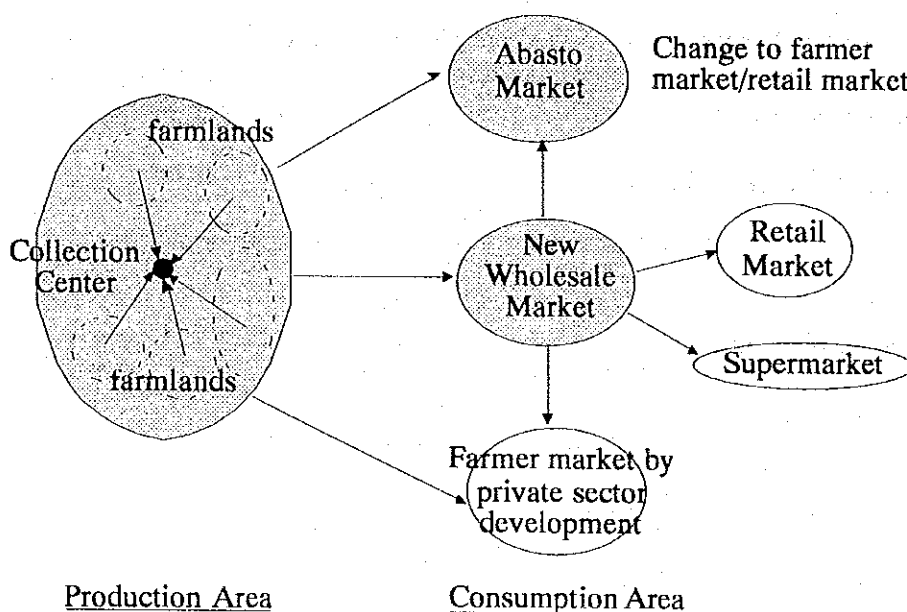


3 PROJECT EVALUATION

The evaluation of the project which comprised the integrated marketing network system, will consider the 3 project scenarios based on the existing situation without the project both in the production area and consumption area.

Case	Without Collection Center	With Collection Center
Without Wholesale Market	Base (Existing trend)	Scenario I
With Wholesale Market	Scenario II	Scenario III

Project: Integrated Market Network System



Remark: The shaded areas in the figure represent the Project's components.

Project feasibility is examined according to the above 3 scenarios through economic and financial analyses. In economic evaluation, viability is evaluated from the point of view of value added to national economy arising from the Project. In financial evaluation, it was examined whether the management body of each scenario is capable of financially sound management.

The Economic Internal Rate of Return (EIRR) was used as the measure for project economic evaluation, whereas the Financial Internal Rate of Return (FIRR) was used as the measure for project financial evaluation.

3.1 Assumptions for Calculation

(1) Physical Life of the Project

The physical life of the project components is shown in Table A.5.3-1.

The physical life of the project components is shown in Table A.5.3-1. Straight line depreciation has been assumed with zero salvage value at the end. The investment cost used to calculate the depreciation and maintenance cost was assumed to be 65% of the original investment cost to convert the international unit cost to local unit cost.

(2) Prices and Foreign Exchange Rate

All cost and prices are based on constant price of 1998. Foreign exchange rates for November 1998 of Bs5.62 to a US dollar was used.

(3) Income Tax

Tax is excluded from all items.

(4) Interest Payment

The investment cost is assumed to be at no interest.

(5) Training and Technical Assistance Cost

The cost for training and technical assistance is to be borne by the government and not included in the financial evaluation which was prepared from the viewpoint of the management body of the C/D centers and NWM facilities.

3.2 Economic Evaluation of Scenario I

If the Collection and Distribution centers were implemented without the NWM, the economic benefits of the centers will be slightly reduced as the commercialization and marketing advantage of the NWM will not be realized. The absence of the NWM is estimated to reduce the commercialization benefit by 50%.

3.2.1 Economic Cost of Scenario I

The economic analysis will use economic / social cost obtained by multiplying the financial cost / market prices with the conversion ratios provided by Vice-Ministry of Public Investment and External Finance under the Ministry of Housing listed below. These ratios must be applied to all public sector projects to evaluate their socio-economic performance.

Ratios of Price Adjustment for Socio-Economic Evaluation of Investment Projects

	<u>Item</u>	<u>Conversion Ratio</u>
1.	Foreign exchange premium	1.16
2.	Urban Labour	0.23
3.	Rural Labour	0.64
4.	Semi-skilled Labour	0.43
5.	Skilled Labour	0.44
6.	Foreign Labour	0.99
7.	Social Discount Rate	12.07%

The economic cost of the project component after applying the appropriate conversion ratio is shown in Table A.5.3-2 ~ 5.3-8.

3.2.2 Results of Economic Evaluation of Scenario I

(1) Economic Internal Rate of Return (EIRR)

The EIRR obtained was 9.7% (see Table A.5.3-9). For the initial 9 years, the net benefit is negative until benefits from increased commercialization rate and production begin to offset the cost.

(2) Sensitivity Analysis

Sensitivity analysis for the project was carried out to evaluate the extent of changes in the EIRR if key factors change within a reasonable range. The key factors, their percentage changes (see Table A.5.3-10) and the results are shown below.

Case	Investment Cost	Revenue	EIRR
Base case	no change	no change	9.7%
Case 1	+ 10%	± 0%	9.0%
Case 2	± 0%	+ 10%	11.7%
Case 3	- 10%	± 0%	10.4%
Case 4	± 0%	- 10%	7.4%

The best case (Case 2) gave an EIRR of 11.7% and the worst case (Case 4) gave an EIRR of 7.4%. The change in benefit of ±10% can be considered as changes in prices of the products or as changes in the volume of production / commercialization. Any delay in the realization of production increase (due to bad weather, delay in extension service, technology transfer, etc.) will further reduce the EIRR.

(3) Benefits Distribution

The economic benefits of production increase will be enjoyed by the producers at the 6th year of operation of the C/D centers. The economic benefits of commercialization increase will be realized from the 5th year of operation. In 2010, economic benefits from production and commercialization increase will be US\$1,623,559 and US\$234,645 respectively. 100% of these benefits accrue to the producers.

3.3 Financial Evaluation of Scenario I

The financial evaluation of Scenario I is to study and appraise the financial feasibility of the Collection and Distribution centers without the NWM. The financial evaluation took account of the financial cost and revenue to derive the income statement table. The Financial Internal Rate of Return (FIRR) was then calculated to show the financial viability of the project.

3.3.1 Financial Cost of Scenario I

(1) Investment Cost

The investment cost and its detail components are shown in Table A.5.3-2~8.

(2) Operation Cost

The annual operation costs of the Collection and Distribution centers are shown in Table

A.5.3-11 for the income statement and cash flow for all 7 Collection and Distribution centers.

3.3.2 Revenue of Scenario I

The revenue of the Collection and Distribution centers will be from the user fee charged to the users (see Table A.5.3-11).

3.3.3 Results of Financial Evaluation of Scenario I

(1) Financial Internal Rate of Return (FIRR)

If the project in this scenario is financed with own equity and loan, the FIRR obtained would be -2.2% (see Table A.5.3-12). The revenue from the user fees will offset the cost after 5 years of operation.

(2) Sensitivity Analysis

The key factors, their percentage changes and the results (see Table A.5.3-13) are shown below.

Case	Investment Cost	Revenue	FIRR
Base case	no change	no change	-2.2%
Case 1	+ 10%	± 0%	-3.1%
Case 2	± 0%	+ 10%	-1.2%
Case 3	- 10%	± 0%	-1.2%
Case 4	± 0%	- 10%	-3.2%

3.4 Economic Evaluation of Scenario II

3.4.1 Economic Cost of Scenario II

The economic cost of the project component of Scenario II after applying the appropriate conversion ratio is shown in Table A.5.3-15.

3.4.2 Results of Economic Evaluation of Scenario II

(1) Economic Internal Rate of Return (EIRR)

The EIRR obtained was 11.8% (see Table A.5.3-14) based on the benefit items of city entry time restriction, space restriction at Abasto Market, selling from trucks, and consumer time saving. The economic cost of investment includes the Bolivian side obligation for land preparation and infrastructure extension, construction cost of the NWM and equipment supply.

(2) Sensitivity Analysis

The key factors and their percentages were considered and the results (see Table A.5.3-16) are shown below.

Case	Investment Cost	Benefit	EIRR
Base case	no change	no change	11.8%
Case 1	+ 10%	± 0%	10.5%
Case 2	± 0%	+ 10%	13.4%
Case 3	- 10%	± 0%	13.5%
Case 4	± 0%	- 10%	10.2%

The changes of the key factors in the 4 cases above showed that the EIRR in the worst case is 10.2% and in the best case is 13.5%. The NWM is thus economically feasible and justifiable, especially in the event the investment cost is reduced or when benefits are increased. A 10% increase or decrease of investment / benefit changes the EIRR about the same percentage.

(3) Benefits Distribution

The economic benefits of the NWM will be from; i) opportunity time cost saving of the producer/intermediary and transporter from city entry time restriction, ii) opportunity time cost saving of the producer/intermediary and transporter from space restriction inside Abasto Market, iii) opportunity time cost saving of the producer/intermediary, wholesaler and transporter from selling from truck outside Abasto Market, and iv) opportunity time cost saving of the consumer visiting Abasto Market. In 2010, economic benefits from these items for producer/intermediary, transporter, wholesaler and consumer will be US\$426,101, US\$1,462,931, US\$195,687, and US\$240,383 respectively. Expressed in percentage, about 18% of economic benefits accrue to producers/ intermediaries, 63% to transporters, 9% to wholesalers, and 10% to consumers. Other benefits to that were not accounted for in the above benefit calculations are; 1) wholesalers' time savings from more efficient marketing and movement of products. This time savings may be used by the wholesalers for other income generating activities thus increasing their income, 2) opportunity for new wholesalers to participate, not only those transferred from Abasto Market, 3) Indirect benefit to retailers will be more retailing space/ activities at Abasto Market after wholesale function removed to NWM.

3.5 Financial Evaluation of Scenario II

3.5.1 Financial Cost of Scenario II

(1) Investment Cost

The investment cost and its detail components are shown in Table A.5.3-14.

(2) Operation Cost

The annual operation costs are shown in Table A.5.3-17. The annual personnel cost are estimated based on the number of personnel proposed for the organization structure. Personnel cost, number of staff members and their status, together with the electricity, water, and tel/fax charges to operate the NWM.

3.5.2 Revenue of Scenario II

It is assumed that the NWM is operated in its entirety by one enterprise. All the revenue generated from the NWM's activities therefore accrue to this enterprise. Revenue will be

from the income wholesale activities and entering truck charge. Net income from wholesale is sales amount minus purchasing fee and other cost items (such as labor, packing, fixed cost assuming that the wholesalers are salaried employees). The net income from the wholesale activities is expected to be US\$1,574,000 in 2005, and US\$1,890,000 in 2010 (refer to Table A.2.4-26 in Annex 2).

Truck entering the NWM will be charged according to their tonnage. The charge will be Bs.10 for 20 t truck, Bs.5 for 10 t truck, Bs.3 for 5 t truck, and Bs.1 for jeeps. Income from this charge will be US\$24,815 in 2005, and US\$30,198 in 2010 based on projected truck numbers into the NWM. Please refer to Table Table A.5.3-18 for income statement and cash flow.

Results of Financial Evaluation of Scenario II

(1) Financial Internal Rate of Return (FIRR)

If the project in this scenario is financed with own equity and loan, the FIRR obtained would be 7.7% (see Table A.5.3-19) without taking account of the Bolivian side investment for land preparation and infrastructure extension. The construction of the project is assumed to be in 2 phases over a span of 2 years.

(2) Sensitivity Analysis

The key factors, their percentage changes and the results (see Table A.5.3-20) are shown below.

Case	Investment Cost	Revenue	FIRR
Base case	no change	no change	7.7%
Case 1	+ 10%	± 0%	6.6%
Case 2	± 0%	+ 10%	8.9%
Case 3	- 10%	± 0%	9.0%
Case 4	± 0%	- 10%	6.5%

The analysis shows that in the best scenario case, the FIRR is 9%.

3.6 Economic Evaluation of Scenario III

Scenario III covers the case of implementing the Collection and Distribution centers in conjunction with implementing the New Wholesale Market.

3.6.1 Economic Cost of Scenario III

The economic cost of Scenario III is the sum of the economic cost of Scenario I and II (Table A.5.3-2 ~ 5.3-8, and 5.3-14).

3.6.2 Results of Economic Evaluation of Scenario III

(1) Economic Internal Rate of Return (EIRR)

The EIRR for 7 Collection and Distribution centers and the NWM taken together was 12.6% (see Table A.5.3-21).

(2) Sensitivity Analysis

The key factors, their percentage changes and the results (see Table A.5.3-22) are shown below.

Case	Investment Cost	Benefit	EIRR
Base case	no change	no change	12.6%
Case 1	+ 10%	± 0%	11.0%
Case 2	± 0%	+ 10%	14.2%
Case 3	- 10%	± 0%	14.4%
Case 4	± 0%	- 10%	10.9%

The best case (Case 2) gave an EIRR of 14.4% and the worst case (Case 4) gave an EIRR of 10.9%.

3.7 Financial Evaluation of Scenario III

3.7.1 Financial Cost of Scenario III

(1) Investment Cost

The investment cost and its detail components are shown in Tables A.5.3-2 ~ 5.3-8, and 5.3-14).

(2) Operation Cost

The annual operation costs and income statement for all of the Collection and Distribution centers and NWM are shown in Table A.5.3-23.

3.7.2 Revenue of Scenario III

The revenue of the Collection and Distribution centers and NWM will be from the user fee charged to the users of the C/D centers, truck charge, and net income of the wholesalers (see Table A.5.3-23).

3.7.3 Results of Financial Evaluation of Scenario III

(1) Financial Internal Rate of Return (FIRR)

If the project in this scenario is financed with own equity and loan, the FIRR obtained would be 6.6% (see Table A.5.3-24).

(2) Sensitivity Analysis

The key factors, their percentage changes and the results (see Table A.5.3-25) are shown below.

Case	Investment Cost	Revenue	FIRR
Base case	no change	no change	6.5%
Case 1	+ 10%	± 0%	5.5%
Case 2	± 0%	+ 10%	7.7%
Case 3	- 10%	± 0%	7.8%
Case 4	± 0%	- 10%	5.4%

3.8 Conditions for Self-financing Operation & Management

3.8.1 C/D Centers Operation

From the result of the financial evaluation of Scenario I (see Table 12-4), the net income is negative for the first 7 years of operation if depreciation is included. If the depreciation is excluded, the net income flow will be positive after the first 4 years. As such, for self-financing operation of the C/D centers, the management bodies will need to procure funds to cover the initial short-fall of income. The loan amount for each of the center is small (from US\$10,000 to US\$50,000) and the expected revenue from user fee will be able to cover the loan repayment without any problems.

3.8.2 Development, Management and Operation of a Privatized Wholesaler Section

This additional option assumes that the basic infrastructure and facilities of the NWM are built and operated by the government / public body; the private sector will build and operate the wholesalers' section.

It is assumed that the cost of construction of the wholesalers' section (Market Hall No.1) in this option will be half of that estimated by the Study, i.e. US\$2.7m as local contractors will be employed for the construction based on local standards. Consequently, the depreciation and maintenance cost of the facility will be reduced accordingly. However, the personnel cost to operate the wholesalers' section will remain the same.

In this option, the private developers will either rent out the market hall lots or sell them. In either case, it is envisaged that the tenants will have to pay for the use of the water, electricity, telephone, etc.

In the case of rental of market lots (assume 188 lots available), for the private wholesalers' section to be financially viable, it is estimated that the tenants will have to pay about Bs.50 per day as rental charges. This charge is double that in the case of operation by the Management Body / public sector in Scenario II. Trucks entering will also have to pay double the amount of charge. This revenue assumption will then give an FIRR of over 15.4% (see Table A.5.3-26) which will then make it feasible for the private developer to borrow from the banks to finance the construction and operation of the private market hall.

In the case of sale of market lots, revenue from this sale will need to cover the construction cost. The lots will have to be sold at US\$14,500 per lot just to cover the construction cost without making a profit. In addition, the owners of the lots will have to pay additional charges to the private management body to cover operation, management, depreciation and loan repayment expenses. These additional charges total about US\$800,000 per year or US\$4,000 per lot per year.

In both the above cases (rental or sale), privatizing the wholesalers' section will make the rest of the NWM financially unviable as the revenue from the rental charges of the wholesalers' section will be forgone to the private developer. Only revenue from incoming truck charge, which is only about 10% compared to the revenue from the rental charges of the wholesalers' section, will accrue to the NWM public sector management body. This revenue alone will not be sufficient to meet the operation / management cash flow of the NWM, therefore yearly operation subsidy from the government will be

required.

3.9 Overall Evaluation

An evaluation of three possible scenarios for the Project have been prepared -- a project limited to establishing the Collection and Distribution Centers, a project limited to establishing a NWM, and a project concerned with establishing Collection and Distribution centers and a NWM.

- a) 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 NWM, and 12.6 percent for a project concerned with establishing both Collection and Distribution Centers and a NWM. According to the results of a sensitivity analysis, a 10% increase or decrease of investment / benefits changes the EIRR about the same percentage.
- b) Financial evaluation: In the case of a project limited to establishing solely Collection and Distribution Centers, the FIRR is -2.2 percent, 7.7 percent for a project limited to constructing a NWM, and 6.6 percent for a project concerned with establishing both Collection and Distribution Centers and a NWM.

If the NWM is to be privatized, the following two scenario cases are presented below.

- Private sector participation from the initial start of the Project: The wholesalers' section 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' section are then sold to users. It will be necessary to introduce a system of subsidies to cover a portion of the construction costs, in order to enable users to make a profit. In this case, all other publicly owned facilities within the NWM will be constructed and operated by the municipal government. However, revenue generated by the wholesalers' section operations will go to the private sector and only entrance fees collected from trucks (which are nominal) will accrue to the public sector. As a result, the municipal government will be responsible for raising the 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.
- c) 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 NWM are some of the anticipated additional indirect benefits.

4 FUND ARRANGEMENT

4.1 Construction Fund

4.1.1 New Wholesale Market

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

- 1) 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
- 2) 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.

On above fund arrangement, plan formulation, budget allocation, and budget implementation procedure to be undertaken by each agency were confirmed.

Privatized wholesalers' section

As noted in the financial analysis, a financially viable privatized wholesalers' section would be difficult to implement as the rental charges or sale prices of the market lots that will need to be imposed are exorbitant by present standard. Also, operation of the rest of the NWM will be difficult without the revenue from the rental of the wholesalers' section.

Privatizing option of the wholesalers' section will require subsidy from the government to assist the wholesalers to offset the high rental and / or sale price. Also, subsidy will be required for the operation / management expenses of the NWM.

4.1.2 Collection & Distribution Center

Construction funds for the Collection and Distribution Center is envisaged to come from FDC or foreign donor. In the case of funds from FDC, FDC will fund 85%, Municipal should provide 10%, and the beneficiary community should provide 5% either in funds or labour / material. If the beneficiary community is not able to cover this 5% of their fund obligation, the Municipal will have to assume responsibility of this 5%.

4.2 Management / Operation Fund

4.2.1 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) Subsidies of the Prefecture and Municipal are requisite for the training/technical assistance cost.
- 3) The cost of facility operation other than mentioned in 1) and 2) is basically users' responsibility, though appropriate favourable 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.).

4.2.2 NWM

The Prefecture and Municipal will be responsible for the initial start-up operating funds whereas the Management Body is to procure funds for operation while receiving the above mentioned favorable treatment, under the supervision of the NWM Management Committee. Personnel costs, facility maintenance costs and depreciation cost will be covered by the management body utilizing fees collected from market users.

In all four PCM workshops (1 with producers, 2 with wholesalers and 1 with female traders), it was pointed out that the utmost issue in the project management is skepticism against intervention by the Management Committee, operation body and public agencies. Participants agreed to pay the fee once such distrust is overcome.

For the sound and reliable procurement of operation fund and management of the NWM, transparency and accountability of financial system (regular report to the Management Committee and disclosure to users) is requisite.

Instead of the present system of incorporating operational fund accrued from users into the Prefecture and Municipal budget, a system to feed it back to the project operation fund needs to be established.

Eventually, users' associations are to be unified into one "wholesale enterprise" in the course of privatization. That taken into consideration, the suggested financing system of the operational body has to be established shortly.

4.2.3 C/D Centers

The operation of all the C/D Centers in the initial years will suffer deficits in "Users fees collected from users- Operation Costs" due to the limitation of the collection volumes in the years (Annex 1 5.3.2 and Table A.1.5-9). The municipal governments who are the responsible agency for the operation of the centers will have to supply loan to the centers to cover the operation deficits in the initial years from own financial resources or by obtaining low cost external funds. The C/D Centers are to repay the debts when they generate enough surplus from the operation as shown in Table A.1.5-9. With such support, the management body of the center will establish the operation and financial system soundly managed with the users fees collected from users of the center.

4.3 Financial Organization and Credit System

4.3.1 FINDESA S.A.M. (Financiera de Desarrollo de Santa Cruz Sociedad Anónima Mixta)

FINDESA was formed in 1986 by CORDECRUZ, CAO and CAINCO (Cámara de

Industria y Comercio de Santa Cruz). Their source of finance comprise 74.76% from the Prefecture of Santa Cruz Department, 24.07% from Central Bank of Bolivia ("Banco Central de Bolivia"), and 1.17% from other sources.

Their founding principles are:

- Promote the social & economic development of the region in the form of sustainable increase in the production and in the level of employment.
- Participate in the financing of investment for basic social and economic physical infrastructure.
- Develop, promote and equip industries, craft enterprises, services, agricultural activities, agroindustry and mining.
- Reorganise, rationalise and transform enterprises in the region.

Their investment at the end of 1997 were, 31.8% in agriculture sector, 28.2% in housing, 13.55% in cattle, 9.83% in industry, 11.82% in livestock, and 4.79% in others (bird, bee, pork, craft, & tourism).

They also act as a leader bank that serves to channel funds and collaborate with other financial institutions through Institute of Credit Intermediaries (ICI).

They support the productive sector by financing small and large producer, especially helping small producers that do not have access to commercial private banks.

For working capital, the loan period is 2 ~ 3 years at 16% interest per annum, generally with 1 year grace period. For investment capital, the loan period is 3 ~ 7 years at 16% interest per annum, generally with 1 year grace period. The loan amount is not greater than US\$50,000. The collateral / guarantee for the loan is the land / house (farm machineries are not acceptable). The value of the guarantee must be 3 times the value of the loan amount.

FINDESA is to be privatised. Their initial privatisation bidding in 15 Jan 1997 did not succeed. A new bid condition was proposed in 4 Feb 1997 to allow group of enterprises, private enterprises and national financial institutions, foreigners to participate in the bid. The Board of Directors of FINDESA in 17 Nov 1997, directed that the privatisation process be accomplished as soon as possible.

4.3.2 FDC (Fondo de Desarrollo Campesino)

FDC gets its funds from World Bank, KFW, IBD, Japan and Belgium. A small proportion of the funds is in a form of donation whereas the majority is loan. The Japanese donation is in the form of fertilisers. There are FDC offices in each of the Department and they compete for the funds which are allocated in La Paz.

The beneficiaries of FDC are in the rural areas defined as municipalities with fewer than 5,000 inhabitants. The project to be financed has to show social impact benefits, economic viability and environmental sustainability.

The FDC finance is in a form of aid with no need for repayment. The promoting institution (eg. municipality, NGOs, associations) is expected to fund about 5 ~ 40% of the project cost. The percentage depends on 3 factors, i.e.:

- economic capability of the municipality.

- amount of credit requested (a higher amount will mean a lower percentage).
- social & economic benefits of project (greater benefits coupled with low economic capability of municipality will mean lower percentage).

The beneficiary community is to bear about 5 ~ 25% of the project cost. This can be in the form of money, labour, and / or material. Generally, the percentage is low if the project has social and economic benefits.

FDC funds are used for construction of basic infrastructure such as roads, bridges, community centers, collection centers, protective structures, dams, conservation and productive structures, technical assistance, community processing production, institutional building, pre-investment studies, etc. The fund cannot be used to buy machinery or equipment.

FDC projects could be classified into 3 types;

- Individual small projects costing US\$30,000 ~ US\$100,000 / project
- Projects within a Program. The funding for the program could be up to US\$2 million. The program must be a component of the Municipal Development Plan or Master Plan and the prioritized projects are an integral part of the plan.
- Special Projects costing more than US\$350,000 and up to US\$5 million which are executed over 1 ~ 5 years. This will require a separate organization and cooperation with international funding.

The approval process of the credit application is generally takes between 10 ~ 12 days. After approval FDC will put together the tender documents for public tendering. The tenders will be evaluated by an Evaluation Committee comprising the Mayor of the municipality, Municipality Council, technical personnel, other relevant staff and FDC personnel. Once the contractor is approved, 2 contracts will be signed. One contract will be between FDC and the municipality, the other will be between the municipality and the contractor.

4.3.3 Cooperativa De Ahorro Y Credito "La Merced" Ltda

This Saving & Credit Cooperative has 15 agencies in 12 provinces of Santa Cruz Department. They have about 11,000 members in the rural areas and about 15,000 members in the urban areas. Membership fee is Bs70/year.

They had a loan from BID of US\$500,000 with an interest of 1% for a period of 40 years with 10 years grace period. Other than this, they have their own financial resources from members' fee and savings. Their total capital is about US\$5 million.

They give credit to the small-medium producers in agriculture sector (about 50% of their investment), commerce, housing, and micro-enterprises.

Their loan amount is normally between US\$100 ~ US\$3,000. For small amounts, the loan period is about 6 ~ 8 months with more than 20% interest per annum and only 1 repayment at the end of the loan period. For the larger amount, the loan period is up to 3 years with 20% interest per annum, no grace period with 6 months or 3 months or monthly repayments.

The guarantee for the loan is land / house and one other person as guarantor. Borrowers

must be members of the cooperative.

4.3.4 BOLINVEST

BOLINVEST was formed in 1989 in La Paz, and 1991 in Santa Cruz, as a private non-profit organization with funding from USAID and contribution from other organizations/individual. It has offices in La Paz, Cochabamba, and international offices in Holland, Peru, Argentina, and Colombia. Around US\$17m has been invested from 1989 to 1997 by BOLINVEST. Their objective is to promote commercialization / export of Bolivia products and promote foreign investment.

(1) Extension to Producers

They are working with producers to improve their production volume by providing technical assistance at all stages of production (land preparation, planting, products assistance, planning of work, and evaluation and monitoring). They want to improve the production volume and quality for commercializing. They also act as technical "guarantor" for loans application by producers.

(2) Processing (semi-processing)

They are also looking at promoting processing (semi-processing) of agriculture products for export. Their 3 big plans are to set up processing plants (of scale less than US\$100,000) in Yapacani, Samaipata and San Julian. BOLINVEST has cooperated with CIRAD (French development of Agriculture), JICA for the promotion of these projects. Their goal is to setup these processing plants in order to assure a demand for the agriculture products at the production area so that the farmers do not need to transport their produce to the consumption area to sell. These plants will involve the Municipal governments, NGOs, CIRAD (French) with BOLINVEST providing the technical assistance.

(3) Foreign Investment

BOLINVEST promotes foreign investment in Bolivia by providing information/ technical & financial evaluation / advice to foreign investors. Problems for foreign investors are low productivity per ha (competitive if productivity is around 100t/ha of tomato), high cost of transportation to export, and undeveloped market in Bolivia.

4.3.5 FONDECO

FONDECO is a private non-profit association. It receives contributions and loans from Holland, Germany, Spain and EU. It was established in 1991 as a specialized credit unit under Center for Research and Promotion of Peasant Population (CIPCA) to manage its revolving loan fund. However in 1995, it became an independent non-bank financial institution based in the city of Santa Cruz de la Sierra.

It has offices in 18 municipalities. In Santa Cruz Department, it operates in 8 municipalities in the lowland areas. Its clients are small farmers, rural entrepreneurs and small traders of various ethnic groups who do not have access to formal financial systems. Nearly 50% of its clients are female in the rural areas involved in small scale trading, cattle, pork, poultry breeding, and dairy products. Presently, FONDECO does not operate in the valley areas.

Its loan amount is normally less than US\$1,200 as more than 50% of its clients are small scale female traders. In principle there is no loan limit and loans greater than US\$70,000 for machinery have been made. As guarantee for the loan, FONDECO requires that the title for the land be deposited with them, an application form for the loan to be filled in, and/or a credit solidarity group be formed to guarantee the loan on a collective basis.

4.3.6 ASOFRUT

Their loan amount normally varies from US\$300 ~ US\$1,000/ha. Lending is normally to a group (comunado) with loan guarantee of house or land titles. In the case of lending to an individual, it is required that another person act as guarantor. Their credit is for production, planting, and plant production. As such the loan period is normally for 6 ~ 8 months to be repaid at the end of the loan period when the product is sold. Their interest rate is 12% per year. At the moment, they have roughly about 1,000 farmers taking loan.

4.3.7 Agriculture Credit in the Valley Areas

Agriculture credit services available for farming purpose in the valley areas include the services provided by ASOFRUT, Saving and Credit Cooperatives and other non-governmental organizations as shown in Table A.5.4-1.

The terms and conditions of major agriculture credits available in the valley areas are shown in Table A.5.4-2.

In addition to the above formal credit services, the existence of informal credit facilities is reported. Although not common, example of such informal credit is the supply of seed potatoes and farm inputs by intermediary or wholesaler on conditions that products be sold to them. This was observed in Pampa Grande, San Isidro, Saipina, Vallegrande, and Cochabamba market in Comarapa. In such cases, farmers position in product price bargaining is usually weak. Another informal credit common in all the major producing areas is credit selling of farm inputs by seed and chemical suppliers. In addition, relatives are reported to be sources of financial support in case of emergency needs.

From the results of the socio-economic survey it appears that fruit and vegetable growers in the major producing areas, irrespective of their scale of production, have relatively stable income and lifestyle. Although they have the potential to apply for credit, the needs for agriculture credit appear to be not so high.

4.3.8 Possible Source of Fund for Collection Center

The sources of funds can be broadly categorized into 2 groups, i.e., banks and non-banks financial institutions. Refer Table A.5.4-3 for summary of possible fund source for Collection Center.

In the Department of Santa Cruz, the banking institutions dedicated to agriculture credit are FINDESA and Banco Ganadero. When FINDESA is privatised, the agriculture sector will have to compete with other sectors for funding. Private bank that deals with the agriculture sector is the Banco Ganadero.

Non-bank institutions that deal with credit to the agriculture sectors are ASOFRUT, Cooperativa De Ahorro Y Credito "La Merced" Ltda, BOLINVEST, FONDECO and FDC. FDC fund although not dedicated for the agriculture sector only, would be available if the project complies with their guidelines for qualification. Funds from FDC is in the

form of an aid with no repayment required.

4.3.9 Budget & Balance Sheet

(1) Prefecture of Santa Cruz Department

According to the balance sheet for the months of Jan ~ Jul, 1998 for the Prefecture, the annual budget is Bs 811 million (about US\$146 m). Of this budget, the major expenditure are for personnel cost which accounts for about 47%. Budget for equipment and construction which is categorised in the Real Assets item is about Bs 191 million (US\$34 m) or 23% of the total budget. Of this item, construction and improvement of properties accounts for 76% and supply of machinery & equipment accounts for 18%.

(2) Municipality of Santa Cruz

For 1997, the Municipality had an asset of Bs 237.3 m (US\$42.7 m). Their expenditure for that year was Bs 237.6 m (US\$42.8 m) which meant that they suffered a deficit in their working capital of Bs 307,215 (US\$55,354). Their major source of income were from the Popular Participation fund of Bs 105.4 m (US\$19 m) and Municipal revenue of Bs 69.8 m (US\$12.5 m), which accounted for 46% and 30 % of the income. Their expenditure for the construction of facilities for public benefits (including markets) accounted for Bs 77 m (US\$13.8 m) or 32% of their total expenditure.

5 ENVIRONMENTAL EVALUATION AND MITIGATION MEASURES

5.1 Existing Environment Laws, Regulations and Standards

The Environment Law, Law No.1333 ("Ley del Medio Ambiente, Ley No. 1333") of 27 April, 1992 is of general nature and does not emphasize on any specific activities. Its objective is to protect and conserve the environment without affecting the development of the country and to seek the improvement of the quality of life of the population.

The law covers general disposition, the management of the environment and diverse environmental aspects including health and living environment. It covers renewable and non-renewable resources, environmental education, participation of populace as a security measure, administrative penalties are principally treated by the various sections of the law.

In addition to the law, there was a Supreme Decree No. 24176, which prescribed the regulations of the Environment Law. The regulation contains the technical and legal instruments to regulate the law considering the socio-economic, cultural, industrial and environmental components to ensure sustainable development.

The Vice-Minister of Environment ("Vice-Ministerio de Medio Ambiente") who reports to the Minister of Sustainable Development and Planning, is responsible for environmental planning and policy making in Bolivia.

The Environmental Law of Bolivia has called for the organizing of the Departmental Council for the Environment ("Consejos Departamentales del Medio Ambiente" - CODEMAs) to coordinate sustainable development activities in the departmental level. Presently, CODEMAs have been formed but are not functioning as yet.

For the organization chart of the concerned environment ministry and authority at the national and department level, refer to Figure A.5.5-1

5.2 Requirements for Environmental Impact Assessment (EIA) Study

5.2.1 National Level

According to Article 25 of the Environment Law, all works, public or private activities before its investment stage must be categorized into the following levels according to its environmental impact. The category levels are;

- I Requires an integrated EIA study.
- II Requires a specific EIA study.
- III Does not require specific EIA study but can be advised to revise its concept.
- IV Does not require EIA.

Category I and II requires EIA study to done by the promoter and to be presented to the competent Environment Authority for its review and approval. (refer to Figure A.5.5-2 for technical and administrative procedure for environmental impact evaluation)

5.2.2 Municipal Level

Municipal have their own ordinances to follow whenever project are located within municipal boundaries. At present, there is only one ordinance that has been approved with regards to environmental aspects, i.e., the ordinance governing the perforation of wells.

The Standards & Environment Secretariat (Secretaria de Normas y Medio Ambiente enforces the municipal laws and regulation pertaining to the environment.

An independent approved environment consultant will need to be appointed by the promoter of the Project to complete the Environmental Index ("Ficha Ambiental") by a Computerized Environment Impact Evaluation Procedure ("Procedimientos Computarizados para la Evaluacion de Impactos Ambientales", PCEIA).

This "Ficha Ambiental" will then be evaluated by the municipality for initial categorizing according to their guidelines. Their evaluation / categorization will then be submitted to the Prefecture and then subsequently to the Ministry level for approval of the classification of the project. If the project has been classified as Category I or II, an Environmental Impact Assessment study will need to be done.

If the project site is bordering another municipality, a transectorial agreement will need to be make between the municipalities to coordinate the environmental approval process and the subsequent monitoring and evaluation during the implementation stage.

5.3 Environmental Findings of Study Area / Sites

5.3.1 Production Area

Location	Environmental Findings	Possible Impacts of Collection/Distribution Center
Samaipata	There is an existing building (2 units) on the site which is presently used as a food storage warehouse by Program Pafs. It is located along Route 4. There is no apparent environmental problems or pollution as there is presently no economic activities on the site.	- Increase in vehicle traffic & noise - Increase in waste discharge (both solid and liquid waste) - Secondary impact on value of land (including surrounding land) - Social impact on beneficiaries
Mairana	The land is generally flat and is used for cattle & farming. Surrounding area is residential and farmland. It is located beside Route 4. There is no apparent environmental problems or pollution as there is minimum economic activities on or near the site.	- ditto -
Pampa Grande	The land has a slight slope along Route 4. The surrounding area is cattle and farm area. There is no apparent environmental problems or pollution as there is minimum economic activities on or near the site.	- ditto -
San Isidro	The land is flat with facilities (6 units) already built on the site. The facilities are unused. Nearby is a football playing field and residences. There is no apparent environmental problems or pollution as there is minimum economic activities on or near the site.	- ditto -
Comarapa	The site is flat with existing facilities (2	- ditto -

	units - one was abandoned during construction, the other is a guard post) built on it. Surrounding area is residential and farm land. There is no apparent environmental problems or pollution as there is minimum economic activities on or near the site.	
Saipina	The site is flat with a nearby cemetery. There is no apparent environmental problems or pollution as there is minimum economic activities on or near the site.	- ditto -
Valle Grande	The site has a moderate slope. Nearby is a stadium, small airport and residential area. There is no apparent environmental problems or pollution as there is minimum economic activities on or near the site.	- ditto -

Initial environmental examination of 2 scenarios were prepared. Case 1 represent the rehabilitation of existing facilities on the site for use as the Collection Center, and Case 2 represent construction of a new Collection Center facilities on the site. (see Tables A.5.5-1 and A.5.5-2).

There are no environmental constrains in any of the sites. Negative impacts of the Collection Distribution center are expected to be increase traffic noise and dust, and increase in solid and liquid waste discharge. The traffic noise and dust is of temporary nature and not expected to be a major issue in the remote setting. The solid and liquid waste discharge will have to handled by facility design and arranging with the municipality for rubbish collection services to the sites.

Positive impacts will be social impact on the beneficiaries and secondary impact on the value of land surrounding the project sites. Project management and operation will need to consider the equitability of benefit redistribution among the beneficiaries.

5.3.2 Abasto Market

The present Abasto Market is located within ring road no.3. The limited land area, close proximity to the city, and increasing economic activity of the market has created an unfavourable environment in terms of traffic congestion, noise, waste disposal problems, bad odour, pollution of the drainage canals, and unhygienic conditions.

1) Liquid Waste Disposal

Liquid waste from the market is discharged into the drainage canals surrounding the Abasto Market. There is no treatment of the waste before discharge into the canals. The open drainage canals emit foul odor and rubbish are thrown into it. The canals discharge into Pirai river. Future plans to address this problem may be to connect the sewage to existing city network or to incorporate a treatment facility within the market.

2) Noise Pollution

As for the noise of the market, there has not been any complains about noise of Abasto Market unlike the Los Pozos market. This is because of the open space design of Abasto Market unlike Los Pozos which is of a close nature whereby the noise is "trapped" and also the close proximity of residential houses. It is estimated that Abasto may have noise level of about 65 db whereas Los Pozos may be 80 ~90 db.

3) Solid Waste Disposal

The rubbish collection system for the city has been privatized. The contract to collect rubbish up to Ring Road No.5 (R5) is awarded to CLISA for a 5 years period. Outside R5, there are 8 micro-enterprises contractors that are collecting rubbish.

Within Ring Road No.1, rubbish is collected 7 days/week. From R1 to R2, rubbish is collected Mondays ~ Saturday. In the northern areas of R2 ~ R5, rubbish is collected Mon, Wed & Friday. In the southern areas of R2 ~ R5, rubbish is collected Tue, Thu & Sat. For the markets, rubbish collection is everyday, 7 days/week.

The landfill for the rubbish is located 18 km SE. It has a life up till 2002. However, this landfill will have a longer life if the city practices recycling and composting, which Municipal Urban Sanitary Department (Empresa Municipal De Limpieza Urbano, "EMDELU") intends to promote next year. Presently, 65% of the rubbish collected is organic waste.

EMDELU intends to introduce a tax of Bs0.5 per trader (gremialistas) / day to secure funds to clean the market more effectively. With this fund, continuous cleaning of the market (including public toilets) will be possible throughout the day, with nighttime washing and disinfecting to get rid of rodents & insects. A dedicated fenced rubbish area will be built to ensure cleanliness and prevent scavenging of the rubbish.

An initial environmental examination of Abasto Market considering the impact of relocating the wholesale function of the market to the New Wholesale Market was done. (see Table A.5.5-3).

Impact of relocating the wholesale function will be mainly in the improvement of the environment, reduction of traffic congestion and noise, and socio-economic in nature. With the relocation of wholesale activities, alternative use of car park space and wholesale space in the market could be explored. The lost of employment and changes to the marketing system / lifestyle associated with the relocation of wholesale activities from Abasto could be made up by alternative employment in the retail sector that will inevitably fill the void left by this relocation. The social impact will need to be equitably apportioned by designing the form of management and operational form of Abasto Market after the relocation of wholesale function.

5.3.3 New Wholesale Market

The initial environmental examination of the project for the New Wholesale

Market was done by completing the check-sheet using the criteria contained in the regulations pertaining to the Environmental Law. (see Table A.5.5-4)

Impact during implementation and construction will be temporary in nature such as constructional noise, dust, traffic, etc. Liquid waste treatment will have a major impact on the environment and must be incorporated into the design of the facilities. Solid waste collection by the municipality is necessary for the project to ensure sanitary environment. Operational noise from vehicle traffic could be minimised by appropriate design of the facilities and control of surrounding development so as not to encroach too close to the New Wholesale Market in the future. The management and operation setup of the New Wholesale Market will need to be designed ensure equitable redistribution of wealth and cost amongst the beneficiaries.

5.4 Significant Impact Evaluation

5.4.1 Consumption Site

(1) Abasto Market - Relocation of Wholesale function

<u>Significant Impact On</u>	<u>By</u>
Employment	alternative activities (+ve), reduced wholesale activities (-ve)
Physiological System	vehicle movement
Lifestyle	alternative activities in place of wholesale activities

1) Employment

With the relocation of the wholesale function, activities and persons that will be affected are:

Porters: The employment of porters to carry wholesale products from outside to inside the market and also within the market itself will be affected. Some of these porters will follow the wholesalers to the New Wholesale Market. Others that remain at Abasto will see a drop in their income as there will be more competition to carry the retail and consumer products.

New Retailers & Intermediaries: New retailers and intermediaries will be able to operate at Abasto Market as there will be more space for retail activities with the transfer of the wholesale function to the New Wholesale Market.

Car Park Attendant: With reduced truck traffic to Abasto after the relocation, car park attendants will suffer a lost in their income.

2) Physiological System

After the wholesale function is removed, the market will function more orderly due to reorganization of sales sections and vehicle circulation realizing ease of access for retailers and consumers. Impact of this reduction of large scale trucks will be less congestion on the road around Abasto Market, more efficient flow of traffic, goods and people, less noise, dust and traffic accidents.

3) Life-style

Impact on life-style will be associated with the changes due to the relocation of the wholesale function. Everyone that uses Abasto Market will be affected in one way or other. Porters may need to relocate to the New Wholesale Market or suffer a loss of income if they remain in Abasto Market. Retailers and intermediaries that rely on the wholesalers for their products will need to commute to the New Wholesale Market to purchase their products for subsequent sale at Abasto or other markets. Wholesalers will have to sell or rent out their lot in the market or convert the space for retail activities. Producer / Transporters will have to unload their products at Abasto or the New Wholesale Market depending on their point of sale. Consumers will enjoy better shopping access at the Abasto Market.

4) Classification of Impacts and Countermeasures

For classification of impacts and countermeasures to lessen, mitigate or compensate for these impacts, refer to Table A.5.5-5.

(2) New Wholesale Market

<u>Significant Impact On</u>	<u>By</u>
Suspended solids	sewage treatment
BODs	sewage treatment
Dissolved Oxygen	sewage treatment
Dissolved Solids	sewage treatment
Fecal coliform	sewage treatment
Employment	construction activities, marketing activities, surrounding activities, training, closure (-ve)
Scenery	landscaping
Physiological System	vehicle movement
Communal necessity	sale of products, education/training
Lifestyle	education/training

1) Existing Site Condition

The site for the New Wholesale Market is located next to UV189 in an undulating plot of land about 10 Ha. There are 2 existing brick factory on the site which will have to be relocated elsewhere. There are no other existing uses or activities on the site and no apparent pollution problems. Pipe water and electricity supply is available nearby. There are low bushes and some trees on the site which will have to be removed during the land preparation during the construction of the building and facilities.

2) Sewage / Waste treatment

Suspended solids, BODs, dissolved oxygen, dissolved solids, and fecal coliform are the major pollutants that will have to be treated by the waste treatment facility of the project. The table listed below from the environment regulations Annex A Table A-1 stipulates the values of the maximum discharge to receiving medium (generally a river).

Table A-1 from Annex A -

Parameter	Unit	Class "C"
pH		6 ~ 9
Temperature	°C	± 3°C of medium
Total Suspended Solid	mg/l	<50 ~ <1
Fecal Coliform (NMP/100ml)	N/100ml	<5000 & <1000 in 80% of samples
Oil & Grease	mg/l	0.3
BODs	mg/l	<20
COD	mg/l	<40
Chloride	mg/l	400 c. Cl
Ammonium	mg/l	2 c. NH ₃
Total Nitrogen	mg/l	12 c. N
Sulphur	mg/l	0.5

Class C is the recommended class for intensive agriculture activities. The other parameters listed in the Table A-1 are heavy metals and other compounds which are not applicable considering the waste contents of the New Wholesale Market. The waste treatment facility is expected to meet or exceed the quality of permissible limits so pollution of the site due to these expected major pollutants will not occur.

3) Water Supply and Quality

Analysis of the potable water supply near the site of the NWM revealed that the water quality from the tap is good and without any faecal coliform contamination. The residual chlorine level is acceptable (see Table A.5.5-6). Water requirements for the operation of the NWM is expected to be 140 cu.m per day. This will be met by the piped water supply with no need to exploit ground water resources. The water supply capacity to the area will be enough for the NWM without impacting on the other water users in the area.

4) Employment

During the construction stage, skilled and unskilled workers will be needed. There are not many local inhabitants in and around the site so the labour for the construction activities will have to come from elsewhere. As the site is within easy access from the city, the labour force is not expected to need accommodation within the site and therefore is not expected to create a problem with the local populace.

Other activities associated with the New Wholesale Market will also create new jobs and opportunities. In the unlikely event of closure of the New Wholesale Market, people working in the Market will lose their jobs.

5) Scenery

The project's building and facilities will impact on the existing farmland / rural scenery. The low buildings height will be of minimal impact on the landscape. Planting of trees and landscaping works in the project will further minimise the visual impact of the project.

6) **Physiological System**

The traffic of the NWM is expected to consist of the trucks, vans or jeeps carrying products into and outside the market, public transport vehicles (buses and taxis) used by the users, and private vehicles. This traffic is not expected to affect the local residents as a new access road specifically to the NWM will be built. This traffic will however change the traffic flow pattern around the area and new traffic controls (traffic lights, overpass, etc.) must be considered by the urban planning authorities for smooth integration of this NWM traffic into the main road traffic along Ring Road No.8 and Route 4.

7) **Communal necessity**

Wholesale marketing system will be changed and made more efficient with the operation of the New Wholesale Market which will subsequently impact on the retail marketing system.

The New Wholesale Market will also have a training component that will address the needs of the users and beneficiaries.

8) **Lifestyle**

Wholesalers, porters, transporters, producers and intermediaries that relocate from Abasto Market will see a change in their life-style and opportunities due to the more efficient wholesale function and change of marketing system. The more efficient system will create other opportunities in terms of alternative use of their free time (other employment or recreation). Changes in the marketing system will create new opportunities for other people to participate in the market thus creating new jobs in the market proper and surrounding area.

9) **Classification of Impacts and Countermeasures**

For classification of impacts and countermeasures to lessen, mitigate or compensate for these impacts, refer to Table A.5.5-7.

5.4.2 Production site

(1) **Collection and Distribution Center (Rehabilitation or new construction)**

<u>Impact On</u>	<u>By</u>
Employment	construction activities, marketing activities, surrounding activities, training, closure (-ve)
Scenery	landscaping
Physiological System	vehicle movement
Communal necessity	sale of products, education/training
Lifestyle	education/training

1) **Employment**

The rehabilitation construction activities will create employment for the local population. Although temporary in its impact, these employment will help boost the local economy. In the case of new construction, the impact will be greater as the work force will be larger and construction term will be longer.

The operation of the Collection and Distribution Center will also create new jobs and opportunities in the surrounding areas.

The training component of the Center will benefit the users and especially impact on the production and commercialization know-how.

In the unlikely event of closure, people associated with the Center will lose their jobs.

2) Water Supply and Quality

Water analysis of two sites in the production area, i.e., at Saipina and Pampa Grande was undertaken to assess the quality of the water supply (Table A.5.5-8 and 9). At both sites, water from the tap was of better quality than nearby river water which had higher suspended solids and coliform content. Residual chlorine in the tap water supply was not acceptable and it is recommended that chlorination of the water supply be undertaken in the Collection and Distribution centers.

3) Scenery

In the case of rehabilitation of existing buildings and facilities, there will be no new impact on the scenery. New Collection and Distribution Centers will impact on the existing farmland / rural scenery. The impact will be minimal as the building and facilities will be small scale and low in height. Planting of trees and landscaping works in the project will further minimise the visual impact of the project.

4) Physiological System

Traffic associated with the Collection and Distribution Centers will impact on the area but the low numbers and frequency of traffic is not expected to create any new traffic control requirements or safety hazard. The impact from the traffic will be noise and dust but these impacts will be of temporary nature and of short frequency / time.

5) Communal necessity

The Center will change and improve the marketing system of the products from the production area to Santa Cruz city.

The Center's training component will address the needs of the users and beneficiaries especially in the field of marketing, production and commercialization.

6) Lifestyle

The change in the marketing system will impact on the life-style of the producers as they will no longer have to accompany their products to Santa Cruz city to engage in sales. This free time can then be used for other activities such as house repairs, farming, taking care of family or recreation.

7) Classification of Impacts and Countermeasures

For classification of impacts and countermeasures to lessen, mitigate or compensate for these impacts, refer to Table A.5.5-10.

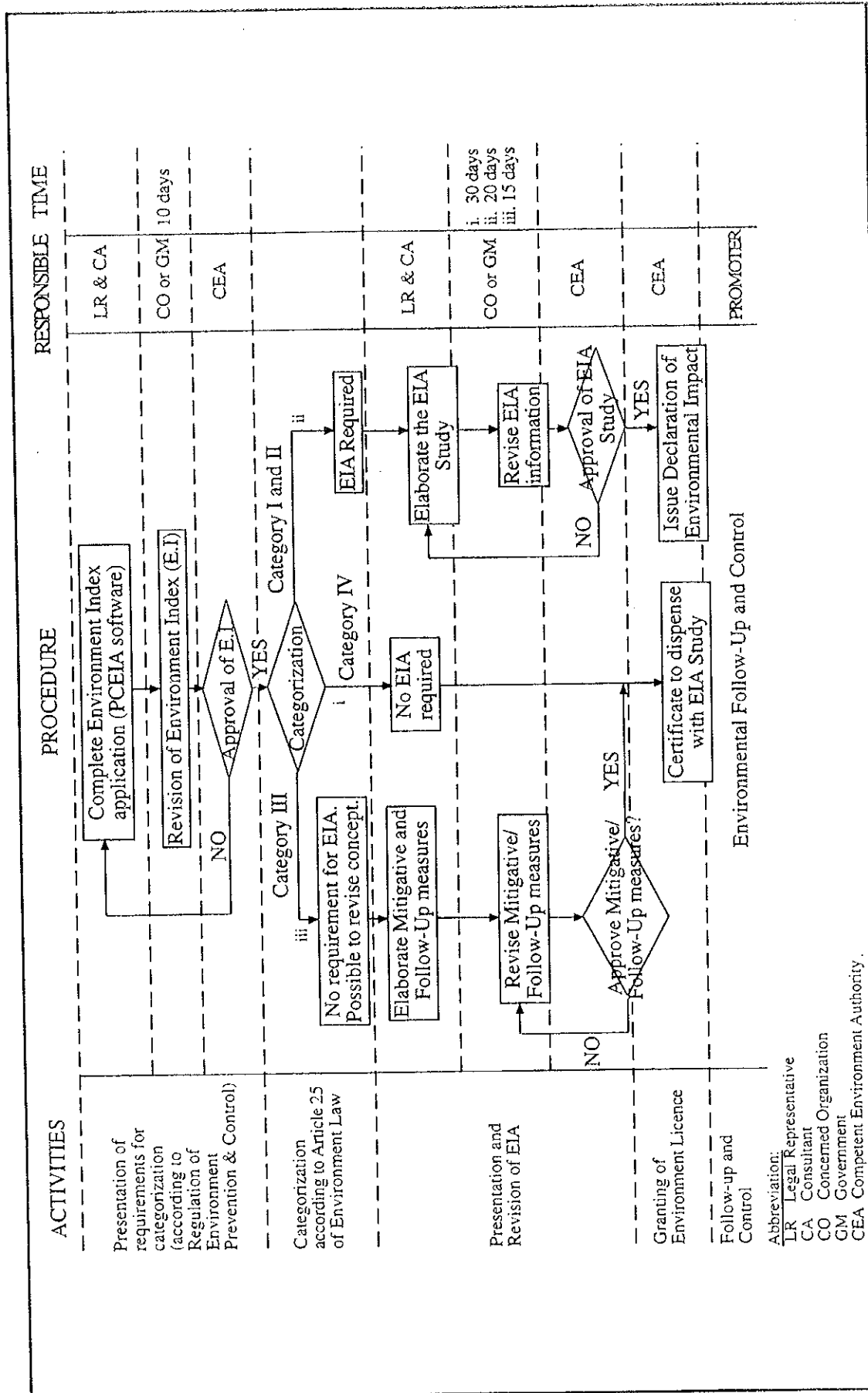
5.4.3 Classification of the Integrated Market Network System Project

Taking the above environmental evaluation into consideration and the incorporation into the design of both the physical facilities and operation / management setup, to mitigate the environmental impacts, classification of the project into level III is reasonable.

*Feasibility Study
for the Improvement of Agricultural
Marketing System
in
Santa Cruz*

ANNEX 5

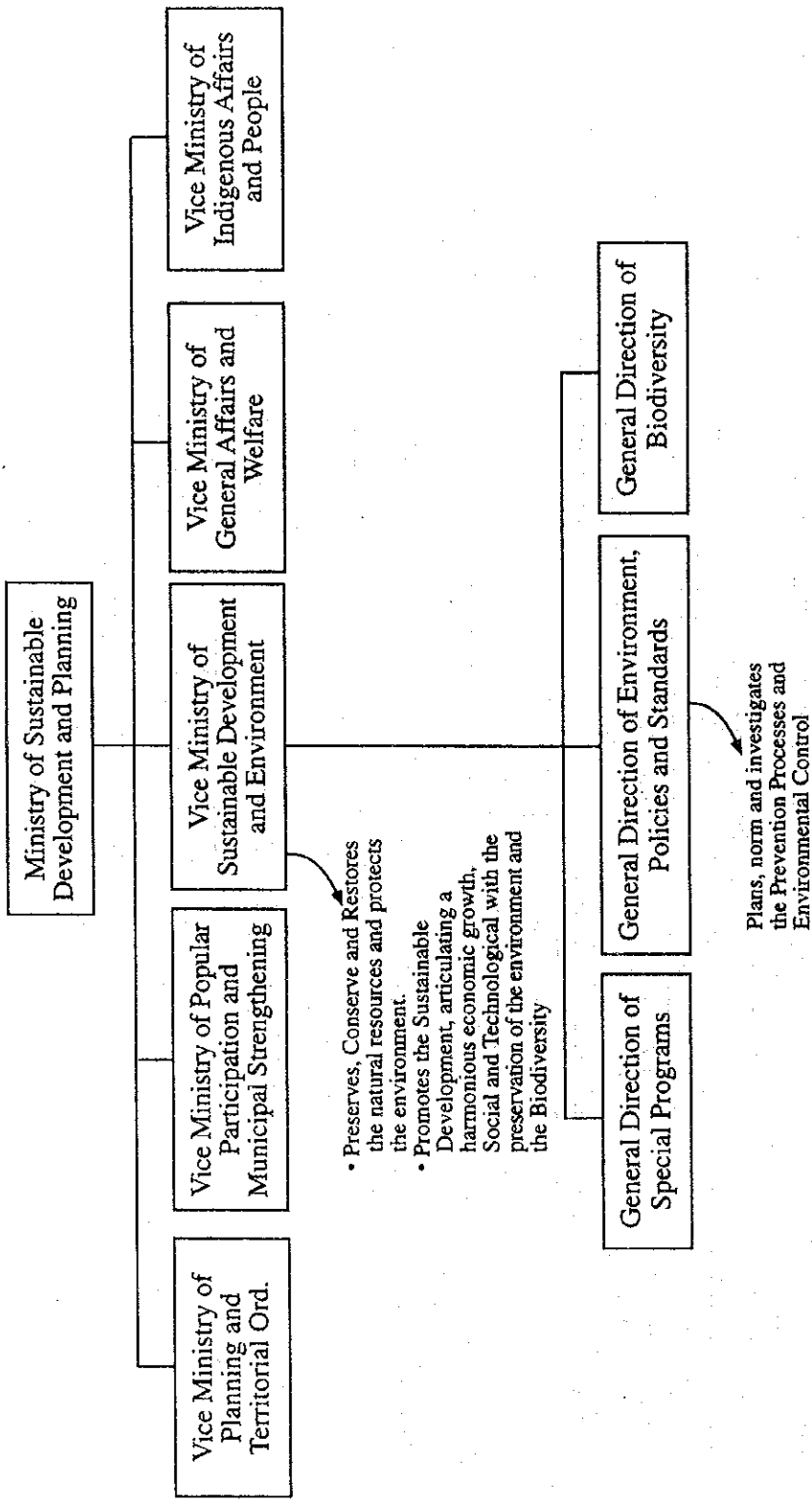
FIGURES & TABLES



Abbreviation:
 LR Legal Representative
 CA Consultant
 CO Concerned Organization
 GM Government
 CEA Competent Environment Authority.

Fig. A.5.5-1 Technical and Administrative Procedure for Environmental Impact Evaluation

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz Republic of Bolivia
 Japan International Cooperation Agency



Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz Republic of Bolivia
Japan International Cooperation Agency

Fig. A.5.5-2 Organization Chart of Ministry of Sustainable Development and Planning

Table A.5.2-1 ISSUES, DEVELOPMENT POLICIES AND IMPACT OF THE PROJECT (1/2)

ISSUES	DEVELOPMENT POLICY	IMPACT OF THE PROJECT (OUTLINE OF DEVELOPMENT PLAN)	POSITIVE AND NEGATIVE IMPACT FOR EACH TARGET GROUP														
			FARMER		INTERMEDIARY		WHOLESALE		RETAILER		CONSUMER		TRANSPORTER				
			POS.	NEG.	POS.	NEG.	POS.	NEG.	POS.	NEG.	POS.	NEG.	POS.	NEG.			
I. ISSUES IN THE PRODUCTION SITE			DEVELOPMENT POLICY FOR THE PRODUCTION AREA			ESTABLISHMENT OF COLLECTION AND DISTRIBUTION CENTER IN THE PRODUCTION AREA											
(1) ISSUES REGARDING PRODUCTION			(1) TECHNICAL IMPROVEMENT IN THE PRODUCTION SYSTEM			●		○		○		○		○		○	
1) Stagnant productivity and difficulty in production adjustment	1) Strengthening technical / guidance system	Merit: • Strengthening of technical guidance under the Project will raise the income of the farmers all well as other beneficiaries through improvement of productivity, quality and reduction of post harvest losses.															
2) Stagnant harvest volume, late introduction of crop rotation, low-level technology of fruit production	2) Introduction of production planning with consideration of demand and production trend in other areas																
3) Pest damage, increase in agricultural chemicals (growing discrepancy from consumers' awareness on product quality: Supermarkets are purchasing organic produce from farmers)																	
4) Inadequate system of technology introduction and extension																	
5) Declining competitiveness against other production areas of the country (Lowland within the prefecture and outside the prefecture) and neighboring countries including MERCOSUR																	
6) Underdevelopment of planned production system and loss from consequent overproduction																	
(2) ISSUES REGARDING COLLECTION / DISTRIBUTION AND TRANSPORTATION			(2) Development of collection and distribution centers to improve collection and distribution system and establish cooperative marketing system			●		○									
1) Maintaining traditional systems of collection/distribution, selection and packing of products (based on individual experiences of farmers)	1) Disseminating the benefits / significance of its introduction	Merit: • Farmers benefit from promoting their price bargaining power, advancing commercialization, more stable prices, and saving cost and time. • With the improvement of utility in the new wholesale market and existing Abasto market, the Center will benefit farmers as: (1) collection and distribution depot of agricultural cooperatives' wholesaling, (2) collection and distribution depot of wholesale division of supermarkets, (3) efficient fruit and vegetable providing site to farmers' direct sales spot and wholesalers.															
2) Non-use of existing collection centers (from lack of consensus, lack of leading farmers, and/or indistinct merit for users)	2) Raise the awareness through pilot project operation.																
3) Time loss resulting from lack of facilities such as collection center, cold storage, etc.	3) Stage-wise development of collection & distribution centers	Demerit: • Farmers may be adversely affected by the loss of opportunity to engage in direct sales by joining cooperative collection and distribution.															
4) Unstable system of remuneration for market price fluctuation and inefficient bargaining power of farmers	4) Technology transfer through model collection and distribution system (pilot project)																
5) Difficulty in collection and distribution arrangement caused by lack of access to information on market trend and prices																	
6) High share of transportation fee in the wholesale price and farmers' direct sales price, resulting in lowering the farmgate price and margins.																	
7) Underdevelopment of distribution system of citrus fruits increasingly produced in lowlands																	
(3) ISSUES REGARDING LAW/ INSTITUTION/ ORGANIZATION			(3) Strengthening of institutional guidance, instruction and extension of agricultural organization (aiming at collection and distribution)			●		○		○							
1) Inefficient agricultural organizations and inadequate leadership		Merit: • When it is fully implemented, well-controlled collection and distribution system will be realized.															
2) Insufficient experience in cooperative collection and distribution																	
3) Insufficient collective/ cooperative system among producers, producers' organizations (e.g., ASOFRUT), transporters and local governments		Demerit: • Accustomed individual trading method may be dispensed with for collective rules.															
(4) FINANCE SOURCES			(4) Development of sound and appropriate credit system and its dissemination to farmers			●		○									
1) Difficulty in accessing to formal credit systems for small-scale farmers' insufficient capital to qualify		Demerit: • Participants are expected to bear some fee corresponding to benefit															
2) Deficiency in capital for project investment and operation due to difficulty in accessing to local government's financial sources																	
ISSUES IN THE CONSUMPTION SITE			DEVELOPMENT POLICY FOR THE CONSUMPTION AREA			ESTABLISHMENT OF THE NEW WHOLESALE MARKET IN THE CONSUMPTION AREA											
(1) SCALE OF CONSUMPTION AND MARKETING			(1) Commercialization of fruits and vegetables corresponding to consumers request (supply volume, quality, and price)			●		○		○		○		○		○	
Intra-prefectural production unable to respond to the rapid population growth of Santa Cruz City and expanding needs for higher quality products		Merit: • With the promotion of commercialization, the farmers can expect income increase through production that suits the demand. Consumers will benefit from stable supply and higher quality of fruits and vegetables.															

Remark: ● Direct, ○ Indirect

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Table A.5.2-1 ISSUES, DEVELOPMENT POLICIES AND IMPACT OF THE PROJECT (2/2)

ISSUES	DEVELOPMENT POLICY	IMPACT OF THE PROJECT (OUTLINE OF DEVELOPMENT PLAN)	POSITIVE AND NEGATIVE IMPACT FOR EACH TARGET GROUP											
			FARMER		INTERMEDIARY		WHOLESALE		RETAILER		CONSUMER		TRANSPORTER	
			POS.	NEG.	POS.	NEG.	POS.	NEG.	POS.	NEG.	POS.	NEG.	POS.	NEG.
(2) MARKETING SYSTEM														
1) Increase of marketing volume bypassing Abasto market (ascribed to the emergence of supermarkets, who, however are interested in buying products from the market)	(2) Increasing benefits of the target group through separating and relocating wholesale function (farmers' direct sales, employment of small-scale intermediaries, efficient wholesalers and retailers, and users' benefits); the combined effect of the new wholesale market and existing Abasto market concentrating on retailing.	Merit: • Wholesalers in the new wholesale market (large-scale wholesalers relocating from Abasto market, wholesalers' groups organized to meet the qualifications, farmers and wholesale division of supermarkets newly participating in wholesale activities) will increase their income through improving their management. • At the existing Abasto market after wholesalers' relocation, the target group who mainly engage in retail activities will further their benefit in use of the market, farmers will be able to revive their direct sale function, more intermediaries can join, retailers will improve their sales efficiency, and consumers will benefit from efficient shopping. • Living environment of existing Abasto market will improve.	○				○	○						
2) Restricted truck accommodation capacity of existing Abasto market accompanied by the increase in distance covered and loading volume of trucks as fruit and vegetable marketing area expands														
3) Emergence of intermediaries in Abasto market in the place of farmers, raising marketing cost														
4) Retail function is prevailing over wholesale operation in Abasto after the issue of Decentralization Law														
5) Price formulation mechanism: The unstable employment situation in the informal sector coupled with the low purchasing power of the ordinary consumers acts to restrain the retail price fluctuation range.														
6) Fruit and vegetable quality control: inadequate standards of packing materials and its manufacturing cost				Demerit: • Surrounding environment of the new wholesale market will deteriorate.										
7) International metric system shall be adopted for trade of fruit and vegetable.														
(3) MERCOSUR														
Rapid increase of cheap imports not statistically recorded and lack of import control	(3) Raise the awareness on quality improvement, safety aspects, and develop quality improvement and safety certification system	Merit: • Farmers and consumers will directly benefit from the new market. It is expected that coordination between collection/distribution center and the new wholesale market will develop in order to offer high quality and stable supply of products and to be competitive in the international market.	○											
(4) QUALIFICATION FOR PARTICIPATING IN THE NEW WHOLESALE MARKET														
1) Wholesalers qualified to relocate from Abasto: Only 33% of wholesalers in Abasto are qualified by the criteria set in this project (who handle half of total traded fruit and vegetable volume in Abasto)	(4) Modernization/ rationalization of the wholesale function and provision of equitable opportunities for wholesalers	Merit: • Among small-scale farmers in the Valley areas, those who have the intention to participate in wholesale activities are able to qualify by organizing themselves, which may bring them higher income. Large-scale farmers of lowlands can curtail marketing cost by conducting wholesaling in the new market. Large scale wholesalers can also increase their income by organizing themselves. Supermarkets can save collection cost by establishing their wholesale division in the new wholesale market instead of individually building collection depot.	○					○	○					
2) Unqualified wholesalers: The remaining 67%, who are trading in smaller volumes maybe qualified through collective re-organization														
3) Potential future participants: small-scale farmers in the Valley areas, large-scale farmers in lowland and wholesale division of supermarkets														
(5) SOCIO-ECONOMY														
1) Income differential between wholesalers and retailers 2) Securing employment opportunities for retailers 3) Limited opportunities for new intermediaries	(5) Formalization of informal employment in existing Abasto market by establishment of the new wholesale market	Merit: • Small-scale intermediaries (mostly women) can expect to improve their access to the existing Abasto market.	○											
(6) ABASTO MARKET MANAGEMENT														
1) Confusion over laws and regulations: Farmers' Market founded upon MACA Law and Municipal Market upon municipal act. 2) Confusion over management system: Dissolution of the management committee and disorganized management caused by disintegration of the component bodies. 3) Confusion over user system: Use of market by unorganized wholesalers, retailers, intermediaries, farmers in direct trading, and consumers 4) Confusion over market maintenance: Discrepancy between municipal acts and its implementation (only part of maintenance activities are conducted)	(6) Establishing feasible and controllable laws and regulations and management system	Merit: • All target groups using the new wholesale market and existing Abasto market will be able to benefit from orderly use of the market that reduces time and cost.	○											
(7) FINANCE SOURCES														
1) Disagreement over the use of municipal financial sources within the Municipal Council 2) Consensus to be obtained among related organizations regarding distribution of investment funds of the new wholesale market (procuring from the Prefecture, Municipal, users, and/or external sources)	(7) Identifying fund procurement method through consensus in the Prefecture and Municipal Councils (based upon the results of feasibility study of the Project)	Demerit: • Each target group is expected to bear some fee corresponding to the benefit they receive.												

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration and financial management. The text notes that without reliable records, it is difficult to track the flow of funds and ensure that resources are being used effectively and efficiently.

2. The second part of the document addresses the challenges associated with data collection and analysis. It highlights that gathering accurate and timely data can be a complex task, often requiring significant resources and expertise. The text suggests that organizations should invest in robust data management systems and training to overcome these challenges. It also stresses the importance of ensuring the privacy and security of the data collected, as well as the need for clear policies and procedures regarding data access and use.

3. The third part of the document focuses on the role of technology in improving data management and analysis. It discusses how modern tools and software can streamline data collection, storage, and processing, leading to more efficient operations and better decision-making. The text mentions that while technology offers many benefits, it is not a silver bullet and must be implemented thoughtfully, taking into account the specific needs and constraints of the organization. It also notes that ongoing training and support are crucial for ensuring that staff can effectively utilize the technology.

4. The fourth part of the document discusses the importance of data-driven decision-making. It argues that organizations should base their strategic decisions on solid evidence and data, rather than relying solely on intuition or anecdotal evidence. The text suggests that this approach can lead to more informed and effective decision-making, ultimately resulting in better outcomes for the organization. It also notes that data-driven decision-making requires a culture of openness and collaboration, where data is shared and used to inform discussions and decisions across all levels of the organization.

5. The fifth part of the document concludes by summarizing the key points discussed and offering final thoughts on the importance of data management and analysis. It reiterates that these practices are essential for the success of any organization, particularly in the public sector where transparency and accountability are paramount. The text encourages organizations to continue to explore and invest in data management solutions and to foster a data-driven culture to achieve their goals and improve their services.



1. The first part of the document is a list of names and addresses of the members of the committee.

2. The second part of the document is a list of names and addresses of the members of the committee.

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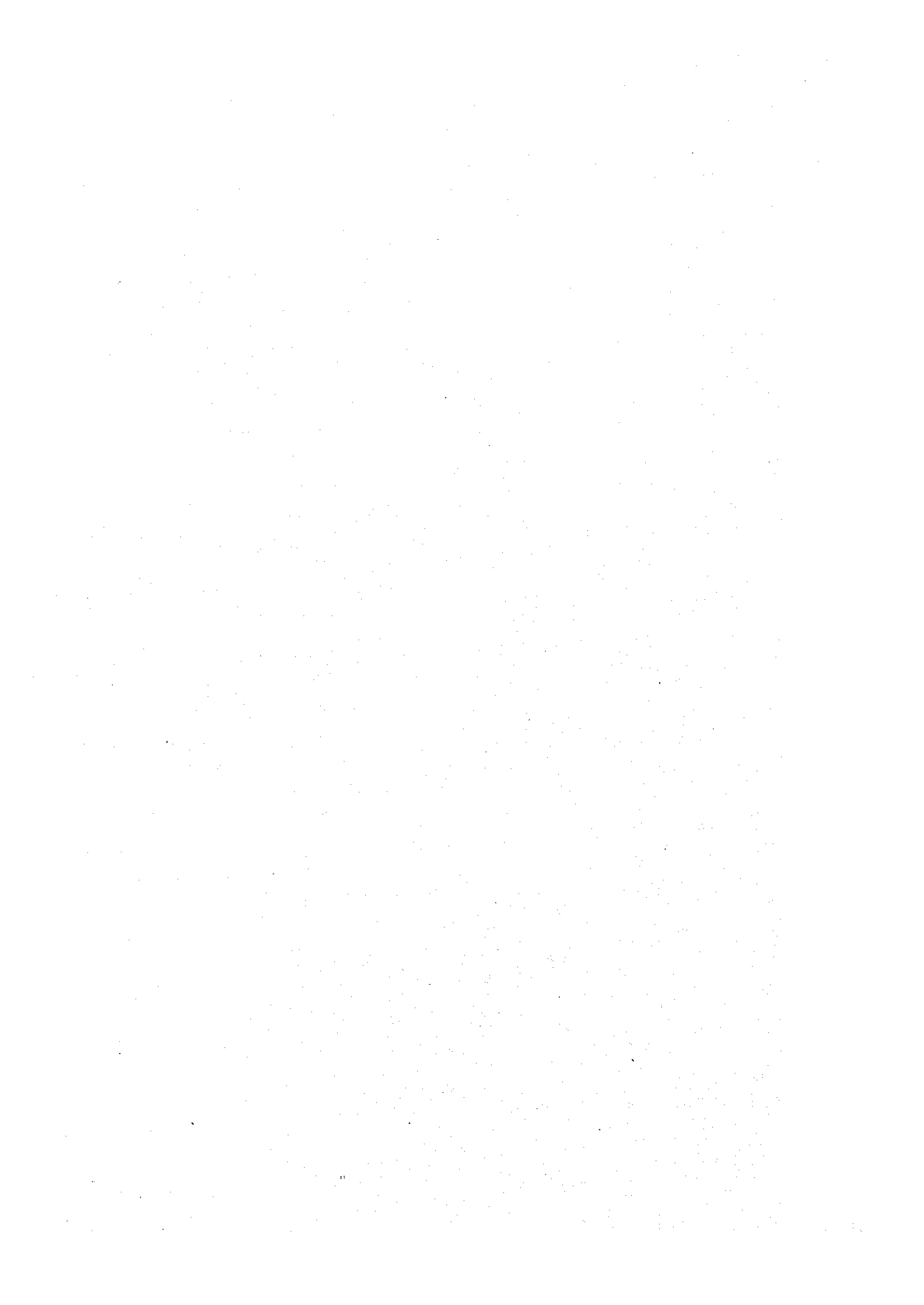


Table A.5.2-2 SUMMARY OF BENEFIT ITEMS

Benefit Items	Quantity	Unit:Bs/ year (1998)	US\$/year 2002	US\$/year 2010
1 City Entry Time Restriction				
A = no. of trucks over 10t having to wait for nighttime to enter city limits	13			
B = average waiting time lost due to this restriction (hr)	5			
C = opportunity cost of truck use (Bs/hr)	20			
Total benefit of entry at any time to NWM = A.B.C	Bs1,300 /day	Bs474,500	\$91,772	\$121,140
2 Space Restriction Inside Abasto Market				
A = no. of trucks forced to wait outside the market with their products until parking space is available inside Abasto market	36			
B = average waiting time lost due to this restriction (hr)	9.3			
C1 = opportunity cost of truck use (Bs/hr)	20			
B2a, Benefit of space availability at any time at NWM = A.B.C	Bs6,696 /day	Bs2,444,040	\$472,698	\$623,962
A = no. selling produce from truck	12			
B = time lost due to the method of sale from truck (hr)	19			
C = opportunity cost of truck use (Bs/hr)	20			
B2b, Benefit of immediate unloading for transporter = A.B.C	Bs4,560 /day	Bs1,664,400	\$321,909	\$424,920
D = no. of producers/intermediaries affected	12			
E = producers'/intermediaries' time lost by engaging in selling from truck (hr)	228			
F = opportunity cost of producers'/intermediaries (Bs/hr)	4			
B2c, Benefit of immediate unloading for producers/intermediaries = D.E.F	Bs912 /day	Bs332,880	\$64,382	\$84,984
Total benefit of space restriction inside Abasto Market =		Bs4,441,320	\$858,990	\$1,133,866
3 Selling from truck outside Abasto Market				
A = no. of trucks affected	14			
B = time lost due to the method of sale from truck (hr)	12			
C = opportunity cost of truck use (Bs/hr)	20			
B3a, Benefit of immediate unloading for transporter = A.B.C	Bs3,360 /day	Bs1,226,400	\$237,196	\$313,099
A = no. of trucks affected	14			
T = Tonnage sold outside market (assume average 10 t truck)	140			
C2 = Additional Cost of handling (include parking fee, porter fee) per ton	30			
B3b, Benefit of reduce handling cost for producer/wholesaler = T.C2	Bs4,200 /day	Bs1,533,000	\$296,495	\$391,374
D = no. of producers/intermediaries affected	14			
E = producers'/intermediaries' time lost by engaging in selling from truck (hr)	336			
F = opportunity cost of producers/intermediaries (Bs/hr)	4			
B3c, Benefit of immediate unloading for producers/intermediaries = D.E.F	Bs1,344 /day	Bs490,560	\$94,879	\$125,240
Total benefit of not selling from truck =		Bs3,249,960	\$628,570	\$829,713
4 Reduction of Quality Loss (Value Loss) for Tomato				
A = Minimum price at peak over-supply (Bs/kg)	1.00			
B = Tonnage thrown away per week during over-supply (t)	4			
C = No. of times in a year that experience over supply	24			
D = Tonnage affected by over-supply condition (t)	96			
B4, Benefit of Quality loss = D.A	Bs96,000	Bs96,000	\$19,790	\$25,745
5 Consumer time savings				
A = av. time saved per person per trip due to less congestion (minutes)	10			
B = no. of families affected (2000)	205,036			
C = no. of families affected (2010)	360,254			
D1 = person days saved (2000)	76,889			
D2 = person days saved (2010)	135,095			
E = opportunity cost of consumer day (Bs/day)	10			
Total benefit of time saved (year 2000)	Bs768,885		\$145,144	\$240,383
6 Production Increase				
A = Increase production volume by products (t)				
B = Price of products (70% of net producer's prices)				
Total benefit of Production Increase = A.B				\$1,623,559
7 Commercialization Rate Increase				
A = Volume increase due to commercialization rate increase by products (t)				
B = Price of products (50% of net producer's prices)				
Total benefit of Commercialization Rate increase = A.B				\$469,290

Assumptions:

- Number of trucks affected is based on survey conducted during Phase 1 and 2.
- Yearly truck projection based on marketing volume projection.
- Increase in production volume is based on projections in Annexe 2.
- Projection of commercialization rate increase based on data in Annexe 2.
- Net Producer's Prices of products: Potato US\$220, Tomato US\$135, Lettuce US\$100, Choclo US\$285, Green Pepper US\$205, Beans/Peas US\$435, Peach/Plum US\$420, Citrus US\$135.
- Consumer time saving and number of families affected based on Master Plan data.
- Peak season for tomato based on annual cropping pattern data from CAO, 1998.
- Exchange rate of Bs5.62 to 1US\$ (Nov. 1998)

Table A.5.3-1 PHYSICAL LIFE, DEPRECIATION, AND MAINTENANCE OF PROJECT COMPONENTS

New Wholesale Market

Facilities & Equipment	Physical Life (years)	Maintenance ratio (%)	Total Cost	Depreciation	Maintenance	Reinvestment Cost			
						5 yr	10 yr	15 yr	20 yr
1. Buildings	30	0.5%	14,768,755	319,990	47,998				
2. Equipment									
- Tel/fax	5	5.0%	11,550	1,502	375	7,508	7,508	7,508	7,508
- Truck scale	10	5.0%	16,485	1,072	536		10,715		10,715
- Jet cleaner	10	5.0%	8,138	529	264		5,290		5,290
- Computers, etc.	5	5.0%	31,500	4,095	1,024	20,475	20,475	20,475	20,475
- Weighing scale	10	5.0%	22,050	1,433	717		14,333		14,333
- Handling tool (cart)	5	2.0%	26,460	3,440	344	17,199	17,199	17,199	17,199
- Furniture	15	2.0%	48,300	2,093	628			31,395	
- Laboratory equipment	5	5.0%	10,500	1,365	341	6,825	6,825	6,825	6,825
3. Pavement	25	0.5%	1,555,250	40,437	5,055				
Total Cost			16,498,988	375,954	57,282	52,007	82,344	83,402	82,344

Remarks:

1. Total cost of facilities & equipment excludes Bolivian side investment in land preparation and infrastructure extension cost.
2. Depreciation, Maintenance and Reinvestment costs are calculated based on 65% of Total Cost assuming depreciation, maintenance & reinvestment are undertaken at local prices by local contractors/suppliers.

Collection and Distribution Centers

Facilities & Equipment	Physical Life (years)	Maintenance ratio (%)	Total Cost	Depreciation	Maintenance	Reinvestment Cost	
						10 yr	20 yr
1. Buildings & pavement	25	0.5%	2,502,009	100,080	12,510		
2. Equipment							
- Furniture and computer	10	5.0%	131,250	13,125	6,563	131,250	131,250
- Vehicle (pick up truck)	10	5.0%	151,200	15,120	7,560	151,200	151,200
- Motorcycle	10	5.0%	53,550	5,355	2,678	53,550	53,550
Total Cost			2,838,009	133,680	29,310	336,000	336,000

Remarks:

1. Depreciation, maintenance, and reinvestment cost are staggered due to staged wise development of the C/D Centers.

Table A.5.3-2 Project Cost of Products Collection / Distribution Center - San Isidro

No.	Items	Financial Cost (US\$)	Economic Cost (US\$)
1	Building Construction Cost		
1	Building Reform Works - Direct Construction Cost	27,043	23,711
2	External Works	34,980	30,670
3	Total Cost	62,023	54,381
4	Overhead and Profit	23,569	20,665
5	Consulting service fee	3,101	2,719
6	Grand Total Cost for Building Construction	88,692	77,765
2	Equipment Procurement Cost	49,350	48,034
Grand Total (US\$)		138,042	125,799

Remark :

1. Land acquisition cost not included in the cost estimate.

Table A.5.3-3 Project Cost of Products Collection / Distribution Center - Samaipata

No.	Items	Financial Cost (US\$)	Economic Cost (US\$)
1	Building Construction Cost		
1	Building Reform Works - Direct Construction Cost	25,291	22,175
2	External Works	17,000	14,906
3	Total Cost	42,291	37,081
4	Overhead and Profit	16,071	14,091
5	Consulting service fee	2,115	1,854
6	Grand Total Cost for Building Construction	60,476	53,025
2	Equipment Procurement Cost	40,950	39,858
Grand Total (US\$)		101,426	92,883

Remark :

1. Land acquisition cost not included in the cost estimate.

Table A.5.3-4 Project Cost of Products Collection / Distribution Center - Valle Grande

No.	Items	Financial Cost (US\$)	Economic Cost (US\$)
1	Building Construction Cost		
1	Building Works - Direct Construction Cost	226,761	199,137
2	External Works	35,570	31,171
3	Main Line of Infrastructure in the Site (incl. extension/inte	12,550	10,793
4	Total Cost	274,881	241,101
5	Overhead and Profit	104,455	91,618
6	Consulting service fee	13,744	12,055
7	Grand Total Cost for Building Construction	393,080	344,774
2	Equipment Procurement Cost	49,350	48,034
Grand Total (US\$)		442,430	392,808

Remark :

1. Land acquisition cost not included in the cost estimate.

Table A.5.3-5 Project Cost of Products Collection / Distribution Center - Saipina

No.	Items	Financial Cost (US\$)	Economic Cost (US\$)
1	Building Construction Cost		
1	Building Works - Direct Construction Cost	270,636	237,673
2	External Works	38,410	33,661
3	Main Line of Infrastructure in the Site (incl. extension/inta	35,550	30,573
4	Total Cost	344,596	301,907
5	Overhead and Profit	130,946	114,725
6	Consulting service fee	17,230	15,095
7	Grand Total Cost for Building Construction	492,772	431,726
2	Equipment Procurement Cost	49,350	48,034
Grand Total (US\$)		542,122	479,760

Remark :

1. Land acquisition cost not included in the cost estimate.

Table A.5.3-6 Project Cost of Products Collection / Distribution Center - Mairana

No.	Items	Financial Cost (US\$)	Economic Cost (US\$)
1	Building Construction Cost		
1	Building Works - Direct Construction Cost	270,636	237,673
2	External Works	38,410	33,661
3	Main Line of Infrastructure in the Site (incl. extension/inta	18,600	15,996
4	Total Cost	327,646	287,330
5	Overhead and Profit	124,505	109,185
6	Consulting service fee	16,382	14,366
7	Grand Total Cost for Building Construction	468,534	410,881
2	Equipment Procurement Cost	37,800	36,792
Grand Total (US\$)		506,334	447,673

Remark :

1. Land acquisition cost not included in the cost estimate.

Table A.5.3-7 Project Cost of Products Collection / Distribution Center - Pampa Grande

No.	Items	Financial Cost (US\$)	Economic Cost (US\$)
1	Building Construction Cost		
1	Building Works - Direct Construction Cost	358,386	314,744
2	External Works	65,620	57,518
3	Main Line of Infrastructure in the Site (incl. extension/inta	12,550	10,793
4	Total Cost	436,556	383,056
5	Overhead and Profit	165,891	145,561
6	Consulting service fee	21,828	19,153
7	Grand Total Cost for Building Construction	624,275	547,770
2	Equipment Procurement Cost	49,350	48,034
Grand Total (US\$)		673,625	595,804

Remark :

1. Land acquisition cost not included in the cost estimate.

Table A.5.3-8 Project Cost of Products Collection / Distribution Center - Comarapa

No.	Items	Financial Cost (US\$)	Economic Cost (US\$)
1	Building Construction Cost		
1	Building Works - Direct Construction Cost	226,761	199,137
2	External Works	35,570	31,171
3	Main Line of Infrastructure in the Site (incl. extension/int)	12,550	10,793
4	Total Cost	274,881	241,101
5	Overhead and Profit	104,455	91,618
6	Consulting service fee	13,744	12,055
7	Grand Total Cost for Building Construction	393,080	344,774
2	Equipment Procurement Cost	40,950	39,858
Grand Total (US\$)		434,030	384,632

Remark :

1. Land acquisition cost not included in the cost estimate.

Table A.5.3-9 ECONOMIC EVALUATION FOR ALL 7 COLLECTION & DISTRIBUTION CENTER - Scenario I

	Unit: US\$			
	Investment	O/M Cost	Benefits	Net Benefit
1999		5,472		-5,472
2000	125,799	16,051		-141,850
2001		103,582		-103,582
2002	969,708	156,576		-1,126,284
2003	1,437,613	307,598		-1,745,211
2004		438,058		-438,058
2005		498,426	23,570	-474,856
2006		549,216	265,067	-284,150
2007		601,483	348,515	-252,968
2008		636,928	1,179,619	542,691
2009		679,480	1,844,070	1,164,590
2010	18,900	683,440	1,858,204	1,155,864
2011	22,680	683,440	1,740,882	1,034,762
2012	52,020	683,440	1,682,220	946,760
2013	118,260	683,440	1,652,890	851,190
2014	65,250	683,440	1,638,224	889,534
2015	5,760	683,440	1,630,892	941,692
2016	2,880	683,440	1,627,225	940,905
2017		683,440	1,625,392	941,952
2018		683,440	1,624,476	941,036
2019		683,440	1,624,017	940,577
			EIRR =	9.7%
			NPV =	-459,841

Remark:

1. Investment cost of facilities based on economic cost.
2. Labour component of institution training / technical extension was estimated to be 70% of cost component and multiplied by 0.44 conversion factor.
3. Labour component of operation and maintenance was estimated to be 50% of cost component and multiplied by 0.44 conversion factor.
4. Benefits from commercialization reduced by 50% compared with Scenario III.

Table A.5.3-10 ECONOMIC SENSITIVITY ANALYSIS FOR ALL 7 COLLECTION & DISTRIBUTION CENTERS - SCENARIO I

Scenario I: Sensitivity Analysis, Case 1				Scenario I: Sensitivity Analysis, Case 2			
Investment Cost +10%, Benefit ±0%			Unit: US\$	Investment Cost ±0%, Benefit +10%			Unit: US\$
Investment	O/M Cost	Benefits	Net Benefit	Investment	O/M Cost	Benefits	Net Benefit
1999		5,472	-5,472	1999		5,472	-5,472
2000	138,379	16,051	-154,430	2000	125,799	16,051	-141,850
2001		103,582	-103,582	2001		103,582	-103,582
2002	1,066,679	156,576	-1,223,255	2002	969,708	156,576	-1,126,284
2003	1,581,374	307,598	-1,888,973	2003	1,437,613	307,598	-1,745,211
2004		438,058	-438,058	2004		438,058	-438,058
2005		498,426	23,570	2005		498,426	25,927
2006		549,216	265,067	2006		549,216	291,573
2007		601,483	348,515	2007		601,483	383,367
2008		636,928	1,179,619	2008		636,928	1,297,581
2009		679,480	1,844,070	2009		679,480	2,028,477
2010	20,790	683,440	1,858,204	2010	18,900	683,440	2,044,024
2011	24,948	683,440	1,740,882	2011	22,680	683,440	1,914,970
2012	57,222	683,440	1,682,220	2012	52,020	683,440	1,850,442
2013	130,086	683,440	1,652,890	2013	118,260	683,440	1,818,179
2014	71,775	683,440	1,638,224	2014	65,250	683,440	1,802,047
2015	6,336	683,440	1,630,892	2015	5,760	683,440	1,793,981
2016	3,168	683,440	1,627,225	2016	2,880	683,440	1,789,948
2017		683,440	1,625,392	2017		683,440	1,787,931
2018		683,440	1,624,476	2018		683,440	1,786,923
2019		683,440	1,624,017	2019		683,440	1,786,419
		EIRR =	9.0%			EIRR =	11.7%
		NPV =	-618,016			NPV =	-73,286

Scenario I: Sensitivity Analysis, Case 3				Scenario I: Sensitivity Analysis, Case 4			
Investment Cost -10%, Benefit ±0%			Unit: US\$	Investment Cost ±0%, Benefit -10%			Unit: US\$
Investment	O/M Cost	Benefits	Net Benefit	Investment	O/M Cost	Benefits	Net Benefit
1999		5,472	-5,472	1999		5,472	-5,472
2000	113,219	16,051	-129,270	2000	125,799	16,051	-141,850
2001		103,582	-103,582	2001		103,582	-103,582
2002	872,737	156,576	-1,029,313	2002	969,708	156,576	-1,126,284
2003	1,293,852	307,598	-1,601,450	2003	1,437,613	307,598	-1,745,211
2004		438,058	-438,058	2004		438,058	-438,058
2005		498,426	23,570	2005		498,426	21,213
2006		549,216	265,067	2006		549,216	238,560
2007		601,483	348,515	2007		601,483	313,664
2008		636,928	1,179,619	2008		636,928	1,061,657
2009		679,480	1,844,070	2009		679,480	1,659,663
2010	17,010	683,440	1,858,204	2010	18,900	683,440	1,672,384
2011	20,412	683,440	1,740,882	2011	22,680	683,440	1,566,793
2012	46,818	683,440	1,682,220	2012	52,020	683,440	1,513,998
2013	106,434	683,440	1,652,890	2013	118,260	683,440	1,487,601
2014	58,725	683,440	1,638,224	2014	65,250	683,440	1,474,402
2015	5,184	683,440	1,630,892	2015	5,760	683,440	1,467,802
2016	2,592	683,440	1,627,225	2016	2,880	683,440	1,464,503
2017		683,440	1,625,392	2017		683,440	1,462,853
2018		683,440	1,624,476	2018		683,440	1,462,028
2019		683,440	1,624,017	2019		683,440	1,461,616
		EIRR =	10.4%			EIRR =	7.4%
		NPV =	-301,666			NPV =	-846,395

Table A.5.3-11 INCOME STATEMENT AND CASH FLOW FOR ALL 7 COLLECTION AND DISTRIBUTION CENTERS - SCENARIO I

Unit: US\$

	1	2	3	4	5	6	7	8	9	10	11
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
I											
Income Statement											
A. Revenue	62,500	83,400	246,000	453,900	600,600	600,600	762,800	888,700	1,020,200	1,100,400	1,115,900
1) User fee	62,500	83,400	246,000	453,900	600,600	600,600	762,800	888,700	1,020,200	1,100,400	1,115,900
B. Expense	89,300	99,400	362,000	628,700	723,100	841,100	910,400	992,900	1,052,000	1,057,500	1,057,500
1) Operation & management	73,100	83,200	288,900	497,200	591,600	709,600	778,900	861,400	920,500	920,500	926,000
2) Depreciation	16,200	16,200	73,100	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500
3) Interest											
C. Income before Depr.&Interest	-16,600	200	-42,900	-43,300	9,000	53,200	109,800	109,800	158,800	179,900	189,900
D. Net Income	-26,800	-16,000	-116,000	-174,800	-122,500	-78,300	-21,700	27,300	48,400	58,400	58,400
II											
Cash Flow											
A. Source of Funds	138,042	1,085,978	1,571,989	1,613,989	9,000	53,200	109,800	109,800	158,800	179,900	189,900
1) Government	138,042	1,085,978	1,613,989								
2) Loan											
3) Own equity											
4) Depreciation	16,200	16,200	73,100	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500
5) Net income	-26,800	-16,000	-116,000	-174,800	-122,500	-78,300	-21,700	27,300	48,400	58,400	58,400
B. Uses of Funds	138,042	1,085,978	1,613,989								
1) Building	138,042	1,085,978	1,613,989								
2) Equipment											
3) Reinvestment											
4) Repayment of loan											
C. Net cash flow	-10,600	200	-42,900	-43,300	9,000	53,200	109,800	109,800	158,800	179,900	168,900

	12	13	14	15	16	17	18	19	20
	2011	2012	2013	2014	2015	2016	2017	2018	2019
I									
Income Statement									
A. Revenue	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900
1) User fee	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900
B. Expense	1,057,500	1,057,500	1,057,500	1,057,500	1,057,500	1,057,500	1,057,500	1,057,500	1,057,500
1) Operation & management	926,000	926,000	926,000	926,000	926,000	926,000	926,000	926,000	926,000
2) Depreciation	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500
3) Interest									
C. Income before Depr.&Interest	189,900	189,900	189,900	189,900	189,900	189,900	189,900	189,900	189,900
D. Net Income	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400
II									
Cash Flow									
A. Source of Funds	189,900	189,900	189,900	189,900	189,900	189,900	189,900	189,900	189,900
1) Government									
2) Loan									
3) Own equity									
4) Depreciation	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500
5) Net income	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400
B. Uses of Funds	25,200	57,800	131,400	72,500	6,400	3,200			
1) Building									
2) Equipment	25,200	57,800	131,400	72,500	6,400	3,200			
3) Reinvestment									
4) Repayment of loan									
C. Net cash flow	164,700	132,100	58,500	117,400	183,500	186,700	189,900	189,900	189,900

Remarks:
1. Institutional training and technology transfer cost to be borne by Government separately and not included in this financial analysis of management body.

Table A.5.3-12 FINANCIAL EVALUATION FOR ALL 7 COLLECTION & DISTRIBUTION CENTERS - SCENARIO I

	Unit: US\$			
	Investment	Reinvestmt	Income before Depr.	Net Revenue
2000	138,042			-138,042
2001			-10,600	-10,600
2002	1,085,978		200	-1,085,778
2003	1,613,989		-42,900	-1,656,889
2004			-43,300	-43,300
2005			9,000	9,000
2006			53,200	53,200
2007			109,800	109,800
2008			158,800	158,800
2009			179,900	179,900
2010		21,000	189,900	168,900
2011		25,200	189,900	164,700
2012		57,800	189,900	132,100
2013		131,400	189,900	58,500
2014		72,500	189,900	117,400
2015		6,400	189,900	183,500
2016		3,200	189,900	186,700
2017			189,900	189,900
2018			189,900	189,900
2019			189,900	189,900
2020			189,900	189,900
			FIRR =	-2.2%
			NPV =	-1,497,856

Table A.5.3-13 FINANCIAL SENSITIVITY ANALYSIS FOR ALL 7 COLLECTION & DISTRIBUTION CENTERS - SCENARIO I

Scenario I: Sensitivity Analysis, Case 1				Scenario I: Sensitivity Analysis, Case 2			
Investment Cost +10%, Revenue ±0%			Unit: US\$	Investment Cost ±0%, Revenue +10%			Unit: US\$
Investment	Reinvestmt	Income before Depr.	Net Revenue	Investment	Reinvestmt	Income before Depr.	Net Revenue
2000	151,846		-151,846	2000	138,042		-138,042
2001		-10,600	-10,600	2001		-9,540	-9,540
2002	1,194,576	200	-1,194,376	2002	1,085,978	220	-1,085,758
2003	1,775,388	-42,900	-1,818,288	2003	1,613,989	-38,610	-1,652,599
2004		-43,300	-43,300	2004		-38,970	-38,970
2005		9,000	9,000	2005		9,900	9,900
2006		53,200	53,200	2006		58,520	58,520
2007		109,800	109,800	2007		120,780	120,780
2008		158,800	158,800	2008		174,680	174,680
2009		179,900	179,900	2009		197,890	197,890
2010	23,100	189,900	166,800	2010	21,000	208,890	187,890
2011	27,720	189,900	162,180	2011	25,200	208,890	183,690
2012	63,580	189,900	126,320	2012	57,800	208,890	151,090
2013	144,540	189,900	45,360	2013	131,400	208,890	77,490
2014	79,750	189,900	110,150	2014	72,500	208,890	136,390
2015	7,040	189,900	182,860	2015	6,400	208,890	202,490
2016	3,520	189,900	186,380	2016	3,200	208,890	205,690
2017		189,900	189,900	2017		208,890	208,890
2018		189,900	189,900	2018		208,890	208,890
2019		189,900	189,900	2019		208,890	208,890
2020		189,900	189,900	2020		208,890	208,890
		FIRR =	-3.1%			FIRR =	-1.2%
		NPV =	-1,696,325			NPV =	-1,437,147

Scenario I: Sensitivity Analysis, Case 3				Scenario I: Sensitivity Analysis, Case 4			
Investment Cost -10%, Revenue ±0%			Unit: US\$	Investment Cost ±0%, Revenue -10%			Unit: US\$
Investment	Reinvestmt	Income before Depr.	Net Revenue	Investment	Reinvestmt	Income before Depr.	Net Revenue
2000	124,238		-124,238	2000	138,042		-138,042
2001		-10,600	-10,600	2001		-11,660	-11,660
2002	977,380	200	-977,180	2002	1,085,978	180	-1,085,798
2003	1,452,590	-42,900	-1,495,490	2003	1,613,989	-47,190	-1,661,179
2004		-43,300	-43,300	2004		-47,630	-47,630
2005		9,000	9,000	2005		8,100	8,100
2006		53,200	53,200	2006		47,880	47,880
2007		109,800	109,800	2007		98,820	98,820
2008		158,800	158,800	2008		142,920	142,920
2009		179,900	179,900	2009		161,910	161,910
2010		189,900	189,900	2010	21,000	170,910	149,910
2011	18,900	189,900	171,000	2011	25,200	170,910	145,710
2012	22,680	189,900	167,220	2012	57,800	170,910	113,110
2013	52,020	189,900	137,880	2013	131,400	170,910	39,510
2014	118,260	189,900	71,640	2014	72,500	170,910	98,410
2015	65,250	189,900	124,650	2015	6,400	170,910	164,510
2016	5,760	189,900	184,140	2016	3,200	170,910	167,710
2017	2,880	189,900	187,020	2017		170,910	170,910
2018		189,900	189,900	2018		170,910	170,910
2019		189,900	189,900	2019		170,910	170,910
2020		189,900	189,900	2020		170,910	170,910
		FIRR =	-1.2%			FIRR =	-3.2%
		NPV =	-1,292,910			NPV =	-1,558,565

Table A.5.3-14 PROJECT COST OF THE NEW WHOLESALE MARKET

No.	Items	Total Project Cost		Phase 1 Cost		Phase 2 Cost	
		Financial Cost (US\$)	Economic Cost (US\$)	Financial Cost (US\$)	Economic Cost (US\$)	Financial Cost (US\$)	Economic Cost (US\$)
1	Land Preparation Cost						
1	Tree Cutting	595	522	595	522	0	0
2	Land Cut-off	225,000	197,280	225,000	197,280	0	0
3	Sand Filling	793,000	695,302	793,000	695,302	0	0
	- Sub-total					0	0
4	Overhead and Profit	387,066	278,688	387,066	278,688	0	0
5	Consulting service fee	50,930	22,409	50,930	22,409	0	0
6	Total Cost	1,456,591	1,194,201	1,456,591	1,194,201	0	0
2	Infrastructure Extension Cost						
1	Electric Main Line	10,000	8,768	10,000	8,768	0	0
2	Telephone Main Line	1,000	877	1,000	877	0	0
3	Potable Water Main Line	150	132	150	132	0	0
4	Potable Water Measure Meter	824	722	824	722	0	0
5	Access roads (projected city road)	270,000	236,736	270,000	236,736	0	0
6	Access road to Site	137,500	120,560	137,500	120,560	0	0
7	Rain drainage ditch	97,200	85,225	97,200	85,225	0	0
	Sub-total					0	0
8	Overhead and Profit	196,336	141,362	196,336	141,362	0	0
9	Consulting service fee	25,834	11,367	25,834	11,367	0	0
10	Total Cost	738,844	605,749	738,844	605,749	0	0
3	Building Construction Cost						
1	Building Works - Direct Construction Cost						
F-1	Marketing Hall						
	Marketing Hall - 1	4,110,720	3,608,521	1,027,680	902,130	3,083,040	2,706,391
	Marketing Hall - 2	1,618,596	1,420,855	0	0	1,618,596	1,420,855
F-2	Administration Office	1,148,832	983,656	1,148,832	983,656	0	0
F-3	Canteen	507,225	431,922	507,225	431,922	0	0
F-4	Shops	240,472	207,414	240,472	207,414	0	0
F-5	Electric Power Station	336,189	294,905	336,189	294,905	0	0
F-6	City Water Reservoir / Elevated Water Tank	285,184	251,035	285,184	251,035	0	0
F-7	Public W.C.	584,712	512,983	391,757	343,698	192,955	169,284
F-8	Wasted Water Treatment / Seepage Pit	493,500	474,222	493,500	474,222	0	0
F-9	Garbage Collection Yard	57,120	50,446	28,560	25,223	28,560	25,223
F-10	Guard Box	10,030	8,350	10,030	8,350	0	0
	Sub-total	9,392,580	8,244,308	4,469,429	3,922,555	4,923,151	4,321,753
2	External Works						
A	Concrete interlocking block pavement	1,263,600	1,107,924	505,440	443,170	758,160	664,755
B	Concrete pavement	262,400	230,072	157,440	138,043	104,960	92,029
C	Lawn planting	21,300	18,676	10,650	9,338	10,650	9,338
D	Crushed stone pavement	29,250	25,646	29,250	25,646	0	0
E	Concrete wall for land adjustment	70,560	61,867	70,560	61,867	0	0
F	Concrete drainage ditch	290,400	254,623	145,200	127,311	145,200	127,311
G	Gate	7,500	6,576	7,500	6,576	0	0
H	Fence	68,000	59,622	0	0	68,000	59,622
I	Street lights	19,200	16,512	14,400	12,384	4,800	4,128
	Sub-total	2,032,210	1,781,519	940,440	824,336	1,091,770	957,183
3	Main Line of Infrastructure in the Site						
A	Electricity Main Line						
	HV Incoming System	104,600	89,956	104,600	89,956	0	0
	Main Feeder System	244,183	209,997	97,673	83,999	146,510	125,998
	External Lighting Work	180,450	155,187	135,338	116,390	45,113	38,797
	Telephone System	288,000	247,680	288,000	247,680	0	0
	Public Address System	13,950	11,997	10,463	8,998	3,488	2,999
	Lightning Protection System	15,300	13,158	15,300	13,158	0	0
B	City Water Main Line	57,500	49,450	23,000	19,780	34,500	29,670
C	Wasted Water Main Line (incl. seepage pipe)	57,750	49,665	23,100	19,866	34,650	29,799
	Sub-total	961,733	827,090	697,473	599,827	264,260	227,263
4	Special Equipment						
E-1	Handling Tool	26,460	26,447	3,704	3,703	22,756	22,745
E-2	Telephone/Fax	11,550	11,545	11,550	11,545	0	0
E-3	Computer	31,500	31,485	31,500	31,485	0	0
E-4	Measurement Tool						
	Truck Scale	16,485	16,477	16,485	16,477	0	0
	Balance	22,050	22,040	3,087	3,086	18,963	18,954
E-5	Apparatus for food inspection	10,500	10,495	10,500	10,495	0	0
E-6	High pressure water cleaner	8,138	8,134	1,628	1,627	6,510	6,507
	Sub-total	126,683	126,622	78,454	78,417	48,229	48,206
5	Engineer/Supervisor Dispatch	14,500	14,355	4,350	4,307	10,150	10,049
6	Total Cost	12,527,706	10,993,895	6,190,146	5,429,441	6,337,559	5,564,454
7	Overhead and Profit	2,718,512	2,385,675	1,343,262	1,178,189	1,375,250	1,207,486
8	Consulting service fee	1,252,771	1,099,390	619,015	542,944	633,756	556,445
9	Grand Total Cost for Building Construction	16,498,988	14,478,960	8,152,423	7,150,574	8,346,566	7,328,386
Grand Total Cost (US\$)		18,694,423	16,278,909	10,347,857	8,950,524	8,346,566	7,328,386

Remark:

1. Land acquisition for projected city roads, access road to projected road, and project site is not included in the project cost estimate

**Table A.5.3-15 ECONOMIC EVALUATION OF NEW WHOLESALE MARKET
- SCENARIO II**

	Unit: US\$			
	Investment	O/M Cost	Benefits	Net Benefit
2001	8,950,524			-8,950,524
2002	7,328,386	61,274	1,724,476	-5,665,184
2003		122,549	1,799,554	1,677,006
2004		122,549	1,874,633	1,752,084
2005		122,549	1,949,711	1,827,162
2006	51,982	122,549	2,024,789	1,850,258
2007		122,549	2,099,867	1,977,319
2008		122,549	2,174,946	2,052,397
2009		122,549	2,250,024	2,127,475
2010		122,549	2,325,102	2,202,553
2011	82,305	122,549	2,400,180	2,195,327
2012		122,549	2,475,259	2,352,710
2013		122,549	2,550,337	2,427,788
2014		122,549	2,625,415	2,502,866
2015		122,549	2,700,493	2,577,945
2016	83,377	122,549	2,775,572	2,569,646
2017		122,549	2,850,650	2,728,101
2018		122,549	2,925,728	2,803,179
2019		122,549	3,000,806	2,878,258
2020		122,549	3,075,885	2,953,336
2021	82,305	122,549	3,150,963	2,946,109
			EIRR =	11.8%
			NPV =	-222,013

Remarks:

1. Reinvestment cost taken as 65% of initial economic cost based on assumption of local prices/supplier.
2. Net present value based on social discount rate of 12.07%

**Table A.5.3-16 ECONOMIC SENSITIVITY ANALYSIS OF NEW WHOLESALE MARKET
- SCENARIO II**

Scenario II: Sensitivity Analysis, Case 1

	Investment Cost +10%, Benefit ±0%		Unit: US\$	
	Investment	O/M Cost	Benefits	Net Benefit
2001	9,845,576			-9,845,576
2002	8,061,225	61,274	1,724,476	-6,398,023
2003		122,549	1,799,554	1,677,006
2004		122,549	1,874,633	1,752,084
2005		122,549	1,949,711	1,827,162
2006	57,180	122,549	2,024,789	1,845,060
2007		122,549	2,099,867	1,977,319
2008		122,549	2,174,946	2,052,397
2009		122,549	2,250,024	2,127,475
2010		122,549	2,325,102	2,202,553
2011	90,535	122,549	2,400,180	2,187,096
2012		122,549	2,475,259	2,352,710
2013		122,549	2,550,337	2,427,788
2014		122,549	2,625,415	2,502,866
2015		122,549	2,700,493	2,577,945
2016	91,714	122,549	2,775,572	2,561,308
2017		122,549	2,850,650	2,728,101
2018		122,549	2,925,728	2,803,179
2019		122,549	3,000,806	2,878,258
2020		122,549	3,075,885	2,953,336
2021	90,535	122,549	3,150,963	2,937,879
				EIRR = 10.5%
				NPV = -1,611,225

Scenario II: Sensitivity Analysis, Case 2

	Investment Cost ±0%, Benefit +10%		Unit: US\$	
	Investment	O/M Cost	Benefits	Net Benefit
2001	8,950,524			-8,950,524
2002	7,328,386	61,274	1,896,924	-5,492,737
2003		122,549	1,979,510	1,856,961
2004		122,549	2,062,096	1,939,547
2005		122,549	2,144,682	2,022,133
2006	51,982	122,549	2,227,268	2,052,737
2007		122,549	2,309,854	2,187,305
2008		122,549	2,392,440	2,269,891
2009		122,549	2,475,026	2,352,477
2010		122,549	2,557,612	2,435,063
2011	82,305	122,549	2,640,198	2,435,345
2012		122,549	2,722,784	2,600,236
2013		122,549	2,805,370	2,682,822
2014		122,549	2,887,957	2,765,408
2015		122,549	2,970,543	2,847,994
2016	83,377	122,549	3,053,129	2,847,203
2017		122,549	3,135,715	3,013,166
2018		122,549	3,218,301	3,095,752
2019		122,549	3,300,887	3,178,338
2020		122,549	3,383,473	3,260,924
2021	82,305	122,549	3,466,059	3,261,205
				EIRR = 13.4%
				NPV = 1,221,440

Scenario II: Sensitivity Analysis, Case 3

	Investment Cost -10%, Benefit ±0%		Unit: US\$	
	Investment	O/M Cost	Benefits	Net Benefit
2001	8,055,471			-8,055,471
2002	6,595,547	61,274	1,724,476	-4,932,346
2003		122,549	1,799,554	1,677,006
2004		122,549	1,874,633	1,752,084
2005		122,549	1,949,711	1,827,162
2006	46,784	122,549	2,024,789	1,855,457
2007		122,549	2,099,867	1,977,319
2008		122,549	2,174,946	2,052,397
2009		122,549	2,250,024	2,127,475
2010		122,549	2,325,102	2,202,553
2011	74,074	122,549	2,400,180	2,203,557
2012		122,549	2,475,259	2,352,710
2013		122,549	2,550,337	2,427,788
2014		122,549	2,625,415	2,502,866
2015		122,549	2,700,493	2,577,945
2016	75,039	122,549	2,775,572	2,577,984
2017		122,549	2,850,650	2,728,101
2018		122,549	2,925,728	2,803,179
2019		122,549	3,000,806	2,878,258
2020		122,549	3,075,885	2,953,336
2021	74,074	122,549	3,150,963	2,954,340
				EIRR = 13.5%
				NPV = 1,167,198

Scenario II: Sensitivity Analysis, Case 4

	Investment Cost ±0%, Benefit -10%		Unit: US\$	
	Investment	O/M Cost	Benefits	Net Benefit
2001	8,950,524			-8,950,524
2002	7,328,386	61,274	1,552,028	-5,837,632
2003		122,549	1,619,599	1,497,050
2004		122,549	1,687,169	1,564,621
2005		122,549	1,754,740	1,632,191
2006	51,982	122,549	1,822,310	1,647,780
2007		122,549	1,889,881	1,767,332
2008		122,549	1,957,451	1,834,902
2009		122,549	2,025,021	1,902,473
2010		122,549	2,092,592	1,970,043
2011	82,305	122,549	2,160,162	1,955,309
2012		122,549	2,227,733	2,105,184
2013		122,549	2,295,303	2,172,754
2014		122,549	2,362,874	2,240,325
2015		122,549	2,430,444	2,307,895
2016	83,377	122,549	2,498,014	2,292,089
2017		122,549	2,565,585	2,443,036
2018		122,549	2,633,155	2,510,606
2019		122,549	2,700,726	2,578,177
2020		122,549	2,768,296	2,645,747
2021	82,305	122,549	2,835,866	2,631,013
				EIRR = 10.2%
				NPV = -1,665,466

Table A.5.3-17 ANNUAL OPERATION COST OF NEW WHOLESALE MARKET

Number of Personnel and Annual Cost								
Position	Status		Unit Salary		Annual Salary		Total Annual	Total Annual
	Permanent	Contract	Permanent	Contract	Permanent	Contract	Salary (Bs)	Salary (US\$)
Manager	1		5,000		60,000		60,000	10,676
Administrative chief	1		3,000		36,000		36,000	6,406
Marketing chief	1		3,000		36,000		36,000	6,406
Secretary	1		2,000		24,000		24,000	4,270
Security control	1	5	2,000	1,500	24,000	90,000	114,000	20,285
Finance & account		2	2,000	1,500		36,000	36,000	6,406
Personnel & registration	1	1	2,000	1,500	24,000	18,000	42,000	7,473
Maintenance	1		2,000	1,500	24,000		24,000	4,270
Information	1	2	2,000	1,500	24,000	36,000	60,000	10,676
Monitoring		1	2,000	1,500		18,000	18,000	3,203
Total	8	11			252,000	198,000	450,000	\$80,071 A

Electricity & Water Charges

Electricity & Water charges per day	Bs820	
Electricity & Water charges per day	\$146	
Electricity & Water charges per year	\$53,256	B

Tel/fax

No. of calls per month	900	
Charges per month	\$13	
Charges per year	\$161	C

Total Annual Operation Cost (A+B+C) \$133,488

Total Annual Economic Operation Cost \$71,833

Table A.5.3-18 INCOME STATEMENT AND CASH FLOW FOR NEW WHOLESALE MARKET

Unit: US\$

Income Statement	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
A. Revenue	739,771	1,480,165	1,527,398	1,574,631	1,621,864	1,669,097	1,716,330	1,763,563	1,810,796	1,858,029	1,905,262
1) Net income of wholesalers	728,414	1,456,827	1,503,972	1,549,816	1,595,801	1,641,786	1,687,771	1,733,756	1,779,741	1,825,726	1,871,711
2) Entering truck charge	11,357	23,338	24,076	24,815	25,554	26,293	27,032	27,771	28,510	29,249	30,000
B. Expense	283,362	566,724	566,724	566,724	566,724	566,724	566,724	566,724	566,724	566,724	566,724
1) Operation	66,744	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488
2) Maintenance	28,641	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282
3) Depreciation	187,977	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954
4) Interest											
C. Income before Depr. & Interest	644,386	1,289,395	1,336,628	1,383,861	1,431,094	1,478,327	1,525,560	1,572,793	1,620,026	1,667,259	1,714,492
D. Net income	456,408	912,819	960,674	1,008,529	1,056,384	1,104,239	1,152,094	1,200,000	1,247,905	1,295,810	1,343,715
Cash Flow	8,152,423	8,990,957	1,289,395	1,336,628	1,383,861	1,431,094	1,478,327	1,525,560	1,572,793	1,620,026	1,667,259
1) Government	8,152,423	8,990,957									
2) Loan											
3) Own equity											
4) Depreciation											
5) Net income											
B. Uses of Funds	8,152,423	8,346,566									
1) Building	8,073,969	8,286,337									
2) Equipment	78,454	46,229									
3) Retirement											
4) Repayment of loan											
5) Net cash flow	644,386	1,289,395	1,336,628	1,383,861	1,431,094	1,478,327	1,525,560	1,572,793	1,620,026	1,667,259	1,714,492
C. Net cash flow											
1) Government											
2) Loan											
3) Own equity											
4) Depreciation											
5) Net income											
B. Uses of Funds	82,344	52,007									
1) Building											
2) Equipment											
3) Retirement											
4) Repayment of loan											
5) Net cash flow											

Income Statement	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A. Revenue	2,016,116	2,079,185	2,142,254	2,205,323	2,268,392	2,331,461	2,394,530	2,457,600	2,520,670	2,583,739
1) Net income of wholesalers	1,983,765	2,045,757	2,107,750	2,169,743	2,231,736	2,293,729	2,355,722	2,417,715	2,479,708	2,541,699
2) Entering truck charge	32,351	33,428	34,504	35,581	36,658	37,734	38,811	39,887	40,964	42,041
B. Expense	566,724	566,724	566,724	566,724	566,724	566,724	566,724	566,724	566,724	566,724
1) Operation	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488
2) Maintenance	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282
3) Depreciation	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954
4) Interest										
C. Income before Depr. & Interest	1,825,346	1,888,415	1,951,484	2,014,553	2,077,622	2,140,692	2,203,761	2,266,831	2,329,900	2,392,969
D. Net income	1,449,391	1,512,461	1,575,530	1,638,599	1,701,668	1,764,738	1,827,807	1,890,876	1,953,946	2,017,015
Cash Flow	1,825,346	1,888,415	1,951,484	2,014,553	2,077,622	2,140,692	2,203,761	2,266,831	2,329,900	2,392,969
1) Government										
2) Loan										
3) Own equity										
4) Depreciation										
5) Net income										
B. Uses of Funds	83,402	83,402								
1) Building										
2) Equipment										
3) Retirement										
4) Repayment of loan										
5) Net cash flow										

Remarks:

- Revenue and Expenses during the 1st year of operation will be approximately half of normal years operation due to phased construction.
- Net income of wholesalers based on Annex 2, Table A.2.4-26.
- Truck charge at Bs.1 for Jeep, Bs.3 for 5 ton truck, Bs.5 for 10 ton truck, and Bs.10 for 20 ton truck.
- Depreciation, Maintenance and Retirement costs are calculated based on 65% of Building/Equipment cost assuming depreciation, maintenance & retirement are undertaken at local prices by local contractors/suppliers.
- Operation expense (personnel, utilities, electricity, etc.) rationalized for effective operation.

**Table A.5.3-19 FINANCIAL EVALUATION OF NEW WHOLESALE MARKET
- SCENARIO II**

Unit: US\$				
	Investment	Reinvestmt	Income before Depr.	Net Revenue
2001	8,152,423			-8,152,423
2002	8,346,566		644,386	-7,702,180
2003			1,289,395	1,289,395
2004			1,336,628	1,336,628
2005			1,383,861	1,383,861
2006		52,007	1,446,930	1,394,924
2007			1,509,999	1,509,999
2008			1,573,069	1,573,069
2009			1,636,138	1,636,138
2010			1,699,207	1,699,207
2011		82,344	1,762,276	1,679,932
2012			1,825,346	1,825,346
2013			1,888,415	1,888,415
2014			1,951,484	1,951,484
2015			2,014,553	2,014,553
2016		83,402	2,077,623	1,994,221
2017			2,140,692	2,140,692
2018			2,203,761	2,203,761
2019			2,266,831	2,266,831
2020			2,329,900	2,329,900
2021		82,344	2,392,969	2,310,625
			FIRR =	7.7%
			NPV =	-3,955,997

Remark:

1. Investment cost does not include land acquisition, preparation, and infrastructure extension cost.
2. Reinvestment cost taken as 65% of initial financial cost based on assumption of local prices/supplier.
3. Net present value based on social discount rate of 12.07%

Table A.5.3-20 FINANCIAL SENSITIVITY ANALYSIS FOR NEW WHOLESALE MARKET - SCENARIO II

Scenario II: Sensitivity Analysis, Case 1					Scenario II: Sensitivity Analysis, Case 2				
Investment Cost +10%, Revenue ±0%				Unit: US\$	Investment Cost ±0%, Revenue +10%				Unit: US\$
	Investment	Reinvestmt	Income before Depr.	Net Revenue		Investment	Reinvestmt	Income before Depr.	Net Revenue
2001	8,967,665			-8,967,665	2001	8,152,423			-8,152,423
2002	9,181,223		644,386	-8,536,837	2002	8,346,566		708,824	-7,637,742
2003			1,289,395	1,289,395	2003			1,418,334	1,418,334
2004			1,336,628	1,336,628	2004			1,470,291	1,470,291
2005			1,383,861	1,383,861	2005			1,522,247	1,522,247
2006		57,207	1,446,930	1,389,723	2006		52,007	1,591,623	1,539,617
2007			1,509,999	1,509,999	2007			1,660,999	1,660,999
2008			1,573,069	1,573,069	2008			1,730,375	1,730,375
2009			1,636,138	1,636,138	2009			1,799,752	1,799,752
2010			1,699,207	1,699,207	2010			1,869,128	1,869,128
2011		90,578	1,762,276	1,671,698	2011		82,344	1,938,504	1,856,160
2012			1,825,346	1,825,346	2012			2,007,880	2,007,880
2013			1,888,415	1,888,415	2013			2,077,256	2,077,256
2014			1,951,484	1,951,484	2014			2,146,633	2,146,633
2015			2,014,553	2,014,553	2015			2,216,009	2,216,009
2016		91,742	2,077,623	1,985,881	2016		83,402	2,285,385	2,201,983
2017			2,140,692	2,140,692	2017			2,354,761	2,354,761
2018			2,203,761	2,203,761	2018			2,424,137	2,424,137
2019			2,266,831	2,266,831	2019			2,493,514	2,493,514
2020			2,329,900	2,329,900	2020			2,562,890	2,562,890
2021		90,578	2,392,969	2,302,391	2021		82,344	2,632,266	2,549,922
			FIRR =	6.6%				FIRR =	8.9%
			NPV =	-5,355,064				NPV =	-2,952,529

Scenario II: Sensitivity Analysis, Case 3					Scenario II: Sensitivity Analysis, Case 4				
Investment Cost -10%, Revenue ±0%				Unit: US\$	Investment Cost ±0%, Revenue -10%				Unit: US\$
	Investment	Reinvestmt	Income before Depr.	Net Revenue		Investment	Reinvestmt	Income before Depr.	Net Revenue
2001	7,337,181			-7,337,181	2001	8,152,423			-8,152,423
2002	7,511,909		644,386	-6,867,524	2002	8,346,566		579,947	-7,766,619
2003			1,289,395	1,289,395	2003			1,160,455	1,160,455
2004			1,336,628	1,336,628	2004			1,202,965	1,202,965
2005			1,383,861	1,383,861	2005			1,245,475	1,245,475
2006		46,806	1,446,930	1,400,124	2006		52,007	1,302,237	1,250,231
2007			1,509,999	1,509,999	2007			1,358,999	1,358,999
2008			1,573,069	1,573,069	2008			1,415,762	1,415,762
2009			1,636,138	1,636,138	2009			1,472,524	1,472,524
2010			1,699,207	1,699,207	2010			1,529,286	1,529,286
2011		74,110	1,762,276	1,688,167	2011		82,344	1,586,049	1,503,705
2012			1,825,346	1,825,346	2012			1,642,811	1,642,811
2013			1,888,415	1,888,415	2013			1,699,573	1,699,573
2014			1,951,484	1,951,484	2014			1,756,336	1,756,336
2015			2,014,553	2,014,553	2015			1,813,098	1,813,098
2016		75,061	2,077,623	2,002,561	2016		83,402	1,869,860	1,786,459
2017			2,140,692	2,140,692	2017			1,926,623	1,926,623
2018			2,203,761	2,203,761	2018			1,983,385	1,983,385
2019			2,266,831	2,266,831	2019			2,040,147	2,040,147
2020			2,329,900	2,329,900	2020			2,096,910	2,096,910
2021		74,110	2,392,969	2,318,859	2021		82,344	2,153,672	2,071,328
			FIRR =	9.0%				FIRR =	6.5%
			NPV =	-2,556,929				NPV =	-4,959,465

**Table A.5.3-21 ECONOMIC EVALUATION OF NWM + C/D CENTERS
- SCENARIO III**

	Unit: US\$			
	Investment	O/M Cost	Benefits	Net Benefit
1999		5,472		-5,472
2000	125,799	16,051		-141,850
2001	8,950,524	103,582		-9,054,106
2002	8,298,094	217,850	1,741,558	-6,774,387
2003	1,437,613	430,147	1,817,358	-50,402
2004		560,606	1,893,158	1,332,552
2005		620,974	2,016,009	1,395,034
2006	79,972	671,765	2,333,215	1,581,479
2007		724,032	2,594,723	1,870,691
2008		759,477	3,599,059	2,839,582
2009		802,029	4,345,742	3,543,713
2010	18,900	805,989	4,440,449	3,615,560
2011	149,303	805,989	4,516,339	3,561,047
2012	52,020	805,989	4,592,229	3,734,220
2013	118,260	805,989	4,668,119	3,743,870
2014	65,250	805,989	4,744,009	3,872,770
2015	5,760	805,989	4,819,899	4,008,150
2016	131,152	805,989	4,895,789	3,958,648
2017		805,989	4,971,678	4,165,690
2018		805,989	5,047,568	4,241,580
2019		805,989	5,123,458	4,317,470
2020		805,989	5,199,348	4,393,359
2021	126,623	805,989	5,275,238	4,342,626
			EIRR =	12.6%
			NPV =	512,578

Remarks:

1. Reinvestment cost of NWM taken as 65% of initial economic cost based on assumption of local prices/ supplier.
2. Net present value based on social discount rate of 12.07%

Table A.5.3-22 ECONOMIC SENSITIVITY ANALYSIS FOR NWM + C/D CENTERS - SCENARIO III

Scenario III: Sensitivity Analysis, Case 1

Investment Cost +10%, Benefit ±0%				Unit: US\$
Investment	O/M Cost	Benefits	Net Benefit	
1999		6,019		-6,019
2000	138,379	17,656		-156,035
2001	9,845,576	113,941		-9,959,517
2002	9,127,903	239,635	1,741,558	-7,625,981
2003	1,581,374	473,162	1,817,358	-237,178
2004		616,667	1,893,158	1,276,491
2005		683,072	2,016,009	1,332,937
2006	87,969	738,941	2,333,215	1,506,305
2007		796,435	2,594,723	1,798,288
2008		835,424	3,599,059	2,763,634
2009		882,232	4,345,742	3,463,510
2010	20,790	886,588	4,440,449	3,533,072
2011	164,233	886,588	4,516,339	3,465,518
2012	57,222	886,588	4,592,229	3,648,419
2013	130,086	886,588	4,668,119	3,651,445
2014	71,775	886,588	4,744,009	3,785,646
2015	6,336	886,588	4,819,899	3,926,975
2016	144,267	886,588	4,895,789	3,864,934
2017		886,588	4,971,678	4,085,091
2018		886,588	5,047,568	4,160,981
2019		886,588	5,123,458	4,236,871
2020		886,588	5,199,348	4,312,761
2021	139,285	886,588	5,275,238	4,249,365
				EIRR = 11.0%
				NPV = -1,100,486

Scenario III: Sensitivity Analysis, Case 2

Investment Cost ±0%, Benefit +10%				Unit: US\$
Investment	O/M Cost	Benefits	Net Benefit	
1999		5,472		-5,472
2000	125,799	16,051		-141,850
2001	8,950,524	103,582		-9,054,106
2002	8,298,094	217,850	1,915,714	-6,600,231
2003	1,437,613	430,147	1,999,094	131,334
2004		560,606	2,082,474	1,521,868
2005		620,974	2,217,609	1,596,635
2006	79,972	671,765	2,566,537	1,814,800
2007		724,032	2,854,196	2,130,164
2008		759,477	3,958,965	3,199,488
2009		802,029	4,780,316	3,978,287
2010	18,900	805,989	4,884,494	4,059,605
2011	149,303	805,989	4,967,973	4,012,681
2012	52,020	805,989	5,051,452	4,193,443
2013	118,260	805,989	5,134,931	4,210,682
2014	65,250	805,989	5,218,410	4,347,171
2015	5,760	805,989	5,301,888	4,490,140
2016	131,152	805,989	5,385,367	4,448,227
2017		805,989	5,468,846	4,662,858
2018		805,989	5,552,325	4,746,336
2019		805,989	5,635,804	4,829,815
2020		805,989	5,719,283	4,913,294
2021	126,623	805,989	5,802,762	4,870,150
				EIRR = 14.2%
				NPV = 2,176,900

Scenario III: Sensitivity Analysis, Case 3

Investment Cost -10%, Benefit ±0%				Unit: US\$
Investment	O/M Cost	Benefits	Net Benefit	
1999		4,925		-4,925
2000	113,219	14,446		-127,665
2001	8,055,472	93,224		-8,148,696
2002	7,468,285	196,065	1,741,558	-5,922,792
2003	1,293,852	387,132	1,817,358	136,374
2004		504,546	1,893,158	1,388,612
2005		558,877	2,016,009	1,457,132
2006	71,975	604,588	2,333,215	1,656,652
2007		651,629	2,594,723	1,943,095
2008		683,529	3,599,059	2,915,530
2009		721,826	4,345,742	3,623,916
2010	17,010	725,390	4,440,449	3,698,049
2011	134,373	725,390	4,516,339	3,656,576
2012	46,818	725,390	4,592,229	3,820,021
2013	106,434	725,390	4,668,119	3,836,295
2014	58,725	725,390	4,744,009	3,959,894
2015	5,184	725,390	4,819,899	4,089,325
2016	118,037	725,390	4,895,789	4,052,362
2017		725,390	4,971,678	4,246,289
2018		725,390	5,047,568	4,322,179
2019		725,390	5,123,458	4,398,068
2020		725,390	5,199,348	4,473,958
2021	113,961	725,390	5,275,238	4,435,888
				EIRR = 14.4%
				NPV = 2,125,642

Scenario III: Sensitivity Analysis, Case 4

Investment Cost ±0%, Benefit -10%				Unit: US\$
Investment	O/M Cost	Benefits	Net Benefit	
1999		5,472		-5,472
2000	125,799	16,051		-141,850
2001	8,950,524	103,582		-9,054,106
2002	8,298,094	217,850	1,567,402	-6,948,542
2003	1,437,613	430,147	1,635,622	-232,138
2004		560,606	1,703,842	1,143,236
2005		620,974	1,814,408	1,193,433
2006	79,972	671,765	2,099,894	1,348,157
2007		724,032	2,335,251	1,611,219
2008		759,477	3,239,153	2,479,676
2009		802,029	3,911,168	3,109,139
2010	18,900	805,989	3,996,404	3,171,515
2011	149,303	805,989	4,064,705	3,109,413
2012	52,020	805,989	4,133,006	3,274,997
2013	118,260	805,989	4,201,307	3,277,058
2014	65,250	805,989	4,269,608	3,398,369
2015	5,760	805,989	4,337,909	3,526,160
2016	131,152	805,989	4,406,210	3,469,069
2017		805,989	4,474,511	3,668,522
2018		805,989	4,542,812	3,736,823
2019		805,989	4,611,112	3,805,124
2020		805,989	4,679,413	3,873,425
2021	126,623	805,989	4,747,714	3,815,103
				EIRR = 10.9%
				NPV = -1,151,744

Table A.5.23 INCOME STATEMENT AND CASH FLOW FOR NWM + C/D CENTERS

Units: US\$

Income Statement	1	2	3	4	5	6	7	8	9	10	11	12
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
A. Revenue												
1) Net income of wholesalers	62,900	103,171	176,165	1,981,238	2,175,231	2,101,500	2,389,449	2,972,508	2,972,508	3,005,877	3,005,877	3,005,877
2) Entering truck charge	11,537	724,414	145,827	167,902	154,081	167,902	167,902	175,780	175,780	175,780	175,780	185,979
3) User fee	82,300	83,400	246,000	453,500	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000
B. Expense												
1) Operation (NWM)	89,300	362,782	928,724	1,195,528	1,248,828	1,407,824	1,477,224	1,559,624	1,559,624	1,559,624	1,559,624	1,559,624
2) Maintenance (NWM)	66,744	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488
3) Depreciation (NWM)	26,641	26,641	26,641	26,641	26,641	26,641	26,641	26,641	26,641	26,641	26,641	26,641
4) Operation & maintenance (C/D centers)	73,100	82,200	288,900	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954
5) Depreciation (C/D centers)	16,200	16,200	73,100	73,100	73,100	73,100	73,100	73,100	73,100	73,100	73,100	73,100
C. Income before Dep. & Interest	-10,600	644,586	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495
D. Net Income	-26,800	446,408	797,441	785,874	785,874	785,874	785,874	785,874	785,874	785,874	785,874	785,874
Cash Flow												
A. Source of Funds												
1) Government (NWM)	138,042	81,612	10,812	2,869,548	1,250,228	1,392,856	1,400,130	1,619,779	1,619,779	1,731,869	1,816,038	1,889,107
2) Government (C/D Centers)		8,152,423		1,090,235	1,623,495							
3) Loan												
4) Own equity												
5) Depreciation (NWM)		16,200	16,200	73,100	73,100	73,100	73,100	73,100	73,100	73,100	73,100	73,100
6) Depreciation (C/D Centers)		-26,800	440,408	797,441	785,874	785,874	785,874	785,874	785,874	785,874	785,874	785,874
7) Net income		138,042	815,243	948,801	1,623,495							
B. Use of Funds												
1) Building (NWM)		8,075,949	8,398,337									
2) Building (C/D Centers)		138,042										
3) Equipment (NWM)			78,454	48,229								
4) Reinvestment (NWM)												
5) Reinvestment (C/D Centers)												
6) Replacement of loss												
C. Net cash flow												
		-10,600	644,586	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495	1,246,495

Income Statement	13	14	15	16	17	18	19	20	21	22	23
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A. Revenue											
1) Net income of wholesalers	3,068,947	3,131,016	3,192,085	3,253,154	3,314,223	3,375,292	3,436,361	3,497,430	3,558,500	3,619,570	3,680,640
2) Entering truck charge	31,274	32,351	33,428	34,504	35,581	36,658	37,734	38,811	39,887	40,964	42,041
3) User fee	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900	1,115,900
B. Expense											
1) Operation (NWM)	1,824,224	1,824,224	1,824,224	1,824,224	1,824,224	1,824,224	1,824,224	1,824,224	1,824,224	1,824,224	1,824,224
2) Maintenance (NWM)	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488
3) Depreciation (NWM)	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282
4) Operation & maintenance (C/D centers)	926,000	926,000	926,000	926,000	926,000	926,000	926,000	926,000	926,000	926,000	926,000
5) Depreciation (C/D centers)	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500
C. Income before Dep. & Interest	1,954,176	2,015,246	2,076,315	2,137,385	2,198,455	2,259,525	2,320,595	2,381,665	2,442,735	2,503,805	2,564,875
D. Net Income	1,444,722	1,505,792	1,566,861	1,627,931	1,689,001	1,750,071	1,811,141	1,872,211	1,933,281	1,994,351	2,055,421
Cash Flow											
A. Source of Funds											
1) Government (NWM)	1,954,176	2,015,246	2,076,315	2,137,385	2,198,455	2,259,525	2,320,595	2,381,665	2,442,735	2,503,805	2,564,875
2) Government (C/D Centers)											
3) Loan											
4) Own equity											
5) Depreciation (NWM)		375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954
6) Depreciation (C/D Centers)		131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500	131,500
7) Net income		3,444,722	3,505,792	3,566,861	3,627,931	3,689,001	3,750,071	3,811,141	3,872,211	3,933,281	3,994,351
B. Use of Funds											
1) Building (NWM)		151,883	151,883	151,883	151,883	151,883	151,883	151,883	151,883	151,883	151,883
2) Building (C/D Centers)											
3) Equipment (NWM)		126,683									
4) Reinvestment (NWM)		25,200	57,900	131,400	78,500	6,400	6,400	6,400	6,400	6,400	6,400
5) Reinvestment (C/D Centers)											
6) Replacement of loss											
C. Net cash flow											
		1,800,293	1,933,446	1,946,935	2,068,884	2,198,055	2,320,633	2,399,663	2,456,733	2,513,803	2,570,873

Remarks:
 1. Operation, maintenance and depreciation during the 1st year of operation of NWM will be approximately half of normal years operation due to phased construction.
 2. Land acquisition, preparation and infrastructure extension costs are not included in building cost of NWM.

**Table A.5.3-24 FINANCIAL EVALUATION OF NWM + C/D CENTERS
- SCENARIO III**

	Investment	Reinvestmt	Income before Depr.	Net Revenue
1999				
2000	138,042			-138,042
2001	8,152,423		-10,600	-8,163,023
2002	9,436,801		644,586	-8,792,215
2003	1,623,493		1,246,495	-376,998
2004			1,293,328	1,293,328
2005			1,392,861	1,392,861
2006		80,010	1,500,130	1,420,120
2007			1,619,799	1,619,799
2008			1,731,869	1,731,869
2009			1,816,038	1,816,038
2010		21,000	1,889,107	1,868,107
2011		151,883	1,952,176	1,800,293
2012		57,800	2,015,246	1,957,446
2013		131,400	2,078,315	1,946,915
2014		72,500	2,141,384	2,068,884
2015		6,400	2,204,453	2,198,053
2016		131,510	2,267,523	2,136,013
2017			2,330,592	2,330,592
2018			2,393,661	2,393,661
2019			2,456,731	2,456,731
2020			2,519,800	2,519,800
2021		126,683	2,582,869	2,456,186
				6.6%
			NPV =	-4,510,889

Table A.5.3-25 FINANCIAL SENSITIVITY ANALYSIS OF NWM + C/D CENTERS - SCENARIO III

Scenario III: Sensitivity Analysis, Case 1

Investment Cost +10%, Revenue ±0%		Unit: US\$	
Investment	Reinvestmt	Income before Depr.	Net Revenue
1999			
2000	151,846		-151,846
2001	8,967,665	-10,600	-8,978,265
2002	10,380,481	644,586	-9,735,896
2003	1,785,842	1,246,495	-539,348
2004		1,293,328	1,293,328
2005		1,392,861	1,392,861
2006	88,011	1,500,130	1,412,119
2007		1,619,799	1,619,799
2008		1,731,869	1,731,869
2009		1,816,038	1,816,038
2010	23,100	1,889,107	1,866,007
2011	167,071	1,952,176	1,785,105
2012	63,580	2,015,246	1,951,666
2013	144,540	2,078,315	1,933,775
2014	79,750	2,141,384	2,061,634
2015	7,040	2,204,453	2,197,413
2016	144,661	2,267,523	2,122,862
2017		2,330,592	2,330,592
2018		2,393,661	2,393,661
2019		2,456,731	2,456,731
2020		2,519,800	2,519,800
2021	139,351	2,582,869	2,443,518
		FIRR =	5.5%
		NPV =	-5,805,758

Scenario III: Sensitivity Analysis, Case 2

Investment Cost ±0%, Revenue +10%		Unit: US\$	
Investment	Reinvestmt	Income before Depr.	Net Revenue
1999			
2000	138,042		-138,042
2001	8,152,423	-9,636	-8,162,059
2002	9,436,801	709,044	-8,727,757
2003	1,623,493	1,371,144	-252,349
2004		1,422,661	1,422,661
2005		1,532,147	1,532,147
2006	80,010	1,650,143	1,570,133
2007		1,781,779	1,781,779
2008		1,905,055	1,905,055
2009		1,997,642	1,997,642
2010	21,000	2,078,018	2,057,018
2011	151,883	2,147,394	1,995,511
2012	57,800	2,216,770	2,158,970
2013	131,400	2,286,146	2,154,746
2014	72,500	2,355,523	2,283,023
2015	6,400	2,424,899	2,418,499
2016	131,510	2,494,275	2,362,765
2017		2,563,651	2,563,651
2018		2,633,027	2,633,027
2019		2,702,404	2,702,404
2020		2,771,780	2,771,780
2021	126,683	2,841,156	2,714,473
		FIRR =	7.7%
		NPV =	-3,665,670

Scenario III: Sensitivity Analysis, Case 3

Investment Cost -10%, Revenue ±0%		Unit: US\$	
Investment	Reinvestmt	Income before Depr.	Net Revenue
1999			
2000	124,238		-124,238
2001	7,337,181	-10,600	-7,347,781
2002	8,493,121	644,586	-7,848,535
2003	1,461,144	1,246,495	-214,649
2004		1,293,328	1,293,328
2005		1,392,861	1,392,861
2006	72,009	1,500,130	1,428,121
2007		1,619,799	1,619,799
2008		1,731,869	1,731,869
2009		1,816,038	1,816,038
2010	18,900	1,889,107	1,870,207
2011	136,695	1,952,176	1,815,482
2012	52,020	2,015,246	1,963,226
2013	118,260	2,078,315	1,960,055
2014	65,250	2,141,384	2,076,134
2015	5,760	2,204,453	2,198,693
2016	118,359	2,267,523	2,149,164
2017		2,330,592	2,330,592
2018		2,393,661	2,393,661
2019		2,456,731	2,456,731
2020		2,519,800	2,519,800
2021	114,015	2,582,869	2,468,854
		FIRR =	7.8%
		NPV =	-3,216,019

Scenario III: Sensitivity Analysis, Case 4

Investment Cost ±0%, Revenue -10%		Unit: US\$	
Investment	Reinvestmt	Income before Depr.	Net Revenue
1999			
2000	138,042		-138,042
2001	8,152,423	-11,778	-8,164,201
2002	9,436,801	580,127	-8,856,674
2003	1,623,493	1,121,845	-501,648
2004		1,163,995	1,163,995
2005		1,253,575	1,253,575
2006	80,010	1,350,117	1,270,107
2007		1,457,819	1,457,819
2008		1,558,682	1,558,682
2009		1,634,434	1,634,434
2010	21,000	1,700,196	1,679,196
2011	151,883	1,756,959	1,605,076
2012	57,800	1,813,721	1,755,921
2013	131,400	1,870,483	1,739,083
2014	72,500	1,927,246	1,854,746
2015	6,400	1,984,008	1,977,608
2016	131,510	2,040,770	1,909,260
2017		2,097,533	2,097,533
2018		2,154,295	2,154,295
2019		2,211,057	2,211,057
2020		2,267,820	2,267,820
2021	126,683	2,324,582	2,197,899
		FIRR =	5.4%
		NPV =	-5,356,259

Table A.5.3-26 INCOME STATEMENT, CASH FLOW, AND FIRR OF PRIVATIZED WHOLESALERS' SECTION

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
I Income Statement														
A. Revenue	372,963	657,174	658,651	660,128	662,281	664,434	666,587	668,741	670,894	673,047	675,200	677,354	679,507	681,660
1) Rental fee of space	305,249	610,498	610,498	610,498	610,498	610,498	610,498	610,498	610,498	610,498	610,498	610,498	610,498	610,498
2) Entering truck charge	22,714	46,675	48,152	49,629	51,103	52,576	54,049	55,522	56,995	58,468	59,941	61,414	62,887	64,360
B. Expense	663,914	947,276	947,276	947,276	947,276	947,276	947,276	947,276	947,276	947,276	947,276	947,276	947,276	947,276
1) Operation	66,744	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488	133,488
2) Maintenance	28,641	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282	57,282
3) Depreciation	187,977	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954	375,954
4) Interest	380,552	380,552	380,552	380,552	380,552	380,552	380,552	380,552	380,552	380,552	380,552	380,552	380,552	380,552
C. Income before Depr. & Interest	232,578	466,403	466,403	466,403	466,403	466,403	466,403	466,403	466,403	466,403	466,403	466,403	466,403	466,403
D. Net Income	335,951	-290,102	-288,625	-287,148	-285,671	-284,194	-282,717	-281,240	-279,763	-278,286	-276,809	-275,332	-273,855	-272,378
II Cash Flow														
A. Source of Funds	2,700,000	-147,972	85,852	87,329	88,806	90,283	91,759	93,236	94,713	96,190	97,667	99,144	100,621	102,098
1) Government														
2) Loan														
3) Own equity														
4) Depreciation														
5) Net income														
B. Uses of Funds	2,700,000	18,219	18,219	20,678	23,470	26,638	30,234	34,316	38,948	44,206	50,174	56,948	64,636	73,361
1) Building														
2) Equipment														
3) Reinvestment														
4) Repayment of loan														
C. Net cash flow														

	2015	2016	2017	2018	2019	2020	2021
I Income Statement							
A. Revenue	681,660	683,813	685,967	688,120	690,273	692,426	694,579
1) Rental fee of space	610,498	610,498	610,498	610,498	610,498	610,498	610,498
2) Entering truck charge	71,162	73,315	75,468	77,622	79,775	81,928	84,081
B. Expense	947,276	947,276	947,276	947,276	947,276	947,276	947,276
1) Operation	133,488	133,488	133,488	133,488	133,488	133,488	133,488
2) Maintenance	57,282	57,282	57,282	57,282	57,282	57,282	57,282
3) Depreciation	375,954	375,954	375,954	375,954	375,954	375,954	375,954
4) Interest	380,552	380,552	380,552	380,552	380,552	380,552	380,552
C. Income before Depr. & Interest	490,890	493,043	495,196	497,350	499,503	501,656	503,809
D. Net Income	-265,616	-263,463	-261,309	-259,156	-257,003	-254,850	-252,696
II Cash Flow							
A. Source of Funds	110,338	112,492	114,645	116,798	118,951	121,105	123,258
1) Government							
2) Loan							
3) Own equity							
4) Depreciation							
5) Net income							
B. Uses of Funds	83,265	94,506	107,264	121,745	138,180	156,855	178,008
1) Building							
2) Equipment							
3) Reinvestment							
4) Repayment of loan							
C. Net cash flow	27,073	17,986	7,381	-4,947	-19,229	-35,750	-54,750

FIRR of Privatized Wholesalers' Section

Year	Investment	Reinvestment	Income before Net Revenue	Unit: US\$
2001	2,700,000			
2002			232,578	
2003			466,403	
2004			467,881	
2005			469,358	
2006			471,511	
2007			473,664	
2008			475,817	
2009			477,971	
2010			480,124	
2011			482,277	
2012			484,430	
2013			486,583	
2014			488,737	
2015			490,890	
2016			493,043	
2017			495,196	
2018			497,350	
2019			499,503	
2020			501,656	
2021			503,809	
			FIRR =	15.4%
			NPV =	566,305

Remarks:

- Private developer to build the new wholesale market hall no.1 by own loan. Construction cost reduced by 50%.
- Market space rental charge increased 2 times to B&S/day. Participation in MERCOSUR may improve economic situation for wholesalers to be able to pay this charge.
- Entering truck charge increased 2 times. Participation in MERCOSUR may increase handling volume of import and export to enable truckers to pay this charge.
- Revenue, operation, maintenance and depreciation during the 1st year of operation will be approximately half of normal years operation.
- Loan at 13.5% interest rate for 25 years with no grace period.

Table A.5.4-1 Organizations Providing Agriculture Credit in Valley Areas

Province	Organizations
Florida	ASOFRUT, PRECONAT, Saving & Credit Cooperatives, PDA (NGO)
Caballero	ASOFRUT, Saving & Credit Cooperatives, EMCA(NGO), ICO (NGO)
Vallegrande	ICO, Saving & Credit Cooperatives

Remark:

1) PRECONAT: Programa Ecologia y Naturaleza; ICO: Instituto de Capacitacion del Oriente

2) PDA: Proyecto Desarrollo Agropecuario

Table A.5.4-2 Terms & Conditions of Agriculture Credit in Valley Areas

Organization	Target Groups for Credit	Terms & Conditions
ASOFRUT	Member of organization	farming purpose, maximum US\$2,000, period 12 - 24 months, interest 12%
SAVING & CREDIT COOPERATIVES	Member of cooperatives	any purpose, maximum US\$10,000, period 3 years, interest > 20%
ICO	Caballero & Vallegrande	farming purpose, 450 beneficiaries
EMCA	Member of organization	farm inputs supply

Table A.5.4-3 Summary of Possible Fund Source for Collection Center

Financial Institution	Loan Conditions / Guarantee	Interest (% per annum)	Credit Limit US\$	Grace Period (Year)	Objective of Credit
FINDESA	Guarantee 3 times value of loan	16	50,000	1	Small and large scale producers
Banco Ganadero	Ranching	16	-	2	Ranchers
FDC	Projects with Social & economic benefits	-	-	-	Rural communities with fewer than 5,000 inhabitants
Cooperativa de Ahorro y Credito	For members. Land/house + Another Guarantor	20	3,000	-	Small - medium producers
BOLINVEST	Acts as technical "guarantor"	-	-	-	To promote commercialization, export, and foreign investment
FONDECO	Land title & group guarantor	15-24	2,000	-	Non-profit organization to assist poor population both in rural & urban settings
ASOFRUT	Land / house title & group guarantor	12	1,000/Ha	-	Production, planting and plant/seed production

Table A.5.5-5 Environmental Impact Assessment - Abasto Market without wholesale function

Activity	Potential Impact	Classification	Countermeasures to be Considered
<p>MARKETING ACTIVITIES, OPERATION / MAINTENANCE</p> <p>Reduced Traffic / Vehicle movements</p>	<ul style="list-style-type: none"> - Impact on physiological system in terms of reduced traffic flow to the area, thereby improving the congestion problem, reduce noise, dust, and improve safety condition to local inhabitants. 	T, D, Lc, B, R	<p>Effective use of vacant car park and market space should be examined by the urban planning and market management authorities.</p>
<p>Reduced solid waste collection</p>	<ul style="list-style-type: none"> - Solid waste volume will reduce by about 50% due to relocation of wholesale volume to the new wholesale market. This will impact on the general cleanliness and sanitation of the market. 	T, D, Lc, B, R	<p>Greater number of rubbish containers could be provided for better handling and disposal of the solid waste.</p>
<p>Reduced market wholesale activities - loading / unloading, parking/waiting, packing/sorting, sales of products</p>	<p>These reduced activities will impact on the life-style of the users and beneficiaries of the market.</p> <ul style="list-style-type: none"> - Negative impact will be on the porters and car park attendants who will suffer reduced income with the relocation of wholesale function. - Positive impact will be on wholesalers, transporters, retailers, intermediaries and consumers. 	T, D, Lc, A, R	<ul style="list-style-type: none"> - Opportunities should be given to the porters in Abasto market to participate in the New Wholesale Market. Alternative use of car park space such as for taxi, bus, consumers' car, etc. - Equitable access and opportunity to participate in the NWM for the wholesalers, intermediaries, retailers, and transporters, must be assured.
<p>FUTURE INDUCE EFFECTS</p>	<ul style="list-style-type: none"> - Relocation of the wholesale function will improve the value of the surrounding land around Abasto as noise, congestion, and traffic are reduced creating a more pleasant environment. - New opportunities for retailers and intermediaries as space become available with relocation of wholesale function. 	P, I, Lc, B	<p>Future development of Abasto market should be controlled so that its operation does not adversely impact on the surrounding areas especially in light of the tight space constrain and high population in the area.</p>
<p>- Promote related activities</p>		P, I, Lc, B, R	<p>Future development of the Abasto market will need to be considered by the urban planning authorities to conform to the development plans of the city.</p>

Legend:
 T = Temporary impact
 Lc = Local impact
 Note on Classification:
 Impact that is Significant, will be further classified into Reversible or Irreversible impacts.

R = Reversible Ir = Irreversible

I = Indirect impact
 B = Beneficial impact
 D = Direct impact
 A = Adverse impact

Table A.5.5-6 Water Quality Analysis at New Wholesale Market site

PROJECT : Los Valles - Santa Cruz SAMPLING SITE : Santa Cruz
 OWNER : Study Team - Jica SAMPLE : Water
 DATE : Dic. 05 - 1998

N°	PARAMETERS	UNIT	METHOD	LIMITS OF DETECTION	SITE ZAPU - District 10		
					SAMPLE		
					1	2	3
1	Calcium	mg/l	Photometric (3500 - CaB)	1.00			
2	Residual Chlorine	mg/l	Titulation (4500 - Cl B)	0.001	0.14	0.34	
3	Copper	mg/l	Phenol Salt Fotometer (3500 - Cu B)	0.01			
4	Faecal Coliforms	NMP/100 ml	Múltiple Test Tube Fermentation (9221 - C)	3.00	0.00E +00	0.00E +00	0.00E +02
5	Total Coliformes	NMP/100 ml	Múltiple Test Tube Fermentation (9221 - B)	3.00	0.00E +00	0.00E +00	0.00E +02
6	Especific Conductivity	umhos/cm	Conductivimeter (2510 - B)	0.05	289.00	196.00	266.00
7	Chlorine Demand	mg/l	Iodometric (4500 - Cl- B)	1.00	0.35	0.28	0.44
8	DQO	mg/l	Chrome-sulfuric Oxidation (5520-C)	2.00			
9	Total Hardness	mg/l	Titulation (2340 - C)	1.00	119.20	130.00	266.00
10	Fluorics	mg/l	Colorimetry (4500 F - D)	0.10			
11	Airon	mg/l	Fenantrolina Colorimetry (3500 - Fe D)	0.01			
12	Magnesium	mg/l	Calculus (3500 - Mg B)	0.20			
13	Manganese	mg/l	Persulphate (3500 - Mn D)	0.04			
14	Total Nitrogen c. NO ₃	mg/l	Digestion - Kjeldahl (4500 - Norg. C)	2.00			
15	Solved Oxygen	mg/l	Membrane Electrode (4500 - O G)	0.10	4.00	5.80	3.80
16	pH	adimension.	Electrometric (4500 - H ⁺ B)	1.00 - 13.00	7.03	7.12	7.30
17	Muddiness	mg/l	Nephelometric	0.01	0.29	0.21	0.26
18	Solved Solids at 110 °C	mg/l	Gravimetry (2540 - C)	1.00	156.00	115.00	159.00
19	Temperature	°C	Termometer (2540 - B)	- 10 a 150	27.00	26.00	26.00

Table A.5.5-7 Environmental Impact Assessment - New Wholesale Market - 1/2

Activity	Potential Impact	Classification	Countermeasures to be Considered
EXECUTION / CONSTRUCTION STAGE			
Land Preparation, Site clearing / tree cutting	- Stripping of existing vegetation and some trees	T, D, Lc, A	To replant trees and other landscaping work after construction completed.
Infrastructure Preparation, Excavation (Cut and Fill)	- Removal of some soil - Importing of soil to use as fill	T, D, Lc, A	Unwanted or unsuitable excavated soil should be disposed off in a proper place.
Demolition / Relocation	- Brick factories to be demolished and activities to be relocated elsewhere.	T, D, Lc, A	Compensation for the demolition and relocation must be acceptable to the owners.
Infrastructure / Superstructure Construction	- Construction activities on site will create noise, dust, and increase construction traffic on road	T, D, Lc, A	Construction activities should be restricted to working hours and construction plant traffic should be cautioned to travel at low speed especially passing through populated areas.
Utilities, Temporary services (water, electricity, telephone) supply	- Construction activities will make use of water & electricity supply on the site	T, D, Lc, A	Capacity of existing water & electricity supply to be investigated by the contractor to ensure that these services are adequate and will not disrupt the supply to the surrounding areas of the project site.
Employment - Construction labour force	- labour force will create demand for services (transport, restaurant, etc.) at the site	T, D, Lc, B, R	Encourage the contractor to hire local labourers from the community.
Scenery - Landscaping	- landscaping of the site will seek to improve the scenery and reduce the vision impact of the structures.	P, D, Lc, B, R	Encourage the planting of hardy trees and plants suitable for the local environment.
MARKETING ACTIVITIES, OPERATION / MAINTENANCE			
Traffic / Vehicle movements	- Impact on physiological system in terms of increase traffic flow to the area creating noise, dust, and increase safety hazard to local inhabitants.	T, D, Lc, A, R	Dedicated road to the project site will minimize the impact on the local residents. Traffic control (traffic lights, overpass, etc.) should be considered by urban planning authorities to ensure smooth integration of traffic into main trunk road.
Solid waste collection	- Solid waste if not properly handled may cause bad odour, pollution, breed rodents and vectors, and create a health hazard	T, D, Lc, B, R	Project to provide proper facilities to handle the solid waste. Coordination with the Municipality on waste collection system to be arranged together with the micro-enterprise contracted to collect the waste for disposal at municipal landfill.
Surface water drainage, cleaning / washing water discharge	- The surface water if not properly handled may cause flooding and erosion on the site and surrounding areas.	P, D, Lc, A, R	Project design to incorporate waste separation and proper discharge of surface water to the water drainage system running underneath the road.
Sewage treatment & discharge	- Major pollutants such as suspended solids, BODs, fecal coliforms, etc. will cause pollution, contamination of ground water, and health problems if not properly treated / handled.	P, D, Lc, A, R	Project to provide sewage treatment facilities to meet the require permissible discharge standards of the Environmental law and regulation.

Table A.5.5-7 Environmental Impact Assessment - New Wholesale Market - 2/2

Activity	Potential Impact	Classification	Countermeasures to be Considered
Market activities - loading / unloading, parking/waiting, packing/sorting, sales of products Maintenance activities of equipment, facilities / building	- These activities will create new jobs and opportunities in the market and surrounding area. These activities will impact on the life-style of the users and beneficiaries of the market.	T, D, Lc, B, R	Opportunities should be given to local inhabitants and people affected (eg. porters in Abasto market) by the relocation of wholesale function.
FUTURE INDUCE EFFECTS			
- Value of the surrounding land	- The location of the project in the sub-urban / rural location will improve the value of the surrounding land. Future value of the land will depend on the future development in the area.	P, I, Lc, B	Land for the project should include enough space for future expansion so that future increase of surrounding land value will not affect the project's expansion plans.
- Promote related activities nearby	- Operation of the market will impact indirectly on the surrounding commerce/ activities of the area. Related businesses such as storage, warehouse, workshops, etc. will start up in future creating new job opportunities.	P, I, Lc, B, R	Future development of the area surrounding the market will need to be considered by the urban planning authorities to conform to the development plans of the city.
ABANDONMENT			
- Notice to close	- This will impact on the jobs and surrounding business associated with the market. Closure of the market will also impact on the value of the land in the area.	P, D, Lc, A, R	In case of closure, alternative use of the facilities must be found to lessen the impact of the closure on the area and people associated with the market.
EXTENSION ACTIVITIES			
- Training / education	- Knowledge empowerment will impact on behavioral changes that may lead to improved quality of life.	P, I, St, B, R	Equity of access to be assured by the user group.

Legend:

- T = Temporary impact
- Lc = Local impact
- P = Permanent impact
- St = Strategic impact

Note on Classification:

Impact that is Significant, will be further classified into Reversible or Irreversible impacts.

- I = Indirect impact
- B = Beneficial impact

- R = Reversible
- Ir = Irreversible

Table A.5.5-8 Water Quality Analysis at Saipina site

PROJECT : Los Valles - Santa Cruz

SAMPLING SITE : Los Valles

OWNER : Study Team - Jica

SAMPLE : Water

DATE : Nov. 30 - 1998

N°	PARAMETERS	UNIT	METHOD	LIMITS OF DETECTION	SITE SAIPINA		
					SAMPLE		
					POLICE TAP	RIO CHILON	RIO GRANDE
1	Calcium	mg/l	Photometric (3500 - CaB)	1.00	31.20	28.80	53.60
2	Chlorine	mg/l	Titulation (4500 - Cl B)	0.04	< 0.04	< 0.04	< 0.04
3	Copper	mg/l	Phenol Salt Fotometer (3500 - Cu B)	0.01	< 0.01	0.22	0.09
4	Faecal Coliforms	NMP/100 ml	Multiple Tube Fermentation (9221 - C)	3.00	4.30 E + 05	2.30 E + 04	4.30 E + 05
5	Total Coliformes	NMP/100 ml	Multiple Tube Fermentation (9221 - B)	3.00	1.50 E + 07	4.30 E + 04	1.50 E + 07
6	Especific Conductivity	mg/l	Conductivimeter	0.05	568.00	395.00	550.00
7	Total DBO ₅	mg/l	Dilution and Photometric (5210 - B)	1.00	< 1.00	4.17	450.00
8	DQO	mg/l	Chrome-sulfuric Oxidation (5520-C)	2.00	< 2.00	11.30	685.00
9	Total Hardness	mg/l	Titulation (2340 - C)	1.00	139.20	132.80	279.20
10	Fluorics	mg/l	Colorimetry (4500 F - D)	0.10	1.12	0.50	0.48
11	Airon	mg/l	Fenantroline Colorimetry (3500 - Fe D)	0.01	1.50	0.09	0.72
12	Magnesium	mg/l	Calculus (3500 - Mg B)	0.20	14.87	14.77	35.28
13	Manganese	mg/l	Persulphate (3500 - Mn D)	0.04	< 0.042	0.05	< 0.042
14	Total Nitrogen c. NO ₃	mg/l	Digestion - Kjeldahl (4500 - Norg. C)	2.00	48.40	35.04	155.32
15	Dissolved Oxygen	mg/l	Membrane Electrode (4500 - O G)	0.10	7.24	6.10	6.60
16	pH	adimension.	Electrometric (4500 - H' B)	1.00 - 13.00	2.80	8.32	7.33
17	Total Solids at 110 °C	mg/l	Gravimetry (2540 - B)	1.00	625.00	623.00	8,455.00
18	Total Suspended Solids at 110 °C	mg/l	Gravimetry (2540 - C)	1.00	143.00	346.00	7,572.00
19	Temperature	°C	Termometer (2540 - B)	- 10 a 150	23.50	23.50	23.60

Table A.5.5-9 Water Quality Analysis at Pampa Grande site

PROJECT : Los Valles - Santa Cruz SAMPLING SITE : Los Valles
 OWNER : Study Team - Jica SAMPLE : Water
 DATE : Nov. 30 - 1998

N°	PARAMETERS	UNIT	METHOD	LIMITS OF DETECTION	SITE PAMPA GRANDE		
					SAMPLE		
					CITY TAP	RIO LOS NEGROS	RIO SECO
1	Calcium	mg/l	Photometric (3500 - CaB)	1.00	48.64	28.80	58.30
2	Chlorine	mg/l	Titulation (4500 - Cl B)	0.04	0.05	< 0.04	< 0.04
3	Copper	mg/l	Phenol Salt Fotometer (3500 - Cu B)	0.01	0.04	0.22	0.08
4	Faecal Coliforms	NMP/100 ml	Múltiple Tube Fermentation (9221 - C)	3.00	0.00 E + 00	2.30 E + 04	4.30 E + 05
5	Total Coliforms	NMP/100 ml	Múltiple Tube Fermentation (9221 - B)	3.00	0.00 E + 01	4.30 E + 04	1.50 E + 08
6	Especific Conductvity	mg/l	Conductivimeter	0.05	888.00	395.00	600.00
7	Total DBO ₅	mg/l	Dilution and Photometric (5210 - B)	1.00	5.89	4.17	420.00
8	DQO	mg/l	Chrome-sulfuric Oxidation (5520-C)	2.00	13.40	11.30	600.00
9	Total Hardness	mg/l	Titulation (2340 - C)	1.00	183.20	132.80	280.00
10	Fluorica	mg/l	Colorimetry (4500 F - D)	0.10	0.74	0.50	0.48
11	Airon	mg/l	Fenantrolina Colorimetry (3500 - Fe D)	0.01	0.04	0.09	0.60
12	Magnesium	mg/l	Calculus (3500 - Mg B)	0.20	14.98	14.77	38.50
13	Manganese	mg/l	Persulphate (3500 - Mn D)	0.04	< 0.042	0.05	< 0.042
14	Total Nitrogen c. NO ₃	mg/l	Digestion - Kjeldahl (4500 - Norg. C)	2.00	31.72	35.04	181.20
15	Dissolved Oxygen	mg/l	Membrane Electrode (4500 - O G)	0.10	5.30	6.10	6.60
16	pH	adimension.	Electrometric (4500 - H ⁺ B)	1.00 - 13.00	7.68	8.32	7.98
17	Total Solids at 110 °C	mg/l	Gravimetry (2540 - B)	1.00	832.00	623.00	8,535.00
18	Total Suspended Solids at 110 °C	mg/l	Gravimetry (2540 - C)	1.00	166.00	348.00	7,642.00
19	Temperature	°C	Termometer (2540 - B)	- 10 a 150	28.50	23.50	24.10

Table A.5.5-10 Environmental Impact Assessment - Collection / Distribution Center (Rehabilitation & New Construction) - 1/2

Activity	Potential Impact	Classification	Countermeasures to be Considered
EXECUTION / CONSTRUCTION STAGE			
Land Preparation, Site clearing / tree cutting	- Stripping of existing vegetation and some trees	T, D, Lc, A	To replant trees and other landscaping work after construction completed.
Infrastructure Preparation. Excavation (Cut and Fill)	- Removal of some soil - Importing of soil to use as fill	T, D, Lc, A	Unwanted or unsuitable excavated soil should be disposed off in a proper place.
Infrastructure / Superstructure Rehabilitation / Construction	- Construction activities on site will create noise, dust, and increase construction traffic on road	T, D, Lc, A	Construction activities should be restricted to working hours and construction plant traffic should be cautioned to travel at low speed especially passing through populated areas.
Utilities, Temporary services (water, electricity, telephone) supply	- Construction activities will make use of water & electricity supply on the site	T, D, Lc, A	Capacity of existing water & electricity supply to be investigated by the contractor to ensure that these services are adequate and will not disrupt the supply to the surrounding areas of the project site.
Employment - Construction labour force	- labour force will create demand for services (transport, restaurant, etc.) at the site	T, D, Lc, B, R	Encourage the contractor to hire local labourers from the community.
Scenery - Landscaping	- landscaping of the site will seek to improve the scenery and reduce the vision impact of the structures.	P, D, Lc, B, R	Encourage the planting of hardy trees and plants suitable for the local environment
MARKETING ACTIVITIES, OPERATION / MAINTENANCE			
Traffic / Vehicle movements	- Impact on physiological system in terms of increase traffic flow to the area creating noise, and dust.	T, D, Lc, A, R	Low number / frequency of traffic will not require new traffic control requirements.
Solid waste	- Solid waste if not properly handled may cause bad odour, pollution, breed rodents and vectors, and create a health hazard	T, D, Lc, A	Solid waste will be minimal and majority will be organic in nature which could be recycled into compost for use on the farm. Project to provide proper facilities to handle the solid waste..
Sewage discharge	- Major pollutants such as suspended solids, BODs, fecal coliforms, etc. will cause pollution, contamination of ground water, and health problems if not properly treated / handled.	P, D, Lc, A	Sewage discharge will be minimal due to small number of users. Project to provide septic tank to handle the sewage.
Market activities - loading / unloading, parking/waiting, packing/sorting, sales of products	- These activities will create new jobs and opportunities in the market and surrounding area. These activities will impact on the life-style and communal needs of the users.	T, D, Lc, B, R	Opportunities should be given to local inhabitants and people affected (eg. porters in Abasto market) by the relocation of wholesale function.
Maintenance activities of equipment, facilities / building			

Table A.5.5-10 Environmental Impact Assessment - Collection / Distribution Center (Rehabilitation & New Construction) - 2/2

Activity	Potential Impact	Classification	Countermeasures to be Considered
FUTURE INDUCE EFFECTS			
- Promote related activities nearby	- Operation of the center will impact indirectly on the surrounding commerce/ activities of the area in future creating new job opportunities.	P, I, Lc, B, R	Future development of the area surrounding the center will need to be considered by the municipalities.
ABANDONMENT			
- Notice to close	- This will impact on the jobs and surrounding business associated with the center.	P, D, Lc, A, R	In case of closure, alternative use of the facilities must be found to lessen the impact of the closure on the area and people associated with the center.
EXTENSION ACTIVITIES			
- Training / education	- Knowledge empowerment will impact on behavioral changes that may lead to improved quality of life. Impact on the increase in production and commercialization will also improve the economic situation of the farmers	P, I, St, B, R	Equity of access to be assured by the user group and management body of the center.

Legend:

T = Temporary impact
 Lc = Local impact
 St = Strategic impact

Note on Classification:

Impact that is Significant, will be further classified into Reversible or Irreversible impacts.

I = Indirect impact
 B = Beneficial impact

D = Direct impact
 A = Adverse impact

R = Reversible
 I r = Irreversible