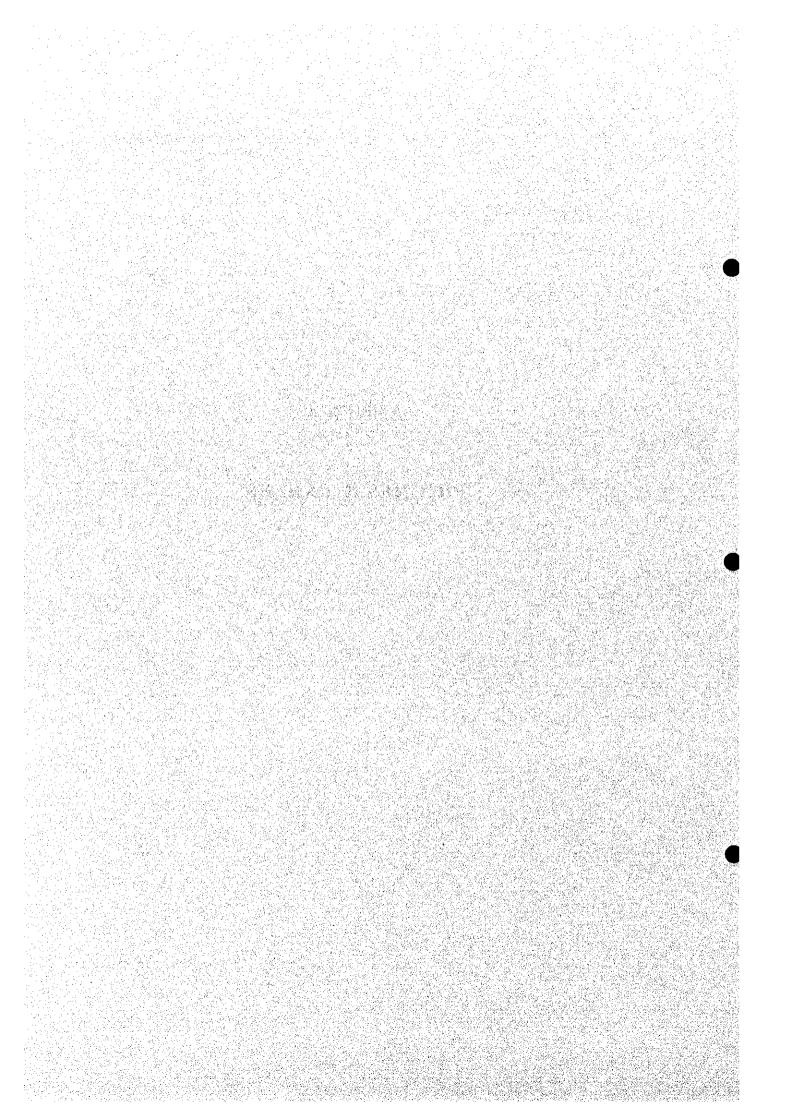
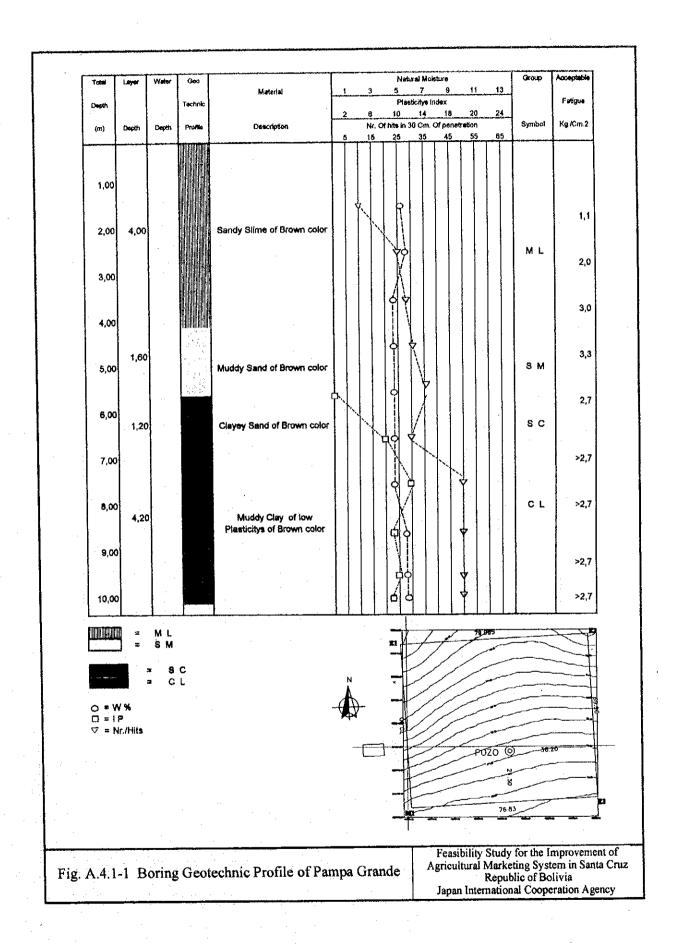
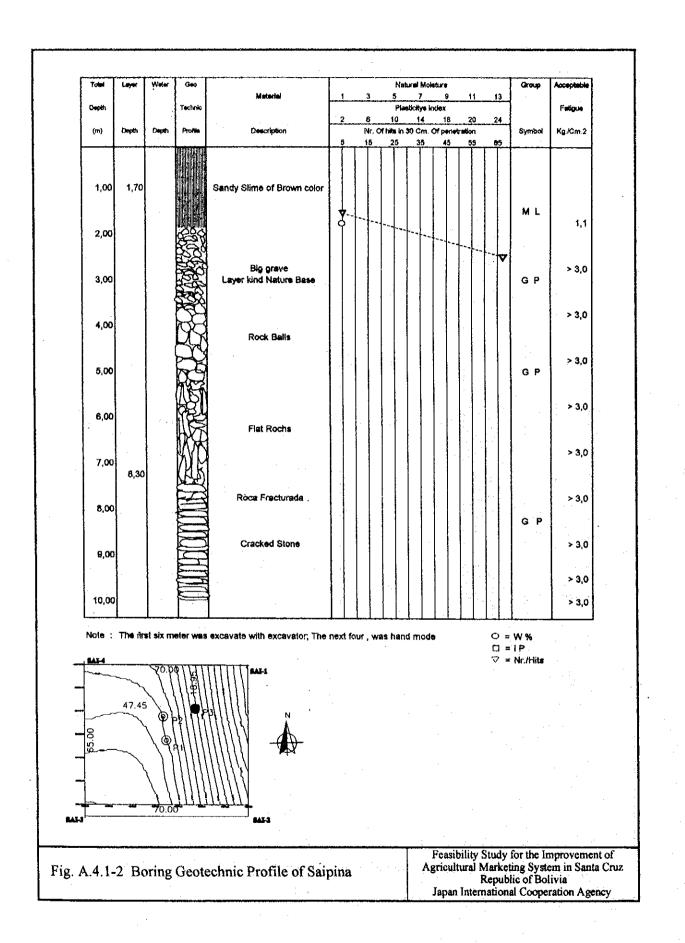
Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz

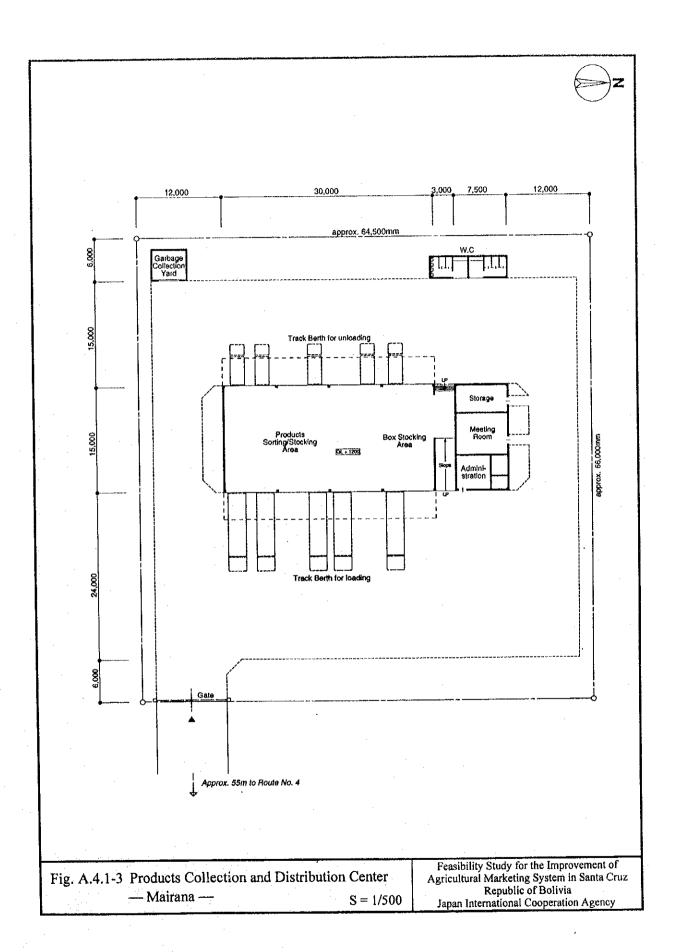
# ANNEX 4

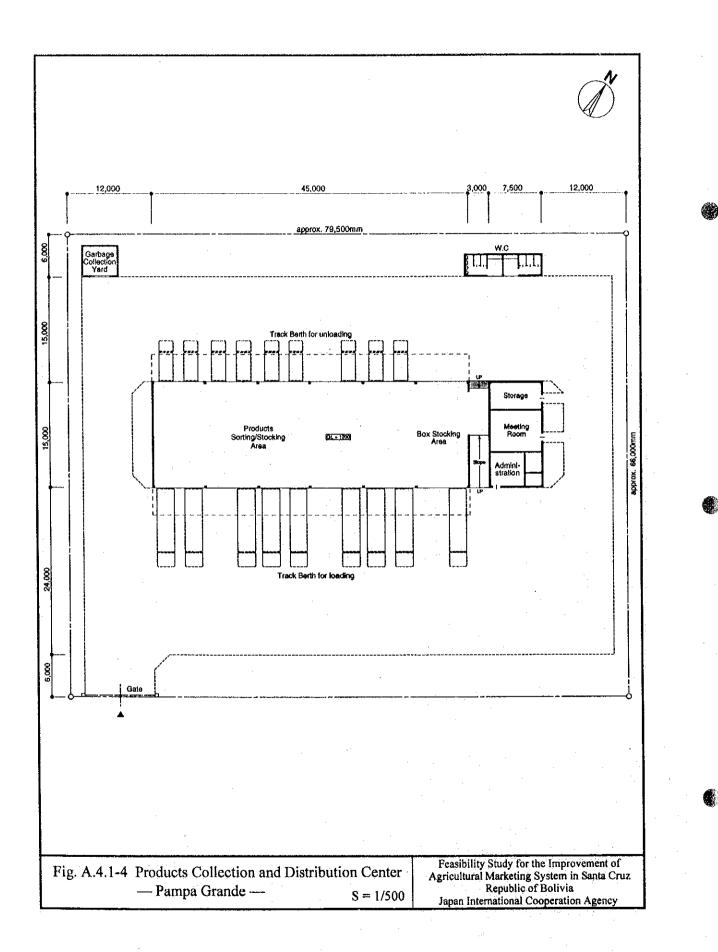
# FIGURES & TABLES

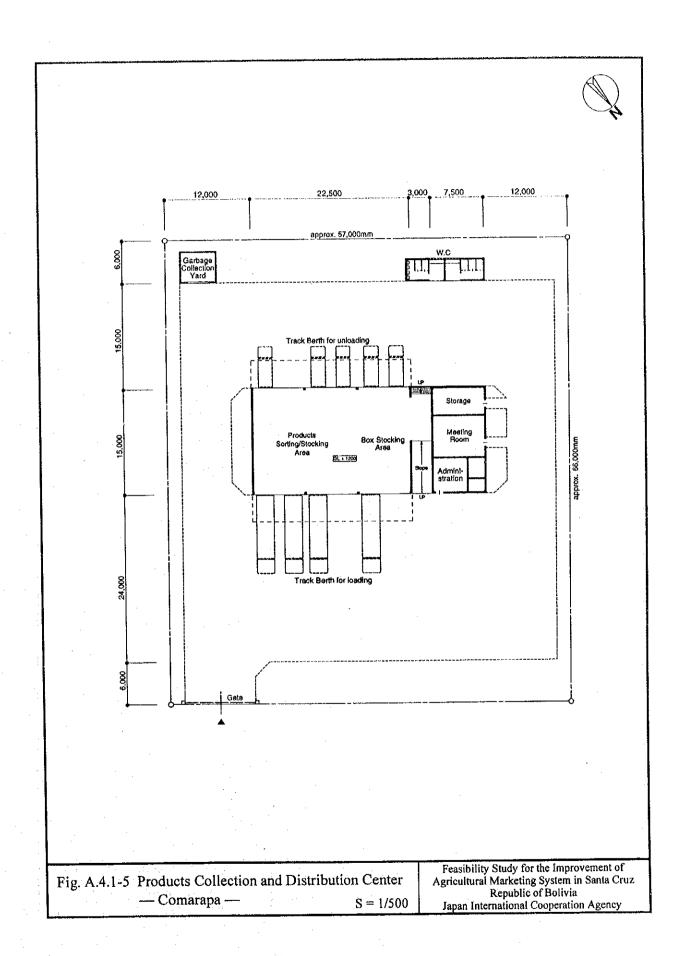


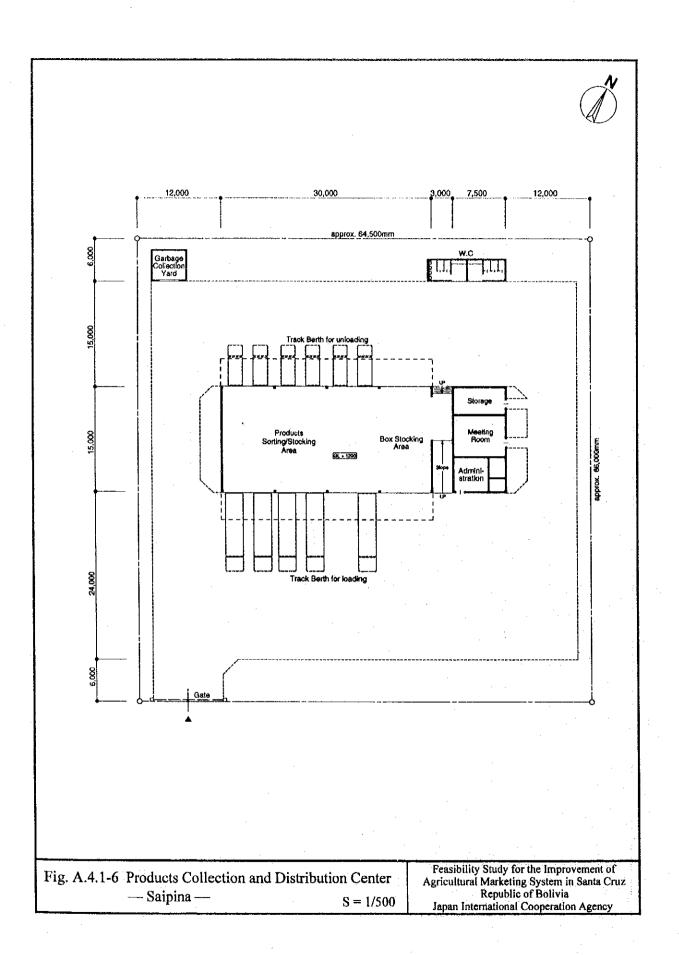


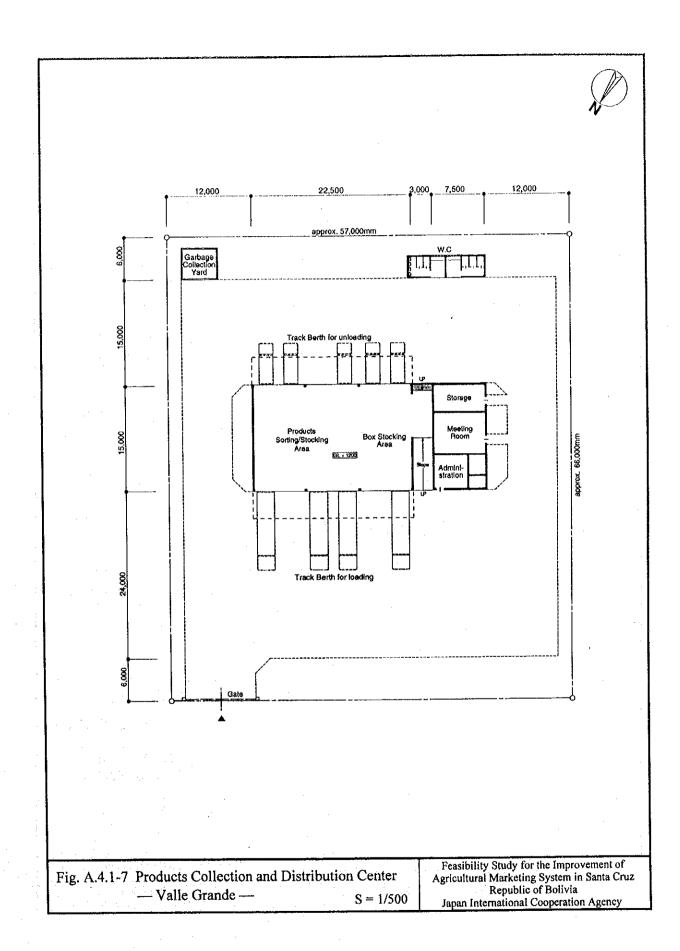


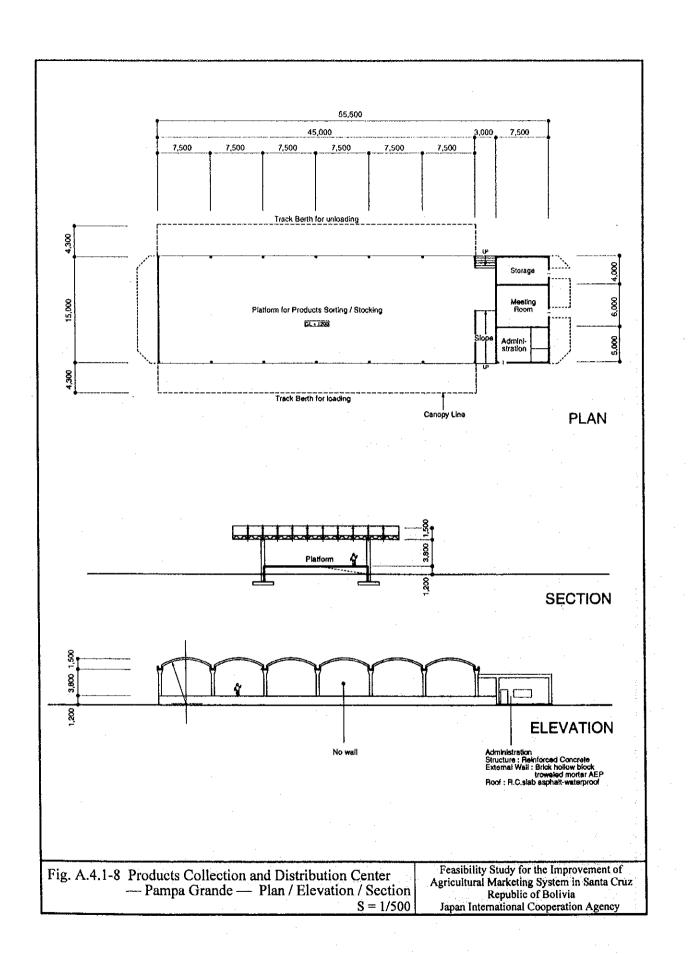




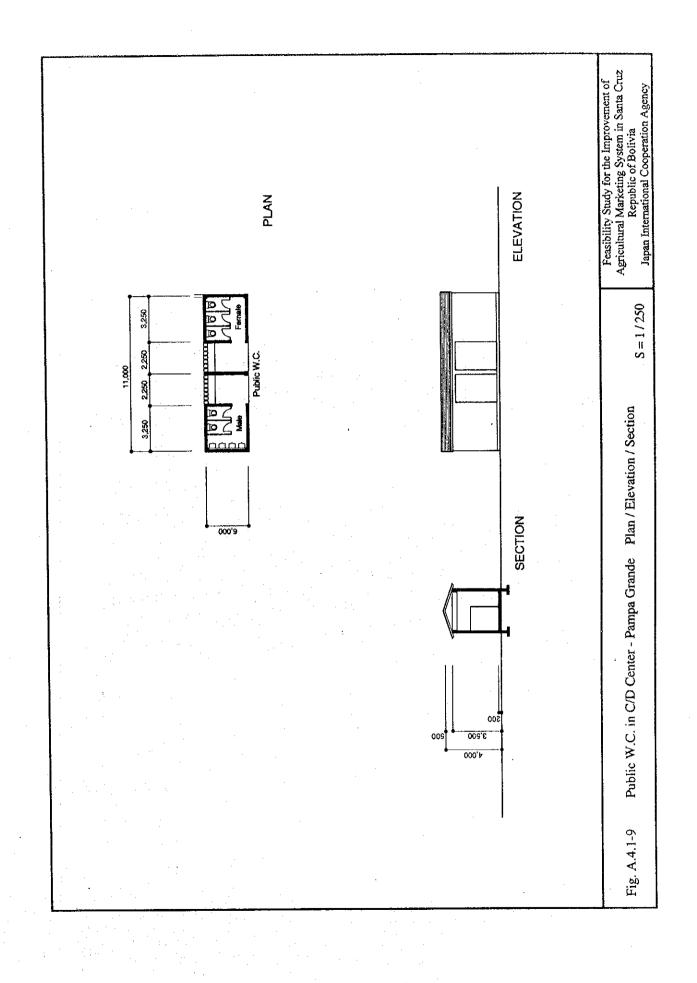




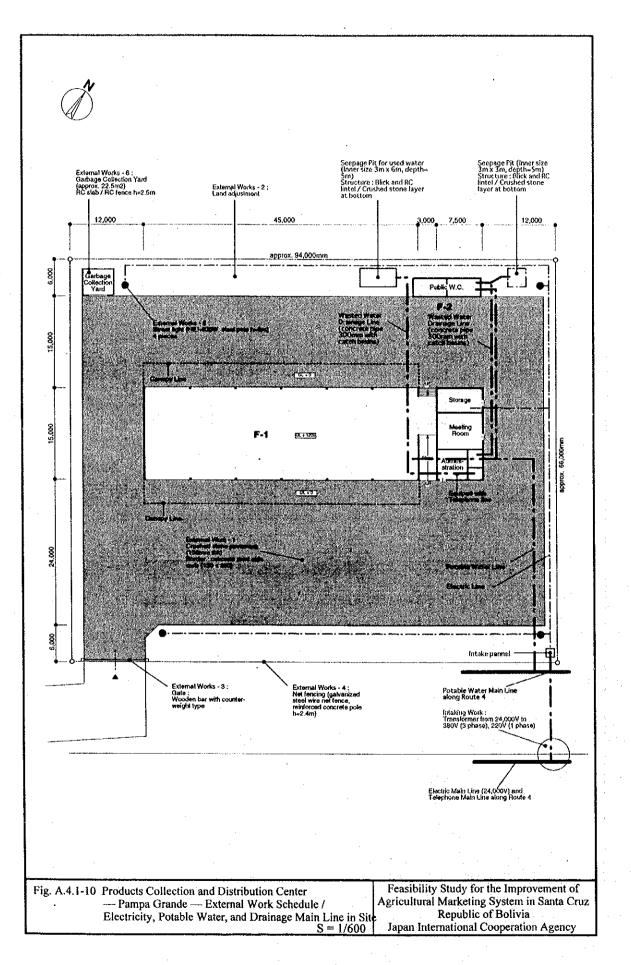




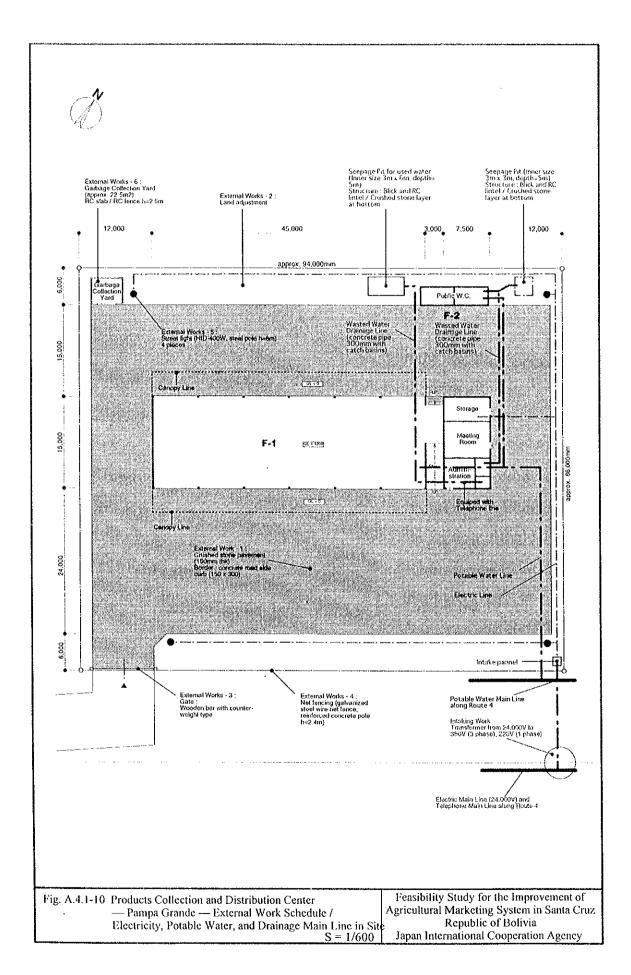
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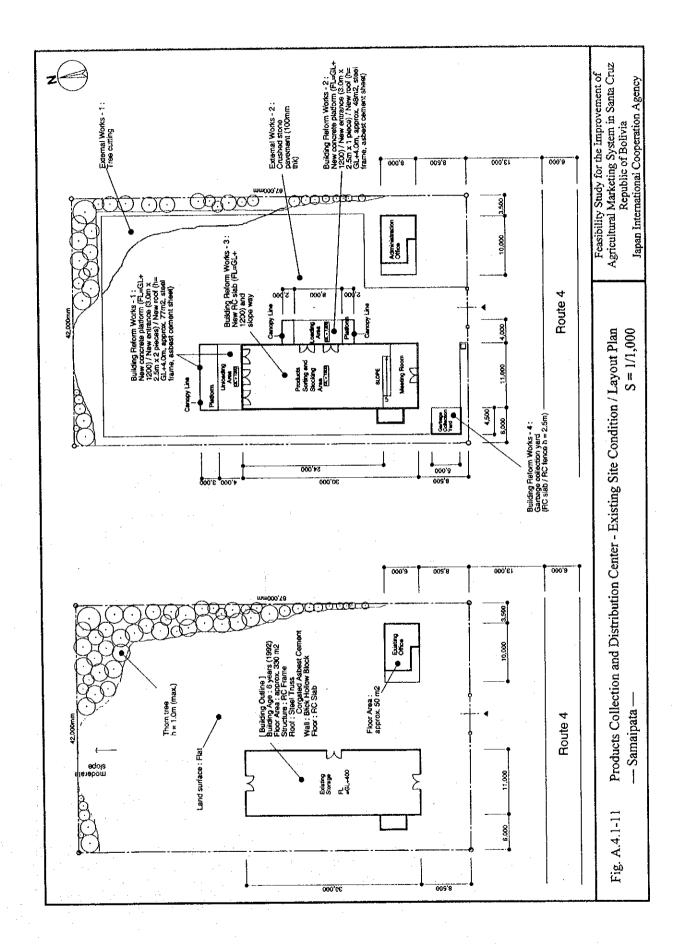


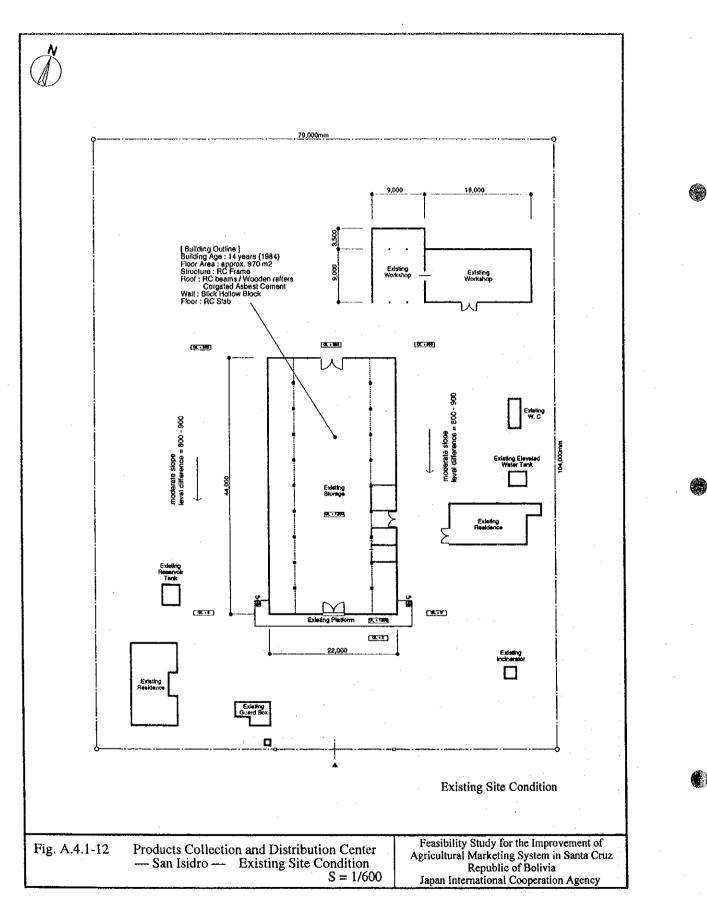
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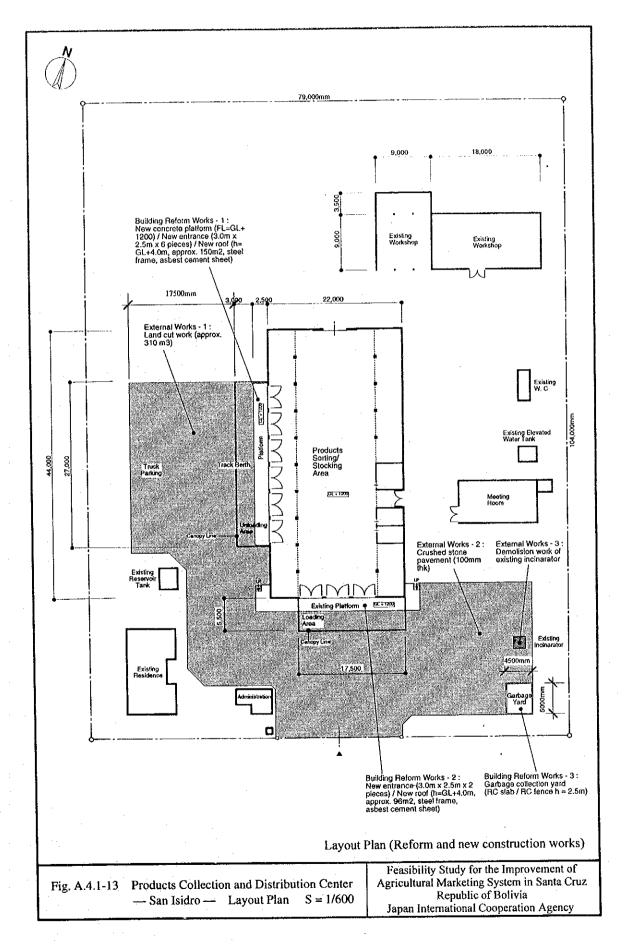


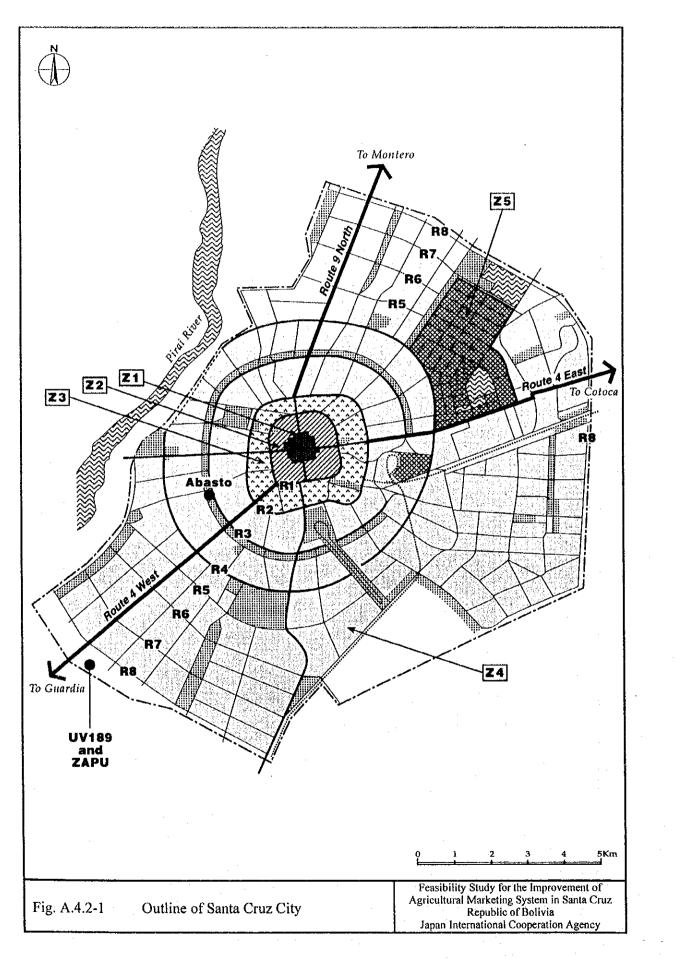
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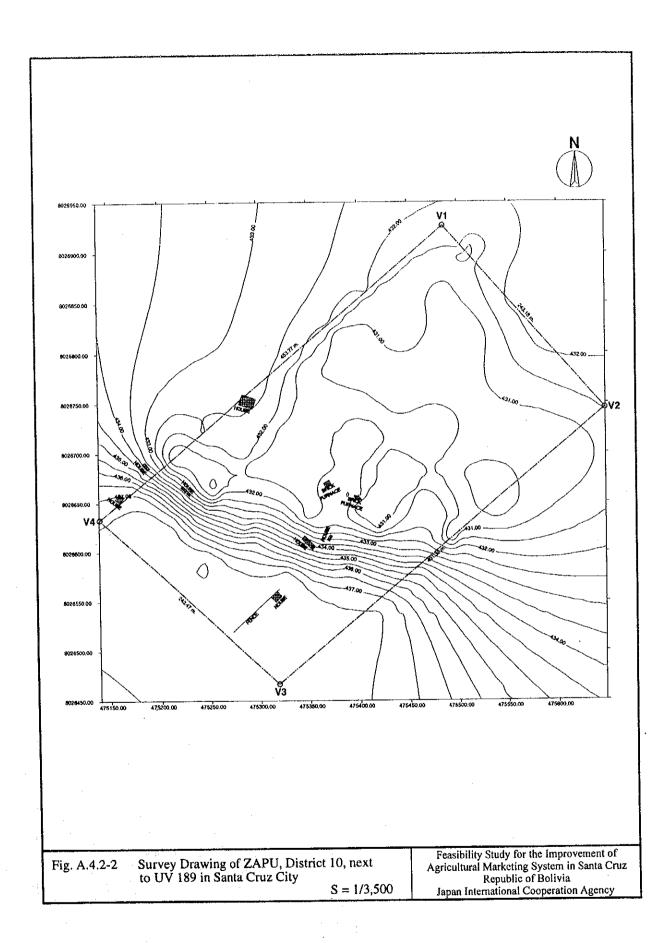




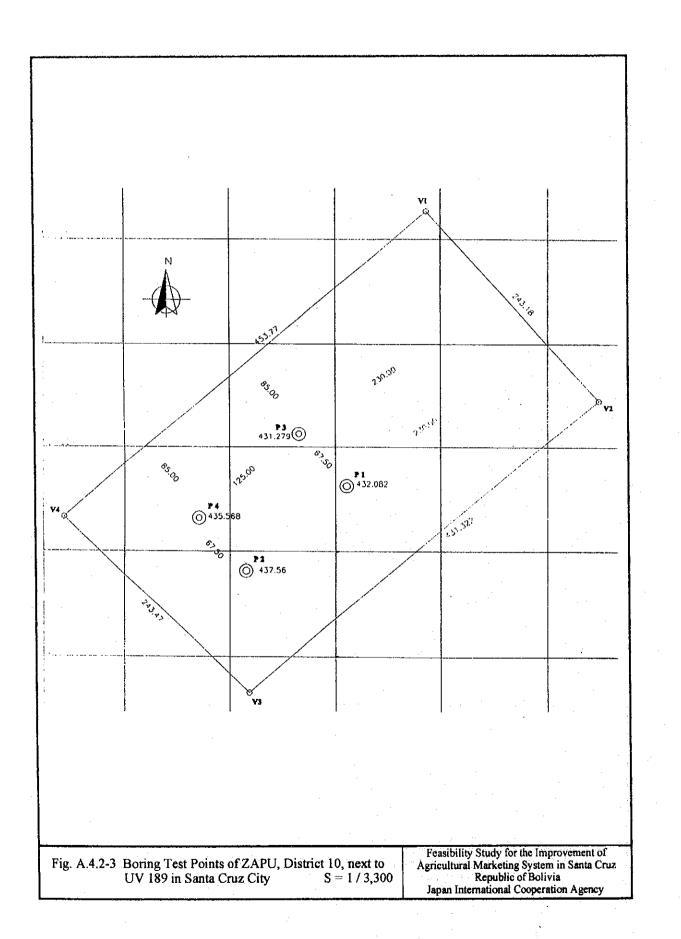


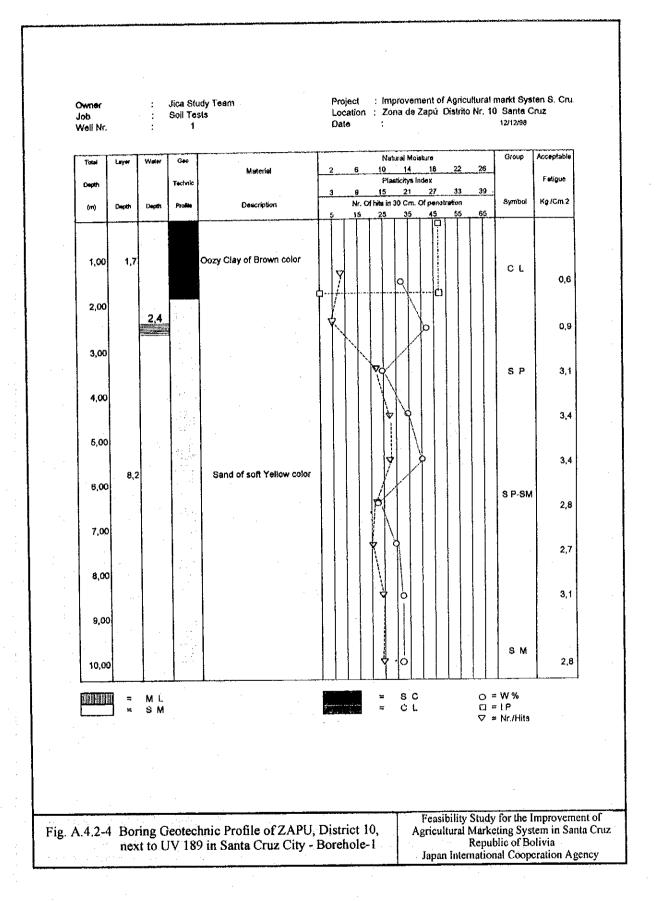


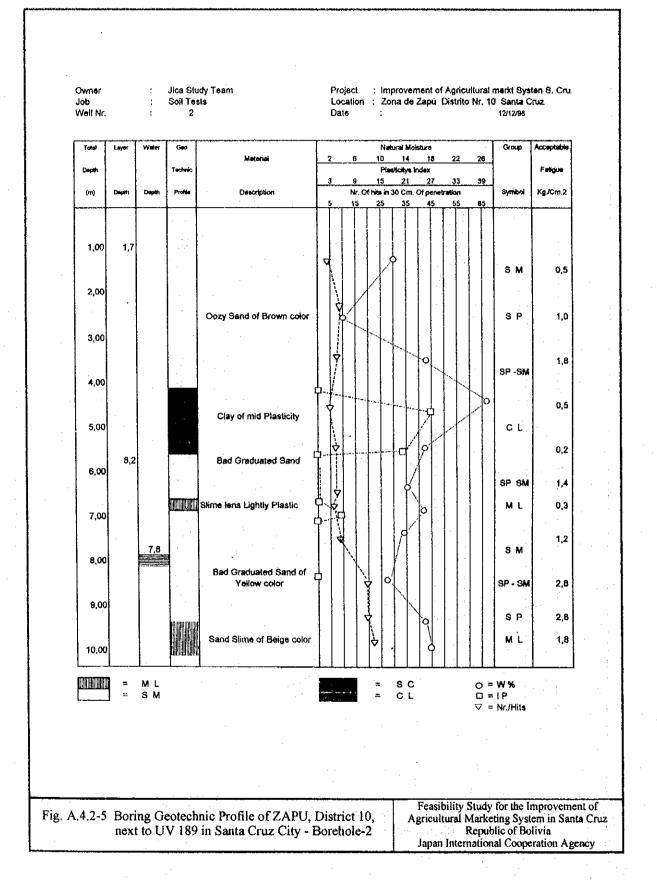


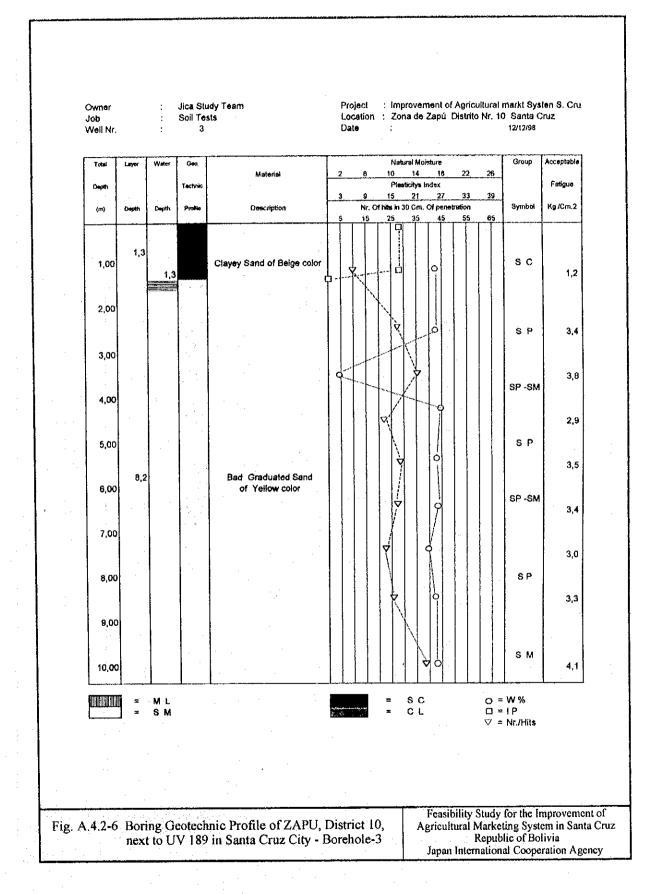


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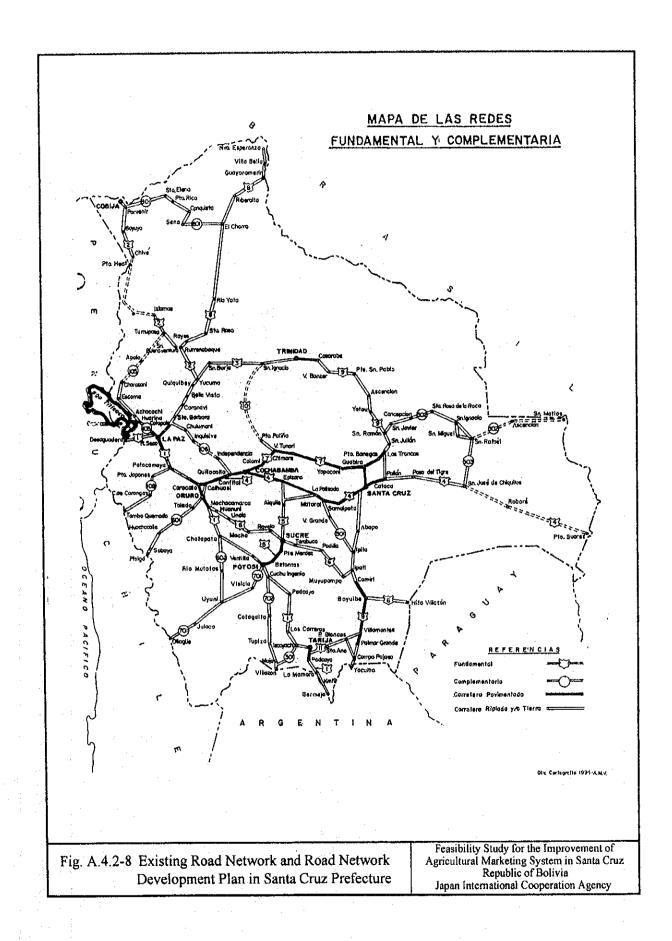


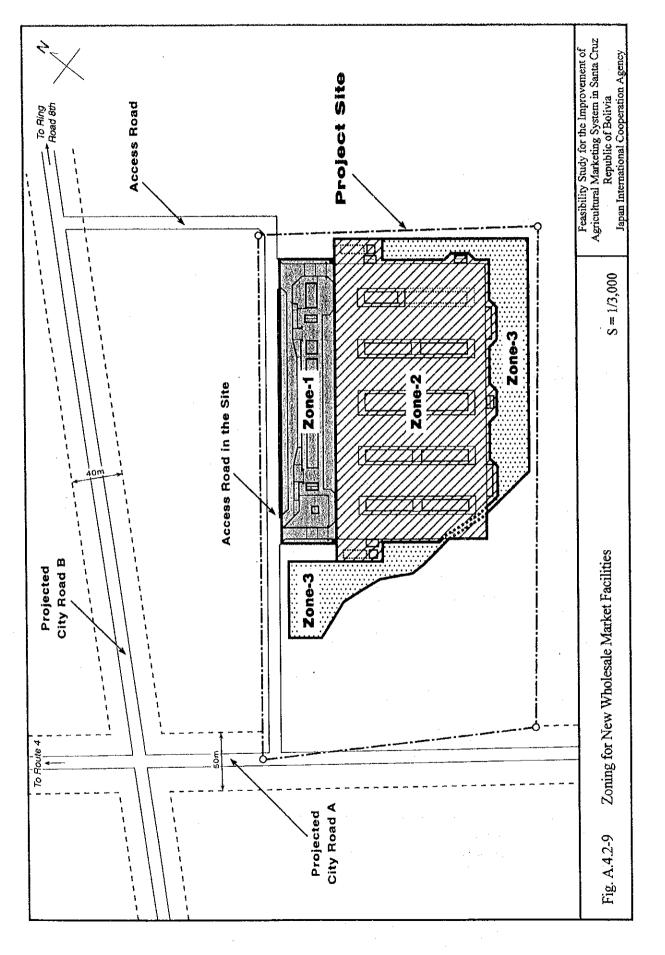




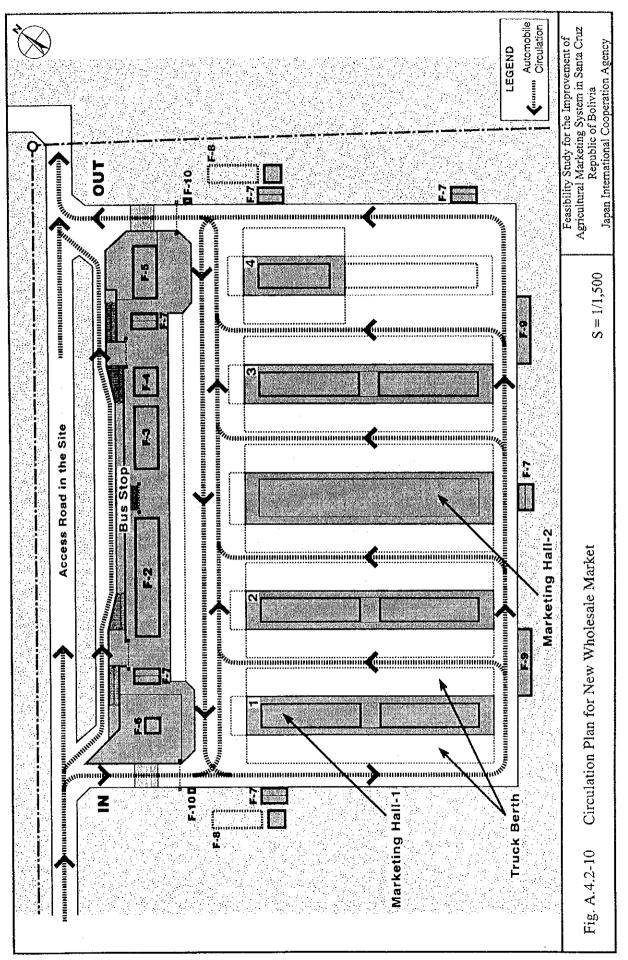


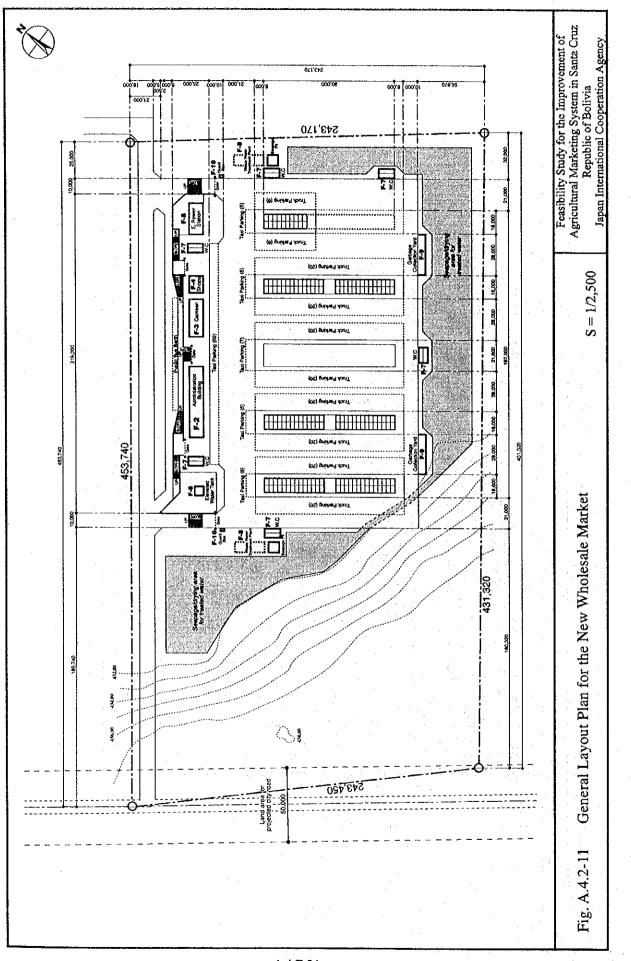
Jica Study Team Project : Improvement of Agricultural markt System S. Cru. Owner : Job Soil Tests Location : Zona de Zapú Distrito Nr. 10 Sente Cruz Well Nr. 4 Date 11/12/98 ; Natural Moisture Group Acceptable Total 640 Laye Wate 14 18 Material 10 26 Plasticitys Index Faligue Technic Depth 15 21 27 33 39 Nr. Of hits in 30 Cm. Of penelsation Symbol Kg/Cm.2 Prolite Description (m) Depti Depth 25 35 55 15 1,00 2,00 Bad Graduated Sand SP-SM 1,2 2,00 Clay of Mid Plasticity сL 1,00 0,6 D Brown color 3,00 1,00 Sandy Slime of Beige color мĹ 0,7 4,00 0,70 CĿ 0,6 **Clay of Mid Plasticity** 5,00 Brown color 0,80 S P - SM 1,3 6,00 1,30 Sandy Slime of Yellow color ΜĹ 1,0 d------7,00 7,6 1,7 8,00 3,30 Bad Graduated Sand of SP - SM Yellow color 2,7 9,00 2,5 10,00 Ξ ML s С 0 = W % = SM CL CI = [P ♥ = Nr./Hits Feasibility Study for the Improvement of Fig. A.4.2-7 Boring Geotechnic Profile of ZAPU, District 10, Agricultural Marketing System in Santa Cruz Republic of Bolivia next to UV 189 in Santa Cruz City - Borehole-4 Japan International Cooperation Agency



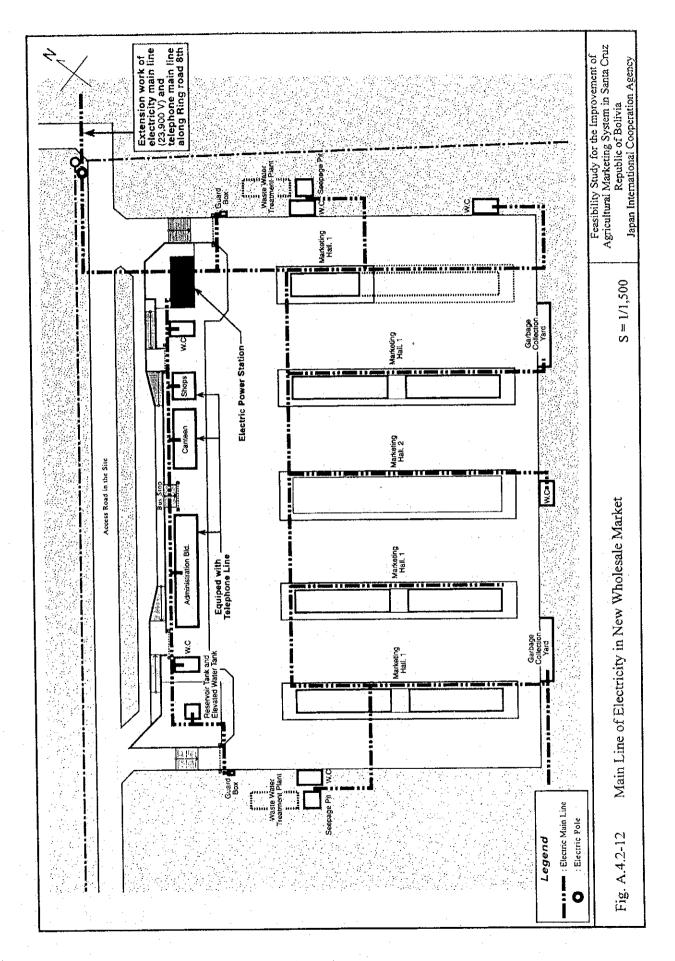


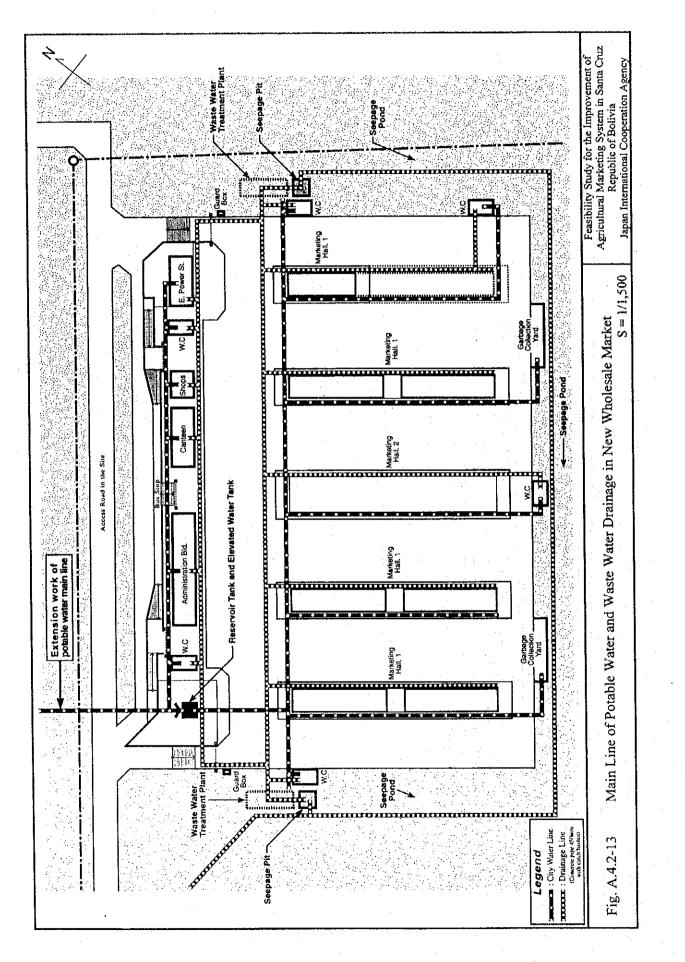
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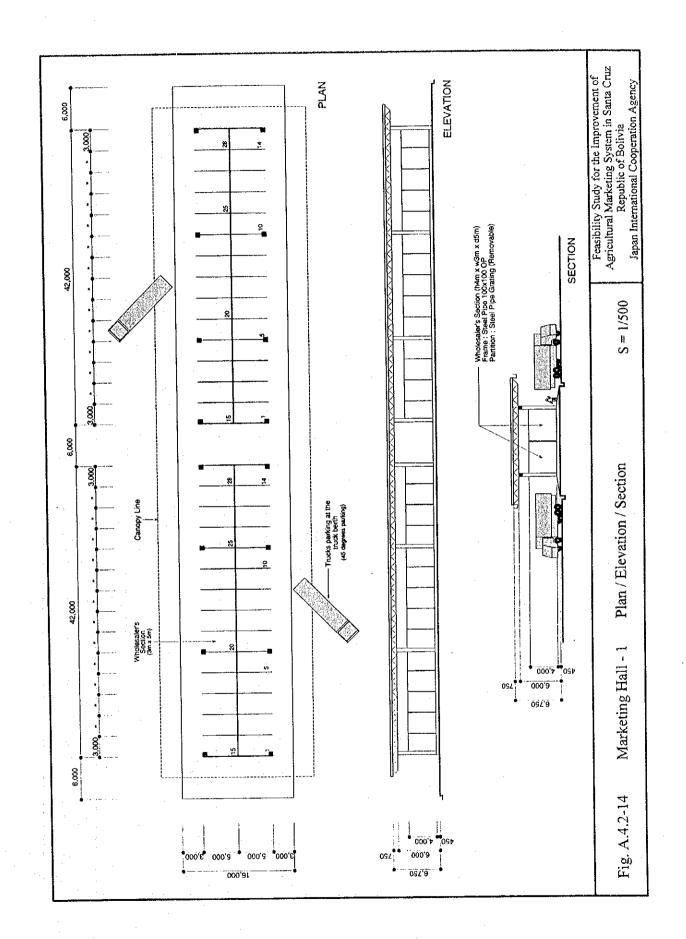




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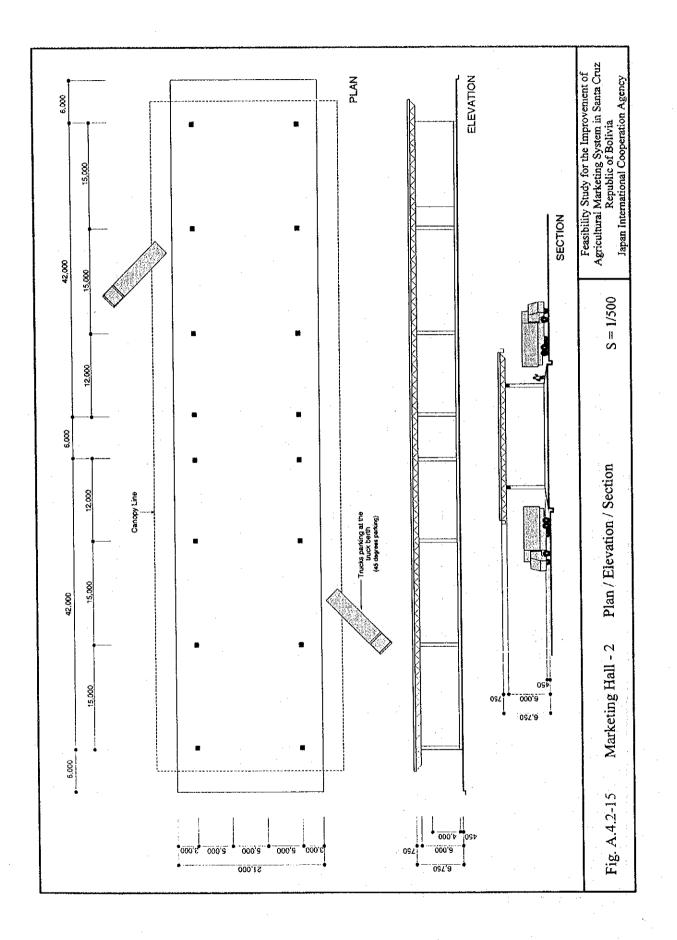


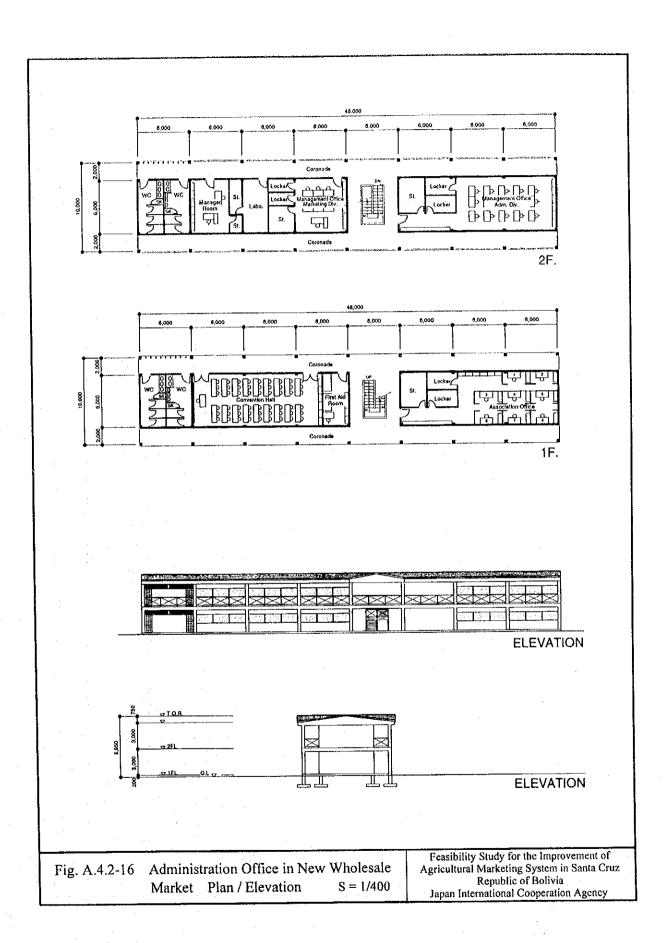


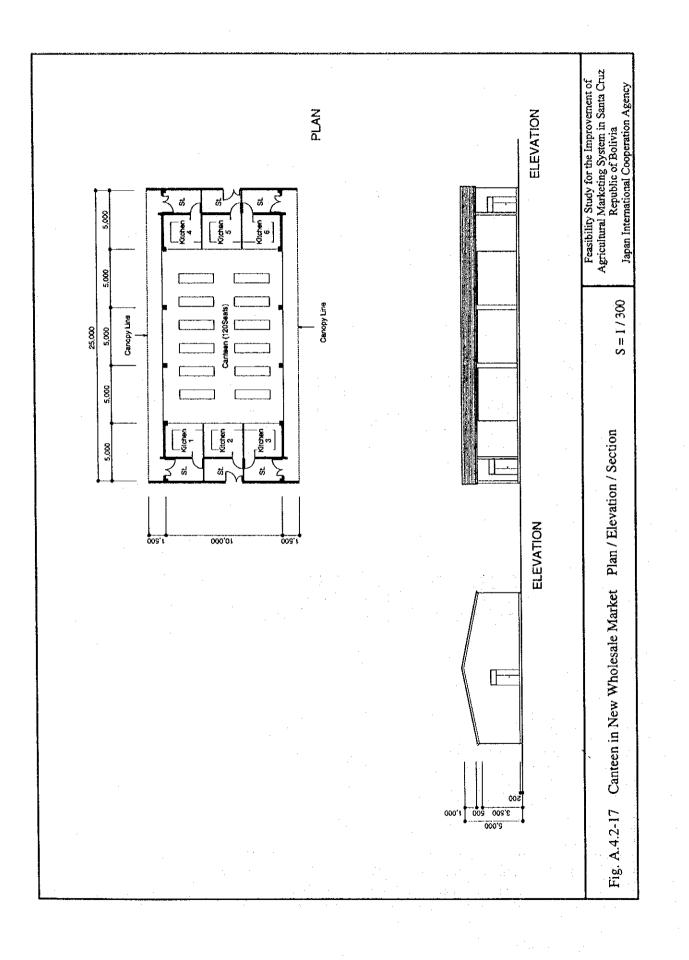


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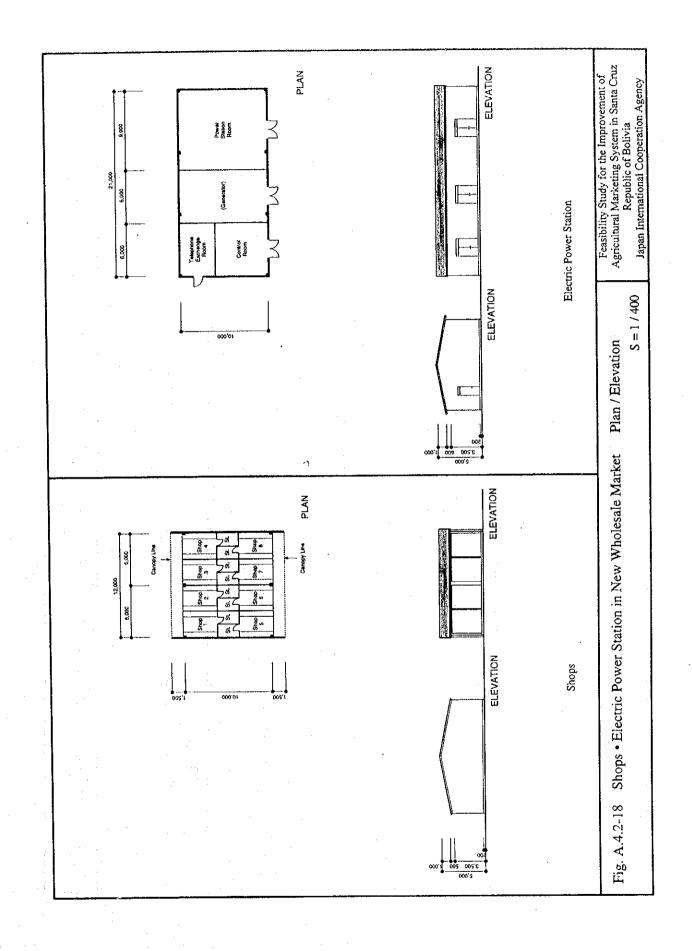
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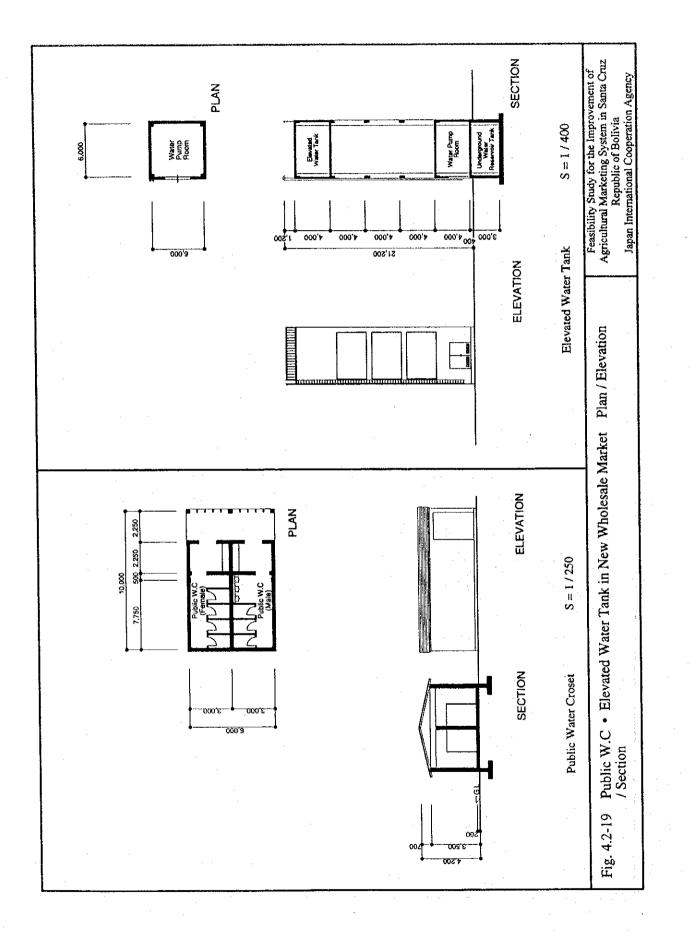


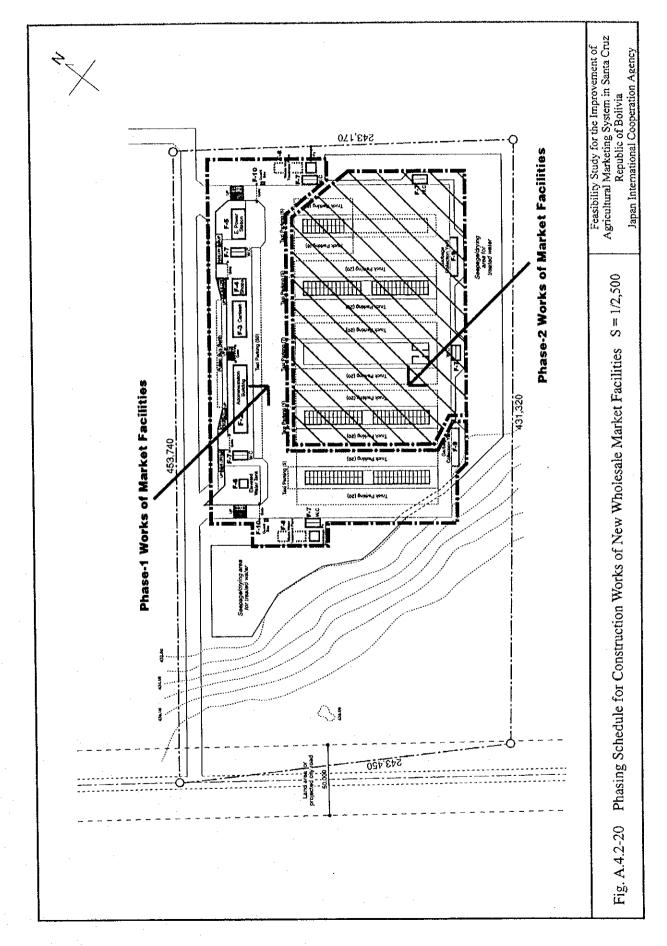


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Locality	No. of Boreholes	Depth	Phreatic Level	Characteristics	Observations
Saipina	1	10.00	Not available	Up to 1.70 m, Sandy Slime. From 1.70 m to 10,00 m, Rock.	Apt to foundations, in any depth
Pampa Grande	1	10.00	Not available	Up to 5.50 m, Sandy Material. From 5.60 m to 10.00 m, Slime, Lighty Plastic.	Apt to foundations, in any depth
				Borehole #1 and #3.	
	`			Up to 1.70 m, Clay. From 1.70 m to 10.00 m, Sand Materials. Phreatic Level, between 1.30 m and 2.40 m.	
				Borehole #2	
Santa Cruz	4	10.00	Available at Different Depth	Up to 4.00 m, Slime Sand with Good Resistance. From 4.00 m to 5.00 m, Medium Plastic Clay with Low Resistance. From 5.00 m to 6.50 m, Lens Shape Clay Layer with Low Resistance. From 6.50 m to 10.00 m, Sand Materials with Good Resistance.	a carefully researth
			· ·	Phreatic Level, at 7.8 m.	
				Borehole #4	
				Up to 2.00 m, Poor Graded Sand From 2.00 m to 5.00 m, Slime Clays and Clayly Slimes. From 5.00 m to 10.00 m, Sandy Materials, Phreatic Level at 7.60 m	- 

## Table A.4.1-1 General Characteristics of Soil Condition (Result of Boring Test)

# Table A.4.1-2 Foundation Recommendation (Result of Boring Test)

3

Locality	Foundation Level	Phreatic Level	Admissible Stress (kg/cm2)	Foundation Type	• Observations
Saipina	-0.6	ч	1.00	Spread	Seismic Zone
Pampa Grande	-0.6	-	1.00	Spread	Seismic Zone
Santa Cruz	To define by project engineer	429.6	Over Sandy Soil, 1.00 kg/cm2. Over Clay, 0.50 kg/cm2	Spread	Non Seismic Zone

	Table A.4	Table A.4.1.3 Required Floor Area for Products Collection and Distribution Center Planaed handling volume	ed Floor A	rea for Products Colli- Planed handling volume	ducts Colle fling volume	etion and	Distribution No. of unlow	tion Center unloading trucks		Sorting			Productd stocking	tocking	Loading		Box/baske	Box/basket stocking area		Total platform atta	form area
Description         Feat         Feat	Production	Products licem	peak senso collection volunic (ton/month A	n planed operation days per month B	planned overage hondling volume (ton/day) C=A/B	peak handling volume (ton/day) D=C*1.5	unloading tonnage of dominant trucks (ton)		sorter's working capacity (ton/day/man)	required <sup>re</sup> sorters F=D/E	aquired floor area for sorter (m2/person) G	oquired sorting rea (m2) H=F*G	tonnage aockable ste in 1 m.2 ste (ton/m.2) j	required scking area (m2) I=D/I=1.5	required unicading / loading area (approx, m2) K=)*0,27	roquired ton stocking stocking M=D/1.34	required intuce-basket p stocking area (m2) N=D/0.45	required piment-basket stocking area (m2) C=D/0.36	total box/basket stocing area (m2) P=(M+N+O)*1.5	total floor area of placform and box/barket stocking area Q=H+J+K+P	Required no. of platform unit R=Q/12,5m2
	Samaipata	Potato Tomato Other Fruits Tettal	Feb.	-	17.67 4.00 8.67		3.00 3.00 3.00	58.8 00.2 50.4	21 21 21	21.20 4.80 10.40 36,40	2.00 2.00 2.00	42,40 9,60 20,80 72,80	0.5 0.6 0.6	79.50 15,00 32.50 127.00	34.29	4,48 9.70 14.18			21.27	255.36	'
	Mairana	o c Voge Fruits	Nov		5.4 5.3 9.04 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2		3.00 3.00 3.00 3.00	2.17 1.67 1.67 1.00 1.00 7.17 20.00	125 123 123 124	5.20 4.00 0.00 17.20 2.80	5 8 8 8 5 8 8 8 5 8 8 8	10,40 8,00 0,00 4,80 34,40 57,60	0.5 0.09 0.6 0.6	19,50 12,50 100,00 7,50 53,75 133,25	32.18	3.73 16.04 19.78	ee.et		49.66	332.69	3.14
part         Prane         Nov.         Stell         10         17.3         27.00         3.07         1.25         2.2.0         4.4.0         0.5         87.06           Tonation         190         10         10         10         10         10         5.3         9.50         3.07         11.25         7.60         2.00         4.4.0         0.5         8.7.7           Pinate         3.0         100         3.06         4.17         -         -         0.00         0.00         0.06         7.57           Plant         3.0         1.01         3.00         0.00         1.25         2.7.20         2.00         4.6.0         0.5         7.57           Total         3.00         11.33         1.25         7.60         2.00         3.7.7         4.5.3           Total         3.01         10.0         3.00         11.33         1.25         7.60         2.00         3.7.7         4.5.39           Total         3.01         3.00         11.33         1.25         2.7.20         2.00         3.7.6         0.00         0.6         2.7.3         4.5.39           Total         19         3.01         1.25         1.25	P. Grande	Potato Tomato Lettuce Other Vese Citrus Total			28.33 6.67 8.33 4.67 0.00		3.00 3.00 0.75 3.00 3.00	14,17 3.33 16,67 2.33 0,00 36,50	81 81 81 81 81 81 81 81 81 81 81 81 81 8	34,00 8,00 5,60 47,60	2.00 1.00 2.00 2.00	68,000 16,00 0,00 0,00 0,00 9,5,20	0.6 0.09 0.00 0.0	127,50 25,00 17,50 17,50 378,33	102.15	7.46 0.00 7.46	27.78 27.78		52.86	628.54	5,59
Pretrie         Nov.         640         310         310         1133         1235         27.26         200         34.40         0.5         102.00           Tomatio         100         310         317         1235         7.60         200         15.20         6.5         12.36           Com         410         30         13.67         3.00         3.07         3.17         1.25         16.40         2.00         15.20         6.5         6.139           ObserVege         2.60         3.0         0.00         0.00         3.00         3.00         1.25         16.40         2.00         3.236         6.5         5.136           ObserVege         2.60         3.00         0.00         1.25         3.00         1.25         1.250         0.6         2.03         3.0376         0.6         2.0376         0.6         2.037         1.206         3.036         1.2         1.25         1.22.00         2.00         2.136         0.6         2.136         0.6         2.136         0.6         2.136         2.03         2.03         0.6         2.136         2.136         2.136         2.136         2.136         2.136         2.136         2.136         2.136<	Comarspa	Potatio Tomato Piment Other Vege Other Fruits	V, - X		19.33 6.3 1.67 2.00 2.00		3.00 3.06 3.06 3.00 3.00	9.67 3.17 4.17 1.00 0.00 18.00	1.25 1.25 1.25 1.25	23.20 7.60 0.00 2.40 33.20	2.00 2.00 2.90 2.90	46,40 15,20 0,00 4,80 66,40	0.5 0.07 0.6 0.6	87.00 23.75 53.57 7.50 0.00 171.82	6F 99	7,09		6.9 6.9	21.05	305,66	<u>и</u> г
Pease         Sept.         20         74.30         3.00         14.33         1.25         35.60         2.00         71.20         0.5         133.90           Terration         4.70         34         1.567         23.90         3.00         1.433         1.25         1.480         2.00         37.60         0.6         34.75           Terration         4.70         34         1.567         2.340         3.00         7.83         1.25         1.880         2.00         37.60         0.6         34.75           Transio         1.20         34         1.25         1.25         1.880         2.00         3.760         0.6         34.75           Transio         1.40         6.00         3.00         2.467         2.40         3.00         2.00         3.760         0.6         34.75           Terration         1.40         6.00         3.00         2.40         2.0	San Isidro	20, 52	-		22.67 6.33 13.67 8.67 8.67		3.00 3.00 3.00 3.00	11.33 3.17 6.83 4.33 0.00 25.67	នានវាត្តា	27,26 7,60 16,40 10,40 61,60 61,60	2.00 2.00 2.00 2.00	34,40 15,20 32,80 0,00 123,20	0.5 0.6 0.6 0.6	102.00 23.75 61.50 32.55 0.00 219.75	6 5	7.09			10.63	412.92	
Polatio         Mar.         Strit         31         1,25         20,00         2,00         0,5         75,00           Temato         377         31         1,25         1,25         1,450         2,00         0,5         75,00           Temato         377         31         1,25         1,450         2,00         2,60         0,6         46,25           Other Vega         80         3,00         1,33         1,25         1,450         2,00         2,60         0,6         46,25           Other Vega         80         3,00         1,33         1,25         1,25         3,20         2,00         0,6         46,25           Other Fruits         3,30         1,23         1,25         3,20         2,00         0,6         46,25           Other Fruits         3,30         3,10         1,33         1,25         2,00         0,6         44,25           Other Fruits         3,30         3,10         1,23         1,22         2,00         0,6         44,25           Other Fruits         3,30         1,23         1,23         1,22         2,00         0,6         41,20           Totalis         1,00         1,03         1	Saipina	o Veyc	-		29,67 15,67 4,00		00.E 00.E	14.83 7.83 2.00 24.67	12 123 123	35.60 18.80 4.80 59.20	2.00 2.00 2.00	71.20 37,60 9,60 118,40	0.5 0.6 0.6	53,50 57,55 15,00 15,02	55.96	17.54 17.54			26.31	407.91	3.63
	V, Grande	Potate Tomate Other Vege Other Fruits Total	-		16.67 12.33 2.67 11.00	· ·	3.00 3.00 3.00 3.00	8.33 6.17 1.3 1.33 5.50 15.83	<u> </u>	20.00 14.80 3.20 38.00	2.00	40.00 29.60 6.40 76.00	0.6 0.6 0.6	75.00 46.25 10.00 41.25 172.50	46.58	13.81 12.81 26.12			39.18	Σ, Ř	2.97

T-No A 41-4 Building Onfline of Products Collection and Distrib	istribution Center	Center						
				1	1144	Main Structure	ore	1
	No. of Facilities	No. of Story	Total floor area (m2)	Type of Fundation	Floor	Framing	Roof	guntantri loon
Samaipata E 1 Druduets Collection / Distribution Center Bldg.		-	approx. 330	(Spread)	(RC slab)	(RC slab) (RC column / beam) (Steel beam / rafter)		(Corrugated asbestos cement sheets)
(Reform of existing facilities)								
F-2 Garbage Collection Yard	-	-	25	.!.	RCslab	RC feace h=2.5m		
Mairana				- - -				Contraction of an and an and a series of a
F-1 Products Collection / Distribution Center Bldg.		-	608	Spread	RCslab	RC column / RC	Steel beam/rafter / KU	Steel beam raties / KU / Corrugated galvanized acet succes / Aspuari water provi
	<b>1</b>	-	33	Spread	*****	RC column / beam	Steel beamvranter / KU	Steel beam raiter / KC : Corregated assession centent succes
F.3 Garbage Collection Yard		-	22	<b>1</b>	RC slab	RC fence h=2.5m		
Pampa Grande								Contemptation ( Acredit Press, Sector Contemptation )
F-1 Products Collection / Distribution Center Bldg.	~	-	803	Spread	:	RC column / RC	Steel beam/ratter / KU	Steel beam/raiter / KU - Corregated gaivanized steel succes / Appual water provi
F-2 Public W.C. (incl. seepage pit)	-	-	33	Spread		RC column / beam	Steel beam/rafter / KU	Steel bean/raiter / KU: Corrugated asbestos cament succes
F-3 Garbage Collection Yard			25		RCslab	RC lence h=2.5m		
San Isidro		:		• .		1		Anterna and and an and a second s
F-1 Products Collection / Distribution Center Bldg.		-	approx. 970	(Spread)	(RC stab)	(RC column / beam) (Steel beam / ratter)		(Cottagaine asicestos tement succes)
(Reform of existing facilities)								
F-2 Garbage Collection Yard	P=1	-	25	•.	RCslab	RC tence h=2.5m	<u>.</u>	4
Comarapa			1	• (			Starl Land, mear / DC	Such transfer to Dr. Communited anived steel sheets ( A subalt water)000
F-1 Products Collection / Distribution Center Bldg.		-	-074 	Spread				
F-2 Public W.C. (incl. seepage pit)	-		193	Spread		RC column / beam	Sleel Deam/Taller / KU	Sidel Deam Taitel / KU: Corregated Astesuos Centent surves
F-3 Garbage Collection Yard			25		RC slab	KC lence b=2.5m		
Saipina							~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	2
F-1 Products Collection / Distribution Center Bldg.	-	-	809	Spread		KC column / KC	Steel beam/ratter / KC	Collegator galvanizou stori succes / hepitate march out
F-2 Public W.C. (incl. seepage pit)		-	33	Spread		RC column / beam	Steel beam/ratter / KU	Slee  beanvratter / AC ; Corregated asocstos cement succes
F-3 Garbage Collection Yard		-	2	•	RC slab	RC feace he2.5m		
Valle Grande							Charl heam(milter / DC	Start harminefter / DO Commented enlyanized steel sheets / Ashhalt WaterDroof
	·····		C64	Spread		PC column / hear	Steel heam/rafter / RC	Such team (mitter / RC <sup>-</sup> Cornested asbestos cement sheets
F-2 Public W.C. (incl. seepage pit)	-	-		opresu	2001-1-1			
F-3 Garbage Collection Yard	1	-	1	•	INC STAR			

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Table A.4.2-1	REQUIRED FLU	REQUIRED FLOOR AREA FOR MARKETING	ARKETING HALL - 1									method etc	Productd stocking area	Units
				Planne	Planned handling Volume				Planad d				•	
T <b>arge</b> t year	Estimated consumption volume in Santa Cruz City (ton/year)	Plarmed handling volume not through Abasto Market and New Wholesale Market (ton/year)	Planned handling Market and New (ton	Planned handling volume in Abasto Market and New Wholesale Market (tonlycar)		Products items and their planned handling volume in New Wholesate Market A	ir planned / Wholesale	planed operation h days per year B		peak bandling volume (ton/day) D=C*1.5	S E S S	tonnage stockable in 1 m2 si (ton/m2) (( I	required stocking area (m2) ]=D/i	required no. of wholesalers section K=J/11.25m2
		•	Abasto Market	New W. Market		ltem	volume (ton/year)							
2005	000 000	UUU BE	000 501		239.000 Potato / Onion	UO.	116,000	365	317.81	476.71 D	D=C*1.5	0.5	953.42	
CUU2	יחחחיחפר				Banana	_	29,000		79.45	119.18 D	D-C*1.5	<b>0.4</b>	297.95	
					Fruits (Citrus)	(র	38,000		104.11	156.16 D	D=C*1.5	0.6	260.27	
													86.76	– Fnuit Box
					Tomato	•	56,000	365	153.42	230.14 D=C*1.5	C*1.5	0.6	383.56	1
										01 00			7 100 87	– Fruit Box 187 54
		-			Total		239,000			61.204			-0.001.4	
0100		45 000	122 000		284,000 Potato / Onion	-	136,000	365	372.60	558.90 D	D=C*1.5	0.5	1,117.81	
				÷	Banana		35,000	365	95.89	143.84 D	D-C+1.5	<b>9</b> .0	359.59	
					Fruits (Citrus)	(sr	48,000	365	131.51	197.26 D	Dectis	0.6	328.77	
					-		•.	•					109.59	Fruit Box
					Tomato		65,000	365	178.08	267.12 D=C*1.5	=C*1.5	9.0	445.21	
													148.40	Fruit Box
				-	Total		284,000	·		1,167.12			2,509.36	223.05
Remark	<ol> <li>Wholesalers unit 3 m x 5 m</li> <li>1 cluster of wholesalers unit</li> </ol>	<ol> <li>Wholesalers unit 3 m x 5 m</li> <li>1 clueter of wholesalers unit : 56 units / 2005</li> </ol>		56 unite/cluster x 3 cluster + 20 units = 188 units, 2010 : 56 units/cluster x 4 cluster = 224 units	r + 20 units =	= 188 umits, ;	2010: 56 ur	uits/cluster x 4 c	luster = 224		-			
2 2 1 1		almala la				•			•					-
Table A.4.2-2	Building Cuthin	Table A.4.2-2 Building Outline of New Wildlesser Marter				-		Main Structure	ucoure					
			No. of Facilitie	No. of Story	Total floor area (m2) F	Type of Fundation	Floor	Framing		Roof		Roof Finishing	shing	
<ul> <li>F-1 Marketing H Marketing H Marketing H Marketing H</li> <li>F-2 Administrati</li> <li>F-3 Canteen</li> <li>F-4 Shops</li> <li>F-5 Shops</li> <li>F-5 Shops</li> <li>F-5 Shops</li> <li>F-6 City Water</li> <li>F-7 Public W.C.</li> <li>F-8 Wasted Water</li> <li>F-10 Guard Box</li> </ul>	Marketing Half Marketing Hall - 1 Marketing Hall - 2 Administration Office Canteen Shops Electric Power Station City Water Reservoir / El Public W.C. Wasted Water Treatment Garbage Collection Yard Guard Box	Marketing Half Marketing Half - 1 Marketing Hall - 2 Administration Office Canteen Shops Shops Electric Power Station City Water Reservoir / Elevated Water Tank Public W.C. Wasted Water Treatment / Seepage Pit Garbage Collection Yard Gurard Box				L)	22222222222222222222222222222222222222	RC column / Entel RC column / Entel RC column / beam RC column / beam		ce truss ce truss m / rafter m / rafter m / rafter n / rafter	Corrugated aluminum sheets Corrugated aluminum sheets Roof tile Roof tile Corrugated asbestos cement sheets Asphalt waterproof finish Asphalt waterproof finish Corrugated asbestos cement sheets Corrugated asbestos cement sheets	aluminum a aluminum a asbestos ce erproof fin asbestos ce asbestos ce	theets theets ment sheets ish ment sheets ment sheets ment sheets	

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Project tiems	MONTES MONTES 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 39 34 35 36 37 38 37 38
1 Land Acquisition	
1 Land Acquisition for Projected City Road to Ring 8th	
2 Land Acquisition for Access Hoad to Stle	
3 Land Acquistion for the New Witnessale Manuel	
2 Land Cut-of	
3 Fliting	
3 Intrastructure Extension outside the Site	
1 Electric Main Line	
2 Telephone Meth Line	
3 PORADIe Water Main Line A Access made (reclarad etty read)	
5 Access road to Ste	
6 Rein dreinege ditch	
	Phase 1 Work
1 Bunding works	
E.6 Electric Power Station	
F.7 Public W.C.	
F-8 Wasted Water Treatment / Seepage Pt	
F-9 Garbage Collection Yard	
F-10 Guard Box	
<b>Z</b> 1	
1	
1 Street lights	
3 Main Line of Infrastructure in the Site	
A Electricity Main Line	
B City Water Main Line	
C Wasted Water Main Line (Incl. seepage pipe)	
4 Special Equipment Supply	
E-1 Handling Tool	
E-2 Telephone/Fax	
E-3 Computer	
<u>د</u>	
Truck Scale	
Balkhice	

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

# ANNEX 5

# PROJECT COST ESTIMATION AND EVALUATIONS

# ANNEX 5 PROJECT COST ESTIMATION AND EVALUATIONS

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### 1 COST ESTIMATION

## 1.1 Condition for cost estimation

Project cost estimation was carried out under the following conditions:

- 1) Project costs were calculated as of November, 1998.
- 2) Unit prices are constant prices as of November, 1998.
- 3) Cost was estimated in US Dollars. Exchange rate of Bs.5.62 to 1US\$ was used to convert to local currency.
- 4) Tax exemption is applied to all imported material and equipment.
- 5) Project cost was calculated based on the current local unit cost in Bolivia except the construction cost of the NWM facilities.
- 6) The construction cost of NWM facilities was calculated based on the unit cost of overseas development assistance project that supplies high grade facilities
- 7) Construction period for each phase of construction was assumed to be one year from the time of contract signing.

# 2 BENEFIT CALCULATION

# 2.1 Gross benefit and benefit by target group

Items of gross benefit, system of basic unit setup for scale/ price/ cost have been identified. Also, benefit distribution system by target group has been examined. Difference in benefit by changes in activities and target group is described below.

## Consumption Area

Item /	Without 1	Project	With NWM Project
Target Group	Retail Function	Wholesale Function	
Congestion or	utside Abasto Market due to i	increase in truck traffic/ n	narket handling volume
Producers / Intermediaries     · Transporter	<ul> <li>longer loading &amp; unloa congestion</li> <li>increase use of porter to increasingly parked outs</li> <li>The truck traffic will increase market volume handled by t affecting:         <ul> <li>loss of time due to sell</li> <li>loss of time due to con</li> <li>increase use of parking</li> <li>increase congestion and</li> </ul> </li> </ul>	o unload as trucks are side se with the increase in he Abasto Market ing from truck gestion and traffic jam space outside market	<ul> <li>With the removal of the wholesale function from Abasto Market, traffic load and congestion will decrease.</li> <li>The NWM will have enough space and car park to accommodate the wholesale traffic for efficient unloading &amp; loading and movement of products.</li> <li>Benefit of space availability at any time for transporter</li> <li>Benefit of immediate unloading for transporter / Producers / Intermediaries</li> <li>Benefit of time saving from lack of traffic jam</li> </ul>
Space congest	ion inside Abasto Market		
Producers / Intermediaries	of space inside Abasto	transport products into uck packed outside	<ul> <li>Benefit of space inside market for unloading</li> <li>Benefit of cheaper porter cost</li> <li>Benefit of immediate unloading / sales</li> </ul>
Transporter	<ul> <li>long waiting time for tr Market</li> <li>loss of time selling pro Abasto Market</li> </ul>	ucks to enter Abasto	
Wholesalers	Abasto Market cannot accommodate any increase in number of retailers	Abasto Market cannot accommodate any increase in number of wholesalers. Inefficient and time consuming wholesale activities will get worse.	<ul> <li>The NWM will be able to accommodate increasing number of wholesalers interested to participate leading to increase wholesale volume and activities.</li> <li>Efficient wholesaling function will be possible with the project.</li> <li>At Abasto Market, number of retailers may increase as wholesaler function is resulting in more space for retail activities there.</li> <li>Additional cost for retailers to go to NWM to buy products for sale at</li> </ul>

Porter	<ul> <li>Congestion in market creates bad working condition and restricts product movement.</li> <li>number of porter in the market unlikely to increase due to congestion.</li> </ul>	<ul> <li>loss of jobs in Abasto with wholesale function relocation to new market</li> <li>improvement in work condition with less congestion</li> <li>possibility of increase in number of porters in both NWM and Abasto.</li> </ul>
Consumers	Consumers will find it increasingly difficult to access Abasto Market due to the congestion and traffic jam.	- Traffic and congestion will be reduced with the removal of wholesale function from Abasto Market.

## Production Area

Production F					
Item /	Without Pro	With Collection / Distribution Centers Project			
Target Group	Retail Function	Wholesale Function			
Production	Production volume will remain	With technical assistance and guidance, production volume will increase.			
Commerciali zation	Commercialization rate will re	With the operation of C/D centers enabling better marketing opportunities and timing, commercialization rate will increase.			
Information system	Information system does not e	The project will introduce an information system to inform the farmers on the market prices of produce.			
Marketing system	Marketing system will remain small trucks with inefficient tr	With the collection centers, a more efficient transport system will be introduced with subsequent time and cost savings.			
Producer / Intermediary	<ul> <li>Income will remain stable as production and commercialization increase potential not realized</li> <li>Time lost following products to consumption area to sell products</li> <li>lack of price information to decide market destination and timing to sell product</li> </ul>		<ul> <li>increase in income due to increase in production and commercialization volume through training / technical assistance.</li> <li>alternative use of free time</li> <li>better business decision on when and where to sell product</li> <li>additional time and cost incurred to use collection center</li> </ul>		
Transporter	- transport using small trucks for sale at consumption area unchanged due to stable prod	will remain largely	- more efficient transport with use of center		

Especially for small-scale producers in the Valley areas, establishment of the organized collection/ distribution system plays a key role in the extent of benefit they may gain in use of the new wholesale market.

1)

Without organized collection/ distribution: Accessibility to price information from the new wholesale market and alleviation of congestion within the market

will reduce market loss (degradation of commodity value and time loss). The actual income is expected to increase.

2) With organized collection/ distribution: In addition to the above 1), benefit from direct sales by gaining wholesaler's qualification is expected. In consequence, for producers in the Valley areas, the effect of comprehensive marketing improvement including the production area and consumption area is maximized with organized collection/ distribution.

Users of the new wholesale market apart from producers of the Valley areas will benefit from effects described in 1). It is also applied to the retailers and intermediaries of Abasto Market.

Analysis of the positive and negative impacts of the project on each of the target groups together with development policies to achieve the desired impacts are shown in Table A.5.2-1.

## 2.2 Benefit Items

With the implementation of the project, it is envisaged that there will be time / cost saving benefits in the following items (see Table A.5.2-2).

#### (1) City Entry Time Restriction

Trucks over 10t will be able to enter the NWM at any time without having to wait for nightime to enter the city limit to get to Abasto Market due to traffic restriction. The time restriction to enter means that trucks have to wait and / or time their departure to arrive at Abasto Market at night. Based on traffic survey data at Abasto Market, the annual benefit of entry at anytime to NWM will be US\$91,772 in 2002 and US\$121,140 in 2010.

#### (2) Space Restriction Inside Abasto Market

There are times when parking space inside Abasto Market is not available to trucks arriving at the market. As such, these trucks are forced to wait outside the market with their products until parking space is available inside Abasto Market. Based on survey data, 36 trucks per day wait an average of 9 hrs outside before finding space inside Abasto Market. 35% of these trucks parked outside will also engage in selling produce from the truck.

The present marketing system at Abasto Market allows some selling of products directly from the trucks. This type of selling method means that the trucks and the producers/ intermediaries are obliged to stay at market for the period of time it takes to sell all the products, generally not more than 3 days. The average time taken to sell produce from the truck is 19 hours.

The NWM will do away with this selling method resulting in benefits from time saving for transporters, reduce porters handling cost to bring produce into market from truck, and time saving for producers/ intermediaries. The annual benefit of immediate entry into the NWM to unload will be US\$858,990 in 2002 and US\$1,133,866 in 2010.

#### (3) Selling from truck outside Abasto Market

Some trucks that cannot get into Abasto Market are compelled to sell their produce from the truck while parked outside the market. Survey data shows 14 trucks per day are selling from trucks and they take an average of 12 hours to finish selling. The NWM will do away with this selling method resulting in benefits from time saving for transporters, reduce handling cost of porters to bring produce into market from truck, and time saving for producers/ intermediaries. The annual benefit from this item will be US\$628,570 in 2002 and US\$829,713 in 2010.

#### (4) Reduction of Quality Loss (Value Loss) for Tomato

It is envisaged that with the Project's information network, over-supply conditions for tomatoes will be lessen. At present, over-supply condition leads to excess / unsold tomotoes being thrown away in the trash or experiencing a sharp price reduction. With better information on prices and supply condition with the Project implementation, it is assumed that the producers will be able to somewhat control / adjust the shipping of the tomatoes to the market until such time as the over-supply condition reduces and prices improves. Currently over-supply condition leading to products being thrown away is observed 2 times in a month. It is assumed that adjusted harvesting based upon marketing information will at least ensure the sale of tomato at Bs.1 / kg. This will result in benefits of US\$19,790 in 2002 and US\$25,745 in 2010.

#### (5) Consumer Time Saving

Due to the congestion at Abasto Market, consumers lose time when visiting the market to buy their daily necessities. From the household survey of the Master plan, 25% of households in Santa Cruz city go 1 to 3 times per week to Abasto Market. With the relief of congestion by transferring the wholesale function to the NWM, it is estimated that consumers will save 10 minutes each per visit resulting in benefits of US\$145,144 in 2002 and US\$240,383 in 2010.

#### (6) Production Increase

With the implementation of the technical and institutional guidance on cooperative marketing system, improvement in the production technology and crop production planning, the production volume is estimated to increase by about 10% per year in the project area after a time lag for the benefit to accrue. It is estimated that with operation of the Collection and Distribution centers at San Isidro in 2001, Samaipata, Vallegrande and Saipina in 2003, Mairana, Pampa Grande, and Comarapa in 2004, total benefits from the all centers' production increase will be US\$1,623,559 in 2010 based on the assumption that the increase in production volume is multiplied by 70% of net producers' price. 30% of the net producers' price will be additional cost of increase production.

#### (7) Commercialization Rate Increase

Increase in commercialization rate is expected from better handling, packing, reduce losses, opportunity and the right time to market the products with the operation of the Collection and Distribution centers. Benefits from commercialization rate increase of all 7 Collection and Distribution centers will be US\$469,290 in 2010 based on the assumption that the increase in commercialization volume is multiplied by 50% of net producers' price. The remaining 50% of the net producers' price will be additional cost associated with increased commercialization.

#### (8) Cost of Transport

With the Collection & Distribution Center, more efficient marketing and transport system

to bring products to the consumption area will be introduced to reduce the number of truck trips, empty ratio of trucks and the need for producers to follow the products to market. The benefits of this will be offset by additional cost of transport associated with bringing the products to the Collection and Distribution centers from the farms. It is assumed that the benefits will equal the additional cost.

## (9) Indirect Benefits of Project

Indirect benefits of the projects are;

1) Effective land use of the existing Abasto Market

Wholesale function when transferred from Abasto Market to the NWM will create more space for other activities. These areas can now be more effectively used for retail activities and more streamline market operations. This will provide increased opportunities for direct retail activities by farmers and small traders in the informal sector.

The alleviation of the chaotic marketing activities and overcrowding at the existing Abasto Market will raise the efficiency of the marketing activities of small women traders who have traditionally conducted small transactions there.

2) Effective land use of the existing parking areas around Abasto Market

Reduction of wholesale traffic vehicles to Abasto will eliminate the need for parking area around Abasto Market. These areas could then be used for other activities more appropriate to the general characteristics of the area.

3) Social / Environment impact on existing market Abasto Market

Transfer of the wholesale activities from Abasto Market will have social impact on retailers or intermediaries that depend on these activities. These impact may be positive or negative depending on the affected party. Also, Abasto Market is expected to have a positive impact from the viewpoint of improved sanitary environment.

#### Spin-off economic activities around NWM

The introduction of the NWM will encourage other economic activities in the surrounding areas such as transport services, restaurants, ware-house, sundry stores, etc. These spin-off activities will create more job opportunities for the inhabitants.

Due to assistance from private firms, NGOs, and donor countries, farmers will not be limited to using the improved Abasto market, but will be able to participate in wholesale activities and to sell their products to wholesalers at the NWM, and thereby are given increased opportunities to raise their income.

#### 5) Reduce traffic congestion around Abasto Market

The NWM will divert the wholesale traffic from the Abasto Market thus reducing traffic congestion and improving traffic flow in the area.

## (10) Indirect Benefits to New Target Groups

In conjunction with the improvements to the traditional marketing system, new benefits will also be created for new target groups not utilizing the existing Abasto Market. The agricultural cooperatives of the lowlands (CAISY, CAICO) that wish to utilize the NWM, the Supermarket Association, and new farmer groups who wish to organize in order to participate in wholesale activities are just some of the new target groups pinpointed.

(11) Economic Benefit Distribution

## 1) Economic Benefits of the Collection and Distribution centers

The economic benefits of the Collection and Distribution centers are in terms of increase in production and commercialization, and producers time savings by eliminating the need to follow the products to the consumption markets. 100% of these benefits accrue to the producers.

2) Economic Benefits of the NWM

The economic benefits of the NWM are characterized by the opportunity cost in terms of transport time cost savings, producers / intermediaries time savings, wholesalers' porter charge savings, and consumer time savings.

	Producer /	Intermediary	Transporter	Wholesaler	Consumer	Total Benefits
1 City Entry Time Restriction	+ \$20,	+ 190	+ \$100,950			\$121,140
2 Space Restriction Inside Abasto Market	+ \$84,	+ 984	+ \$1,048,882			\$1,133,866
3 Selling from truck outside Abasto Market	+ \$320	+ ,927	+ \$313,099	+ 195,687		\$829,713
4 Reduction of Quality Loss for tomato	+ \$25,745					
5 Consumer time savings					+ \$240,383	\$240,383
6 Production Increase	+ \$1,623,559					\$1,623,559
7 Commercialization Rate Increase	+ \$469,290	· .	· .			\$469,290
Total Benefits (US\$) %		14,694 1%	\$1,462,931 33%	\$195,687 4%	\$240,383 5%	\$4,443,695 100%

#### Summary of Total Benefit Distribution by Target Group (2010)

Remark:

Wholesalers' additional benefit from NWM that is not reflected in the above table, will be 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. Benefit not reflected in the above table is that the NWM will also provide opportunity for new wholesalers to participate, not only those transferred from Abasto Market.

 Indirect benefit to retailers not reflected in the above table, will be more retailing space/ activities at Abasto after wholesale function removed to NWM.