified and in the process of formulation by Santa Cruz Prefecture is as follows:

- Investment in infrastructure of road to solve transportation problems and to accomplish international road required for export corridor.
- Improvement of micro-irrigation infrastructure for small-scale farmers in the Valley areas.
- Improvement of drainage infrastructure and flow control system for immigrant farmers in the northern lowland area
- Strengthening basic support services for agricultural and industrial development through modernization and application of technology.

#### (2) City Development Policy for Santa Cruz City

##### 1) General Policies

Considering the urban expansion due to the continuous population growth, Santa Cruz City prepared following general policies in its Integral Urban Development Plan in 1993.

- Correction of the dispersed growth and low density
- Definition of the urban structure within the municipal jurisdiction
- Incorporation of urbanized area and consolidation of settlement
- Activation of development in city center
- Activation of district consolidation in the city for the future metropolitan growth

Santa Cruz City has been carrying out following actual plan for the policies mentioned above.

- To supply and consolidate facilities
- To increase large public spaces
- To adjust urban regulation to socio-economic conditions and infrastructure

- To give first priority to implementation of principal road

Santa Cruz City is now preparing its new City Development Plan scheduled to be completed in 1999.

## 2) City Planning Zones

Santa Cruz City is divided mainly into 5 types of city planning zones;

- Z1: Historic Center (central area of urban zone where historic and traditional buildings are located)
- Z2: Central of Compound Use (city block in the perimeter between Z1 and 1st Ring)
- Z3: Intermediate (area between 1st and 2nd Ring)
- Z4: External (area between 2nd Ring and the Municipal urban boundary)
- Z5: Industrial Park (north east of Santa Cruz City)

## 3) General Characteristics and Expansion Tendencies of Santa Cruz City

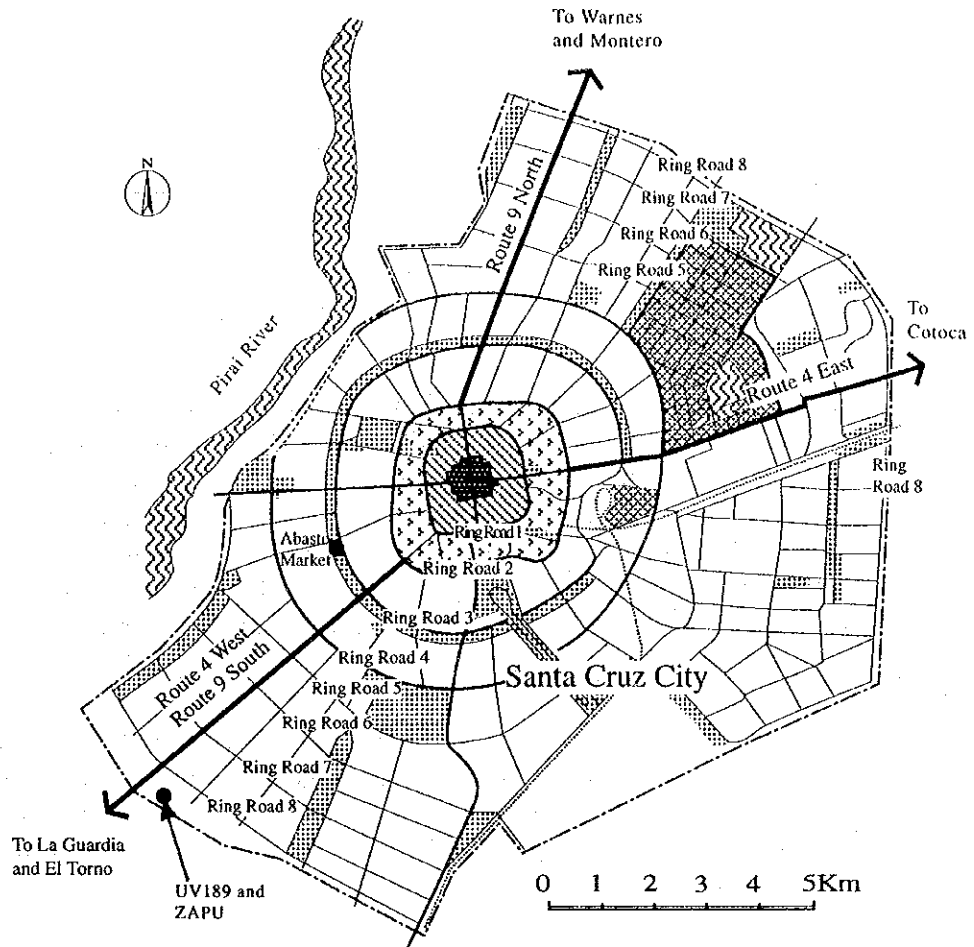
The area within 2<sup>nd</sup> Ring is utilized mainly as a high commercial zone. In addition, the area between Inner 3<sup>rd</sup> Ring and Outer 3<sup>rd</sup> Ring is also designated to be a high commercial zone.

Along Route 9 (Santa Cruz – Warnes) the tendency is related to the growth of residential and commercial areas. The area along Route 9 between Ring 3<sup>rd</sup> and Ring 8<sup>th</sup> is utilized as a high grade residential area.

Along Route No. 4 east (Santa Cruz – Cotoca) the expansion of residential areas is presently observed. Through Route No. 4 east agri-products like soybean, corn, beans, cotton and sunflower are transported to Santa Cruz from the Triangle Zone defined by Pailon, Los Troncos and Quimome. Soybean is transported to Brazil mostly by railroad system. Therefore many agro business company locate along this Route.

The land area along Route 9 East outside 8<sup>th</sup> Ring has the potential to become an industrial area for agri-products, since it has good accessibility for Soybean and beans products coming in from San Jose and Pailon area.

There is a general tendency of expansion along Route No. 4 west (Santa Cruz – La Guardia) that involves country houses (quintas). Between 1960 – 1970's, the land along Route No. 4 west (Santa Cruz – La Guardia) was used mainly for chicken farms. Today the people in this business have moved away towards the area beyond the town of Warnes and this land is utilized for the headquarters of big companies and so on. But some chicken farms still exist here. In fact, the towns of La Guardia and El Torno began as supply stops for truck drivers and other vehicles going from Santa Cruz towards Cochabamba and vice versa.



Outline of Santa Cruz City

4) Road Network and Railroad Network Condition In and Around Santa Cruz City

a) Existing Road Network Condition

There are difficulties for high tonnage transportation from Warnes to La Guardia (and vice versa) through Santa Cruz 3<sup>rd</sup> Ring except the night time (20:00-06:00) because of the traffic regulation. After completion of construction work of 4<sup>th</sup> Ring near River Pirai in this year, there will be no difficulties for high tonnage transportation in the daytime because 4<sup>th</sup> Ring has no traffic regulation to prohibit the high-tonnage transportation.

Regarding the transportation from Cotoca to La Guardia (and vice versa) through Santa Cruz City Ring, it is difficult to take clock wise direction because 3<sup>rd</sup> Ring is interrupted by the military airport (Trompillo airport), and the access to 4<sup>th</sup> Ring and 5<sup>th</sup> Ring is long although these 2 road are paved and available for heavy traffic.

b) Road network development plan

Regarding Route 4 East, Bolivian Central Government is proceeding development plan, i.e. (i) Road development plan for the section between Pailon and San Jose de Chiquitos, (ii) Road development plan for the section

between San Jose de Chiquitos and Puerto Suarez. The former's feasibility study was already completed, and it has been scheduled to start the construction work in 1999, and complete it by 2002. The latter's feasibility study will supposedly be finished within 1998, and they will carry out its construction works during 2000 and 2004.

Far from Santa Cruz to north east, for the section between San Rafael and San Matias (final destination: Brazilia), Central Government has also road development plan They had finished its feasibility study, but its construction schedule is not clarified yet.

Regarding Route 9 South, Central Government has road improvement plan for the section between Abapó and Camiri. Almost all of Route 9 south are paved except in this section, therefore they have already finished its feasibility study, and they have construction schedule to start it in 1999 and complete it by 2002. Regarding the Paraguay route from Boyuibe to Fortin Villazón (Paraguay), they are proceeding its feasibility study with Paraguay government jointly within 1998, and they hope to complete its construction work by 2002.

c) Rail road network toward other region

There is no possibility for the Santa Cruz Rail Road Station to be used as a base for cargo transportation to Brazil, since it was designed only as a passenger station (present and future). In case of soybean transportation from the above mentioned triangle zone to Brazil, the following 4 different stations are used mainly:

- Pailon Station
- Tres Cruces Station
- Pozo de Tigre Station
- San Jose Station

5) Public Traffic (bus network) System In and Around Santa Cruz City

Bus network system is extremely developed in and around Santa Cruz City.

## **2.2 Present Conditions and Constraints in Production, Collection and Distribution of Fruits and Vegetables**

### **2.2.1 Production, Collection and Distribution of Fruits and Vegetables**

#### **(1) Crop Production in Santa Cruz Department**

Santa Cruz Department has been established as the supply base of farm products in Bolivia and majority of food crops have been produced in the department. Dominant crops produced in the department include maize, rice, wheat, cassava, soybeans, sugarcane, cotton and tomato. Production of maize, soybeans, rice and sugarcane are generally carried out in large scale in the low land areas, while, potatoes, vegetables and temperate fruits are mostly produced in small scale in the high land areas, the Valley areas (Table 2-4).

(2) Fruit and Vegetable Production in Santa Cruz Department

The Valley areas composed of Florida, Caballero and Vallegrande province, occupies only about 10% of the total cultivated land in the department. However, the irrigated areas in the region account for some 6,500ha or 70% of the department total (9,500ha), which means that substantially intensive irrigated farming is introduced in the region to overcome restricted rainfall distribution. The figures on the existing irrigation projects indicate that majority of the irrigation projects are small scale and an average irrigated area per beneficiary is limited at 1.6 ha. The irrigated areas in the Valley areas are intensively used for cultivation of potatoes and vegetables. In Santa Cruz Department the Valley areas can be clearly defined as the main supply basis of potatoes, tomato and temperate vegetables and fruits, major target commodities in wholesale marketing of fruit and vegetable products in the department (Figure 2-1, Tables 2-2, 2-3 & 2-7). While, production of citrus is extensively carried out and expanding in the lowland areas of Andres Ibanez, Ichilo and Warnes.

Due to the restriction of rainfall distribution, cultivation of vegetables are almost exclusively practiced under irrigation along rivers in the Valley areas. Potato cultivation is also almost exclusively carried out in irrigated areas in Florida and Caballero province, while in Vallegrande province the same is also practiced under rainfed conditions, especially in high altitude areas, in addition to irrigated areas. Production of fruits is done both under irrigated and rainfed conditions. In the lowland areas where having favorable rainfall distribution, temperate vegetable cultivation for domestic consumption is practiced usually in winter under rainfed conditions. However, the expansion of tomato and potato growing areas in Ichilo and Andres Ibanez is reported. In those areas, cultivation of such crops is done in cool winter season and major harvesting season is July to September for potatoes and June to November for tomato.

The estimated marketing volumes of the products are  $36.2 \times 10^3$ t,  $33.9 \times 10^3$ t and  $28.9 \times 10^3$ t, respectively for Florida, Caballero and Vallegrande provinces and  $99.0 \times 10^3$ t in the  $10^3$ t in the Valley areas as a whole as follows (also Table 2-5);

**Annual Marketing Volumes of Products in Valley Areas (1997)**

Commodity	Florida Province	Caballero Province	unit: ton	
			Vallegrande Province	Valley Areas
Potatoes	12,800	15,000	17,600	45,400
Vegetables	17,700	18,600	6,200	42,500
Fruits	5,700	300	5,100	11,100
Total	36,200	33,900	28,900	99,000

Remark: Rounded figures

Cropping seasons of cereals and beans in rainfed fields are in rainy season, generally from October/November to March/April. While those of potatoes and vegetables are diversified depending on the producing areas and year round production of vegetables is commonly carried out in Mairana, Pampa Grande and Saipina areas. The major producing areas can be categorized by production features into three as follows;

1) Mairana, Pampa Grande and San Isidro Areas

Primary crop is potato and cultivation of vegetables is diversified. Year round cultivation of vegetables is practiced.

2) Samaipata and Vallegrande Areas

Primary crop is potato followed by fruit production. Cropping seasons of potatoes and vegetables are basically fixed. Municipal government has strong intention to expand fruit production and production increase of the crop is expected.

3) Comarapa and Saipina Areas

Primary crop is potato followed by tomato. Year round cultivation of vegetables is practiced.

(3) Crop Production System

The crop production systems prevailing in the major producing areas are classified into 2 types; one is extensive cultivation of cereals and beans in rainfed areas and the other is intensive potato and vegetable production practiced in irrigated areas. The first system is the mainstay as a whole in the areas and the 2nd system is more or less limited to areas along major rivers having access to surface water resources. The production of potatoes and vegetables in the irrigated areas are mostly carried out by small scale farmers with some exceptional cases by medium scale farmers.

In the irrigated areas, land preparation is usually done mechanically, however, draft animal is partly employed for ridging for furrow irrigation. Other farming practices are carried out manually. Farming activities in the areas are usually done by employing farm labor forces from high altitude areas. Main farming activities performed by family labor include nursery preparation, chemical spray and irrigation. Weeding and harvesting is mostly depends on hired labors. Predominant irrigation method is furrow irrigation, while basin irrigation is common in vegetable nursery. Cultivation of diversified vegetables is commonly practiced and annual variation in crop selection is also usual in the irrigated areas.

(4) Destination Markets of Fruits and Vegetables from Valley Areas

Destination markets of the products differ among provinces depending partly on distance from possible markets and road conditions to the markets. The products in Florida and Vallegrande province are almost entirely shipped to Santa Cruz (Abasto Market) because it is the nearest wholesale market and due partly to poor road conditions to Cochabamba in case of Vallegrande province. While, the greater parts of products in Caballero province are shipped to Cochabamba. The destination markets of potatoes, vegetables and fruits produced in the Valley areas estimated based on the results of field surveys are presented in Table 2-8 and summarized below.

**Shares (%) by Destination Markets of Products from Valley Areas**

Destination Markets	Florida Province	Caballero Province	Vallegrande Province
Santa Cruz	90	43	95
Cochabamba	8	57	0
Local Market	2	0	5
Total	100	100	100

Remark: Products including potatoes, fruits & vegetables



- (5) Collection and Distribution of Fruits and Vegetables in Major Producing Areas  
 1) Commercialization of Fruits and Vegetables

Basically all fruits and vegetables(including potatoes) produced in the major producing areas except for limited volume for family consumption, for seed potato requirement and post harvest losses due mainly missing marketing timing are being marketed. On the basis of the findings of the field surveys, the results of previous studies by JICA master plan study, CORDECRUZ (Diagnostico de la Comercialization de la Provincia de Vallegrande, 1992) and FAO (Estudio de Comercialization para los Valles, Provincias de Vallegrande, Florida y Caballero, 1988) and the information presented in provincial PDMs, the current commercialization rates of the products are estimated as follows;

**Estimated Commercialization Rate (%) of Potatoes, Fruits and Vegetables**

Major Producing Areas	Potatoes	Tomato	Other Vegetables	Fruits
Samaipata, Mairana, Comarapa & Vallegrande areas	80 %	85 %	85 %	85 %
Pampa Grande, San Isidro & Saipina areas	90 %	85 %	85 %	85 %

Remark: Assuming seed potatoes procured for planting in P. Grande, San Isidro & Saipina

- 2) Marketing Volumes and Destination Markets

The estimated current marketing volumes of the products are as follows;

**Annual Marketing Volumes of Products in Major Producing Areas**

unit: t

Major Producing Areas	Potatoes	Vegetables	Fruits	Total
Samaipata	4,100	1,900	1,600	7,600
Mairana	1,300	4,100	2,100	7,500
Pampa Grande	3,200	9,300	1,100	13,600
Comarapa	2,600	2,300	300	5,200
San Isidro	5,400	8,500	-	13,900
Saipina	6,700	7,700	-	14,400
Vallegrande	7,900	1,700	3,000	12,600
<b>Total</b>	<b>31,200</b>	<b>35,500</b>	<b>8,100</b>	<b>74,800</b>

Remark: Rounded figures

The main destination of potatoes, vegetables and fruits produced in Samaipata, Mairana, Pampa Grande and Vallegrande areas is Abasto Market. While, the principal destination market of products in Saipina area is markets in Cochabamba and products in Comarapa and San Isidro areas are shipped both to Santa Cruz and Cochabamba market. The shares of destination markets by major producing areas are generalized in the following table.

**Destination Markets of Potatoes, Fruits and Vegetables**

Major Producing Areas	Santa Cruz	Cochabamba	Local Market
Samaipata, Mairana & Vallegrande area	> 90 %	limited	limited
Pampa Grande	80 %	< 20 %	limited
Comarapa & San Isidro	60 %	40 %	0 %
Saipina	20 %	80 %	0 %

### 3) Prevailing Collection and Distribution Systems

Collection and distribution (marketing) of potatoes, vegetables and fruits are mostly carried out by individual producers in Samaipata, Mairana, Pampa Grande, Comarapa and San Isidro areas and are usually directly sold to wholesaler (or sometimes to retailer) at destination markets. While in Saipina and Vallegrande area marketing of such products is mostly carried out by intermediaries.

### (6) Irrigation Development in Valley Areas

The irrigation projects that are on-going and under study in Santa Cruz Department have irrigation command areas of 9,000 ha in total. Among the areas, the command areas of the projects in the Valley areas account for 71% of the total or some 6,400 ha, consisting of rehabilitation areas of 3,500 ha and expansion area of 2,900 ha (Table 2-1). The implementation of the Comarapa-Saipina-San Rafael Irrigation Project is scheduled to commence in January 1999 under the financial support of KFW and can be categorized as an on-going project. Financial sources are being sought for other projects domestically and internationally and the implementation schedules of the projects are not certain yet.

The future development potential of potato and vegetable production in the major producing areas will largely depend on the expansion of irrigated areas as: 1) the crops are grown in irrigated areas except for Vallegrande area and 2) the rooms for productivity increase is rather limited because the intensive cultivation of the crops is already practiced and 3) the productivity increase through the improvement of farming practices will not be expected much under the present technical guidance system. On the other hand, there exist the development potential of temperate fruits through areal expansion and technology improvement in the areas, especially in Samaipata and Vallegrande area. However, the potential will be realized for the first time when the improvement of marketing conditions is achieved and the improvement of production technologies is promoted through technical guidance and support.

There exists one irrigation project in the major producing areas which could be categorized as an on-going project, the Comarapa-Saipina-San Rafael Irrigation Project. The project has the rehabilitation component covering the entire irrigation areas of Saipina area and part of those in Comarapa area and the component of development of new irrigation areas, expansion area, of 288 ha in Comarapa area and 302 ha in Saipina area, 590 ha in total. The project implementation is scheduled to be commenced from January 1999 and completed in 2000 in Comarapa area and in 2001 in Saipina area.

Other irrigation development projects in the major producing areas assessed technically and economically viable based on the feasibility or pre-feasibility studies are summarized in the following table (also Table 2-6).

**Irrigation Development under Study in Major Producing Areas**

Major Producing Area	Rehabilitation Area	Expansion Area	Total
Mairana area (1 project)	317	1,425	1,742
Comarapa area (1 project)	150	30	180
San Isidro area (1 project)	1,227	573	1,800
Vallegrande area (2 projects)	70	279	349
Total	1,764	2,307	4,071

## (7) Socio-economic Survey

The Socio-economic Survey was undertaken to generate baseline information on the socio-economic condition of the target beneficiaries in the Study area.

### 1) Profile of Household Members

The average number of members per household in the Study areas is 4.2 persons. Though the level of formal educational of respondent is rather low, literacy rate is relatively high.

### 2) Results of Farmers' Interview Survey

#### a) Economic Profile of Farmers

In average, the annual income per household is Bs.24,251 for small farmer, Bs.39,546 for middle farmer and Bs.69,280 for big farmer. Larger-scale farmers' income shows a tendency of having a bigger income from livestock sale compared to other groups.

Concerning family assets, 70-90% of the interviewed households own bicycle, radio, and television. The average ratio of electrification and water supply in the interviewed households is 70-80%. Expenditure on food items represents about 42% of the total living expenses.

**Income of Farmers in the Valley Areas (1998)**

Unit: Bs.1000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	avg.
Small-scale	12	23	26	20	25	24	40	24
Middle-scale	17	14	54	41	63	56	31	40
Large-scale	36	37	56	73	117	52	52	69
Average	22	24	40	54	59	32	32	42

Remarks:

1 "Socio-economic survey" (August 1998) for the Feasibility Study

2 (1)Mairana (2)Samaipata (3)Pampa Grande (4)Comarapa (5)San Isidro (6)Saipina (7)Vallegrande

3 Small-scale (<2.0ha) middle-scale (2.0-5.0ha) large-scale (>5.0ha)

4 Based on the data of ASOIFRUT on cropped irrigated areas of the Valley areas

#### b) Farmers' Intention on the Present Farming System

Through the inventory survey, it can be said that the farming practices in the Study Area are rather intensive using farm inputs such as fertilizers and agro-chemicals under irrigated conditions. However, cultivation is not much mechanized and depend largely on human labor.

The problems that farmers have been confronted are, a) expensive price of farm inputs, b) damages of pests and disease, c) low yield of crops, d) drought problem, e) lack of storage facilities, and f) marketing problems.

Concerning farmers' organization, about two thirds of interviewees knew the existence of farmers' organizations in their cantons and nearly half have participated in some organizations, that are for O&M of irrigation facilities, purchasing farm inputs or credit. On the other hand, two thirds were not aware of the existence of ASOIFRUT.

c) Crop Marketing

Farmers use "wholesalers" when referring to intermediaries. This is because wholesalers in Abasto Market never go to rural area to procure their products and many producers sell their products through their land owners.

Of the marketing problems, three serious problems are a) cheap price of products (96.4%), b) absence of farmers' organization (84.1%), and c) lack of market price information (63.0%).

(8) Major Agriculture Facilities

Major facilities include: 1) ASOHRUT collection facility in Samaipata area, 2) ASOHRUT building for small scale fruit processing in Samaipata area, 3) PETHOSAM collection facility in San Isidro area and 4) farmers market in Vallegrande area (Table 2-9).

The ASOHRUT collection facility was constructed by ASOHRUT under the financial support of CORDECRUZ in 1985, however, the facility has seldom utilized for the original purposes. Presently, the facility has been temporary used for storage of foodstuff under PAIS program. The building for fruit processing was constructed by CORDECRUZ/ ASOHRUT in 1994 and trial processing of fruit jam and marmalade was carried out for about 3 months under the guidance of a JOCV member in 1996. However, the commercial scale processing of fruits was not done because of failure in price competition with import commodities. Presently, the facility is left unused.

The PETHOSAM collection center was constructed by CORDECRUZ in 1983 for tomato ketchup production, however, without any operation of tomato processing the use of facility was entrusted to San Isidro sub-municipality in 1993 for the period of 5 years. The reasons for the failure are not clear, but failure to procure processing plant, price competition with import products and political issues could be enumerated.

The farmers market (consumer market) in Vallegrande area was constructed in 1993 by the assistance of FDC/CORDECRUZ and operation and management of the market is under the jurisdiction of municipal government. The market opens on Saturday and Sunday, where farm products are sold by retailers in the market which are directly delivered by producers. The idea to use the facility for collection of fruits and others as an initial stage of the introduction of improved collection and distribution system was not accepted by the municipal office and other related personnel including representatives of producers because the idea will bring about social conflicts with the current users of the market.

(9) Agriculture Research and Extension

1) Agriculture Research

The areas of research and technology transfer for crop, livestock and forestry in Santa Cruz Department are under the responsibility of the Tropical Agricultural Research Center (CIAT). Their mandates are to develop and validate appropriate technologies and improved practices of agriculture production system and to disseminate appropriate technologies and practices among farmers through organizations involved in agriculture extension and provision of technical assistance in rural areas. CIAT presently has about 100

technical staff, 2 Experimental Stations and 12 Regional Research Centers (RRC, small experimental stations) in the department, among which 4 Centers are established in the Valley areas; in Samaipata, Mairana, San Isidro and Vallegrande municipality.

To meet the said mandatory tasks, CIAT has three major action areas of research, dissemination and supply of technical and genetic resources. The major research fields of CIAT are applied and adaptive ones and carried out in the Experimental Stations and the Research Centers. In the areas of dissemination to promote farmers adaptation of the technologies generated by research, activities are supposed to be directed to three target groups of institutions working in rural development, extension workers and farmers. The supply of technical and genetic resources includes production of foundation seeds, preparation of certified seeds and publication of technical documents.

The main research activities of RRC on fruit and vegetable production in the Valley areas are: 1) soil management, 2) integrated pest management and variety selection and adaptability test. Primary target crops include potatoes, tomato, lettuce, green pepper and cauliflower for vegetable and peach, plum and citrus for fruit. The principal target crops and technical staffing in each Regional Research Centers are as follows;

**Principal Target Crops and Technical Staff in Regional Research Centers**

Research Center	Principal Target Crop	No. Technical Staff/Researcher(specialty)
Samaipata	fruits(plum, peach, citrus, wheat	1 (fruit)
Mairana	maize	3 (maize, vegetable & fruit)
San Isidro	vegetables & fruits	2 (vegetable & fruit)
Vallegrande	fruits	4 (fruit & vegetable, livestock, fishery & forestry)

Although the technical assistance in rural areas is one of the mandatory tasks of CIAT and the dissemination of improved farming technologies is one of the major action areas, technology transfer of CIAT is limited to extension. Personnel of non-governmental organization or producers associations and direct involvement of CIAT in extension services in rural areas is not presently realized mainly due to limitation in financial resources for the purposes, except for extension activities to fruit and vegetable growers implemented in the Valley areas in cooperation with ASOFRUT.

2) **Agriculture Extension**

In the Valley areas, the agreement between CIAT and ASOFRUT was made and technical staff in the Regional Research Centers are assigned to provide extension services to farmers. However, the provision of such services is presently limited because of financial constraints and limitation of manpower resources. In addition to the extension activities of CIAT/ ASOFRUT, such services are provided by extension personnel belonging to producers organization such as ASOFRUT and EMCA in the Valley areas.

In addition to the above extension services, some suppliers of farm inputs give technical guidance for the usage of chemicals, selection of varieties and etc.

However, the coverage of extension services in the Valley areas is limited and the strengthening of technical guidance or extension activities, especially on fruit production and chemical use, will be essential for the enhancement of vegetable and fruit production and the introduction of production planning in the Valley areas.

(10) Institution and Organization

1) Outline of Existing Institution and Organization

Under the present legislation system in Bolivia, there are two methods for establishing a farmers' organization. One is to establish in conformity with the law, the other is to establish voluntarily without any restrictions imposed by laws.

Furthermore, farmers' organizations with juridical status can be classified into three: a) cooperatives established in accordance with the Cooperative Law of 1958; b) juridical persons for public benefit (Public Service Corporation) established in accordance with Civil Law, and c) Farmers' Organizations (OTBs) organized in accordance with the Popular Participation Law of 1994.

In general, the organizations and cooperatives are characterized by their profit-seeking standpoint on a private basis in comparison with OTBs organized as a public organ. Public legal persons such as ASOFRUT may be intermediate between cooperatives and OTBs. In the agricultural sector in the Study Area, there exist all the above-mentioned types of organizations. Their outlines are described below.

a) Voluntary group/organization

There are about 35 existing irrigation schemes in the Study Area as of 1992. In each scheme, an irrigation water users' group (WUG) has been organized with an objective of the operation and maintenance of its irrigation scheme. WUG has its own by-law as private rules among the members. The existing WUGs are generally well-operated and managed.

b) Cooperatives

Although different from multi-functioning Japanese agricultural cooperatives, some cooperatives can be categorized as agricultural cooperatives (other types of cooperatives include livestock cooperatives; saving and credit cooperatives; cooperatives of public services; water supply cooperatives).

As for the agricultural and livestock cooperatives may be equipped with the function of collaborative production. However, with the exception of CAICO in Okinawa and CAISY in San Juan, none work on marketing or credit schemes.

c) Public Services Corporation

ASOFRUT, EMCA and CAPA, and Farmers' Syndicates represent public services corporations in the agricultural sector.

While ASOFRUT covers the whole Santa Cruz Department, EMCA and CAPA covers only Comarapa municipality and Vallegrande province,

respectively. Farmers' Syndicates have been organized in each existing community of Florida and Caballero provinces, while in Vallegrande province, it is planned to establish one in 1999.

Of these farmers organizations, ASOHRUT, EMCA and CAPA have the intention to conduct agricultural marketing activities. However, these organizations have no experience in marketing activities because the members had no intention of changing their individual sales practice.

d) Basic Territorial Organization (OTB)

After the promulgation of the Popular Participation Law of No. 1551, 1994, Bolivian social and administrative situations have essentially been changed. Under this law, organized people can directly participate in their own municipal development with a good control over the economic resources of each Municipal Government.

OTB is defined as a basic unit of community for popular participation. OTBs are recognized as juridical personality through the required legal procedure of registration. All the urban and rural population in a determined territory have the right to establish an OTB. Only one OTB is allowed in one community.

2) Cooperative Use of the Existing Collection Centers by Farmers

While ASOHRUT once constructed collection centers in Samaipata and El Torno, the facilities have never been used as collection centers and now converted to rental warehouses. Similarly, both EMCA and CAPA have never implemented agricultural marketing activities for the members preferred to sell their products individually. The following reasons can be assumed.

- The farmers were so far rather averse to cooperative shipping and selling. In fact, the seed-time of tomato varies considerably from farmer to farmer in the irrigated area, due to some competition among these vegetable growing farmers.
- Farmers as well as municipal governments concerned hope to establish air-conditioned storage house in order to prevent price drop.
- While the Valley areas are major producing area of fruits and vegetables with climatic advantage, except a few temperate fruits, they are also cultivated in the lowland areas of Santa Cruz Department.
- Farmers are not always satisfied with the present marketing system (only one third were satisfied in the interview). However, the discontent seems more to do with low prices and opacities in dealings. Furthermore, no one has ever taken a progressive action for possible solution with others.

At present, small farmers without their own means of transportation, shipping is a limiting factor in marketing. Therefore, apart from selling their products at the field, they conduct collaborative transportation with a few other producers. In Vallegrande, there is an active movement to organize a new farmers' organization for cooperative shipping as well as sorting and packaging.

Farmers are positive for using shipping facilities while negative yet for cooperative selling.

(11) Finance and Credit

- 1) Credit system: In the Valley areas, some informal credit systems are found between producers and agricultural input dealers though not very common. As for formal credit systems, there are credit schemes funded by foreign aid. Though institutionally the farmers have access to these schemes according to their operation scale, its principal function is to subsidize farmers' own fund, and there is still a need for establishing a funding system with farmers' initiative.
- 2) Local governments' budget: Both the Prefecture of Santa Cruz and the Municipal of Santa Cruz have not only operational fund but a budget for development investment, which can be appropriated as the source for investment and operation of the project. Other municipals do not have as sufficient a budget, and it will be necessary to accrue OTB fund based on farmers' own fund and the above credit systems.

**2.2.2 Constraints in Production and Marketing of Fruits and Vegetables**

(1) Valley Areas

The development of production technology, including irrigation facilities, in this area has mostly been done by the producers' initiative, rather than through public support. This, however, has caused latency in updating irrigation and production technologies, inadequate system of planned production, and absence of collaborative marketing system/ organization/ institution of fruits and vegetables. As a consequence, the Valley areas retain low productivity with the provision capacity to the consumption areas declining in relation to the growing volume of inflow from lowlands as well as outside the Department, and of imports.

(2) Lowland Areas

Large-scale farmers tend to be focusing on diversifying their cultivation as the impact of MERCOSUR is becoming articulated. As part of this trend, fruit and vegetable production including potatoes and citrus fruits, and new collection and distribution system is being developed. In particular, an increasing volume of citrus fruit products from lowlands is brought into markets, Abasto market being one of them.

**2.2.3. Development Needs in Production and Marketing of Fruits and Vegetable**

(1) Valley Areas

The major producing areas of fruits and vegetables in the Valley areas is located in temperate to subtropical climatic conditions which are availing production of variety of temperate fruits. The Valley areas also have irrigation systems which are availing the cultivation of temperate vegetables throughout the year. Accordingly, it is assessed that the areas have potential to be developed as the supply base of temperate vegetables (including potatoes) and fruits to the expanding Santa Cruz metropolitan and other markets. To establish such a supply base in the Valley areas, promotion of crop production is achieved through: 1) the improvement of production system and technology, 2) the introduction of crop production planning in all the major producing



areas for adjusting to seasonal market demand and production trends of other competitive producing areas, especially in the low land areas and 3) the improvement of the present marketing system and the introduction of adequate cooperative marketing system by establishing products Collection and Distribution Centers.

By assessing the said constraints for production and marketing of fruits and vegetables, the potential for development as the supply base of the crops and the intentions of farmers and municipal governments, the needs for the improvement of production and marketing system and the establishment of products Collection and Distribution Centers in the major producing areas are identified as follows;

- Development of Collection and Distribution Centers in all the major producing areas and introduction of cooperative marketing system for establishment of improved marketing system and promotion of crop sector development,
- Establishment of the center from the initial stage as a central place for providing technical and institutional guidance to farmers and establishment of the center as a nuclear for promotion of crop sector development in the areas, and
- To envisage the introduction of integrated production planning and marketing system in the whole Valley areas so as to establish the region as the supply base of temperate vegetables and fruits to Santa Cruz and even in the country.

## (2) Lowland Areas

Unlike the Valley areas, the lowlands are the center of large farming operations aimed at cultivating product for export. Of the product cultivated, vegetables are mainly produced by self-sufficient farmers. Product transported to the market are mainly bananas and citrus fruits. The interest of large farms in domestic product marketing has been nominal and therefore, they have not participated actively in improving the product marketing system. A characteristic of this region is that product cultivation is not overly developed. However, with Bolivia's participation in MERCOSUR and the diversity of crop production, the large farming operations in the lowlands have begun to recognize the importance of rationalizing the market and have started to implement organizational reforms and rationalization of the marketing process centered on agricultural cooperatives as a part of an effort to create a product production area.

For example, the Japanese community area of San Juan has begun plans to expand into large-scale fruit production and has created a new fruit production marketing section within its agricultural cooperative. This cooperative is planning to introduce a sorting system for fruits, but the organization itself lacks experience in product marketing and reforms of the marketing system, in conjunction with improved and expanded production system, are urgently needed. As part of this strategy, the cooperative plans to engage directly in wholesale activities in order to alleviate exploitation by intermediaries if a New Wholesale Market is created in Santa Cruz city.

Potato growers are presently shipping their product to Cochabamba. The underlying reasons are lowered wholesale functions due to the overcrowded conditions at the existing Abasto Market and the difficulty in utilizing market facilities. They are greatly interested in the opportunities that will be available when the New Wholesale Market is created.