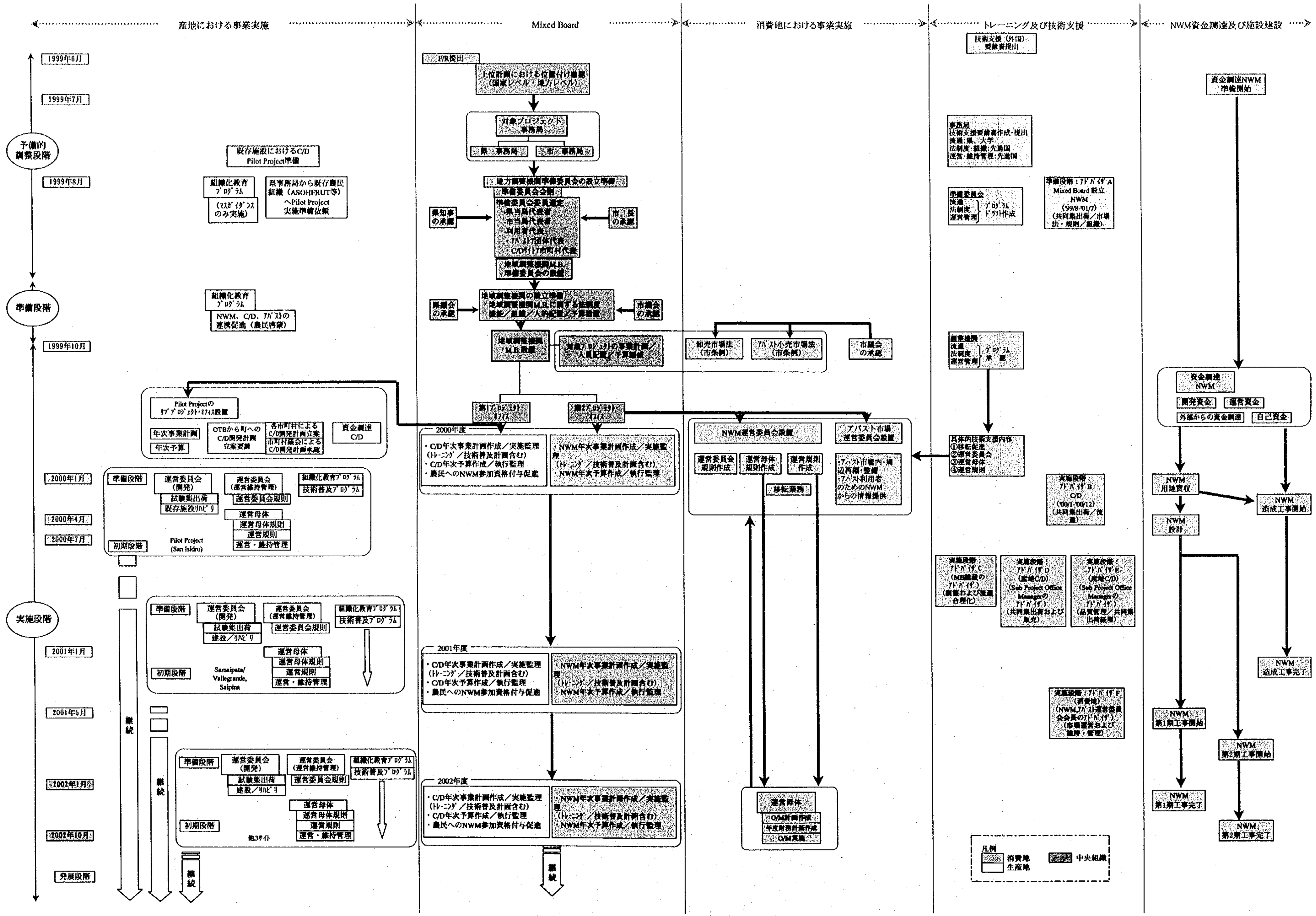


図9-2　対象プロジェクト実施のプロセス

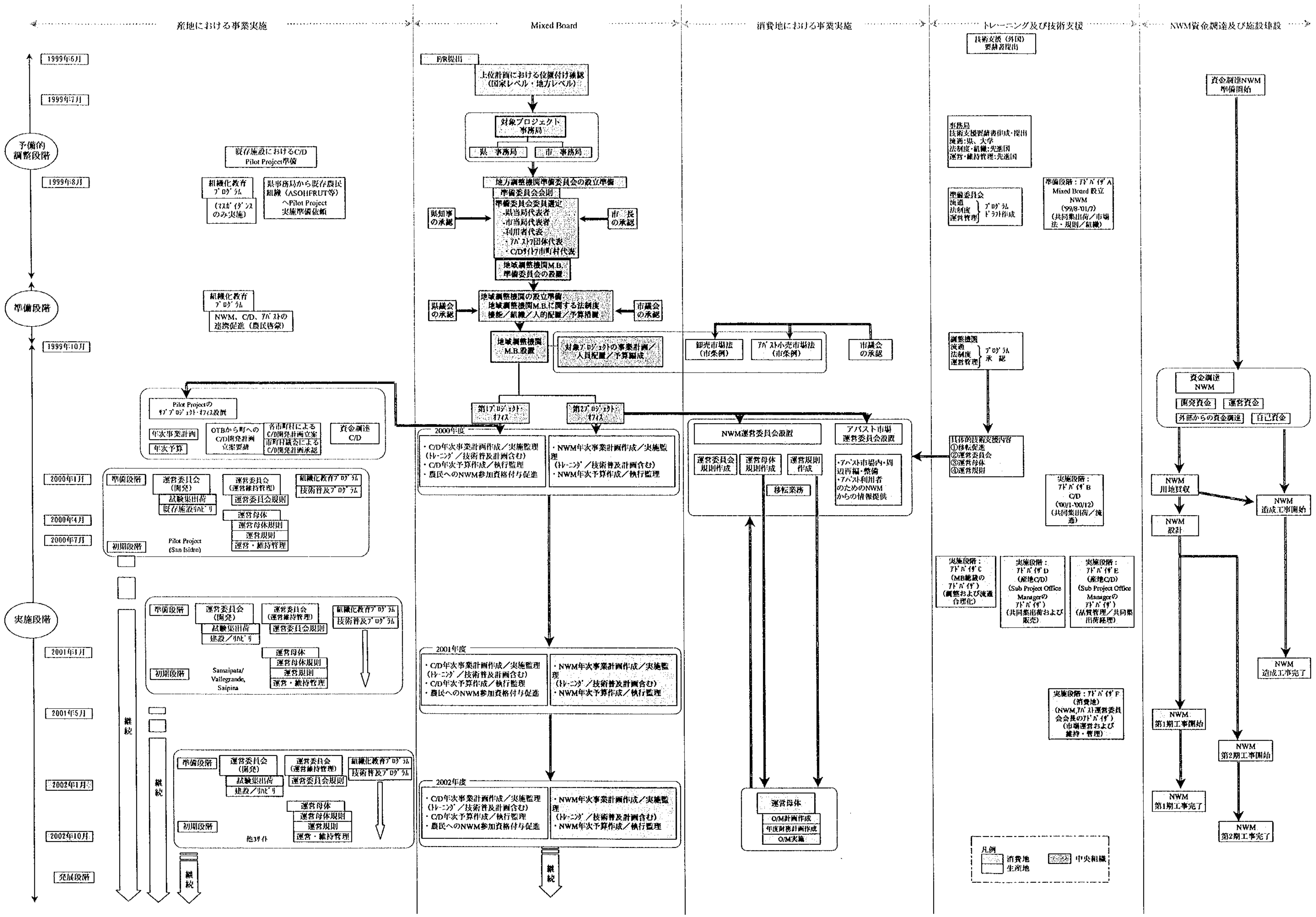


図9-2　対象プロジェクト実施のプロセス

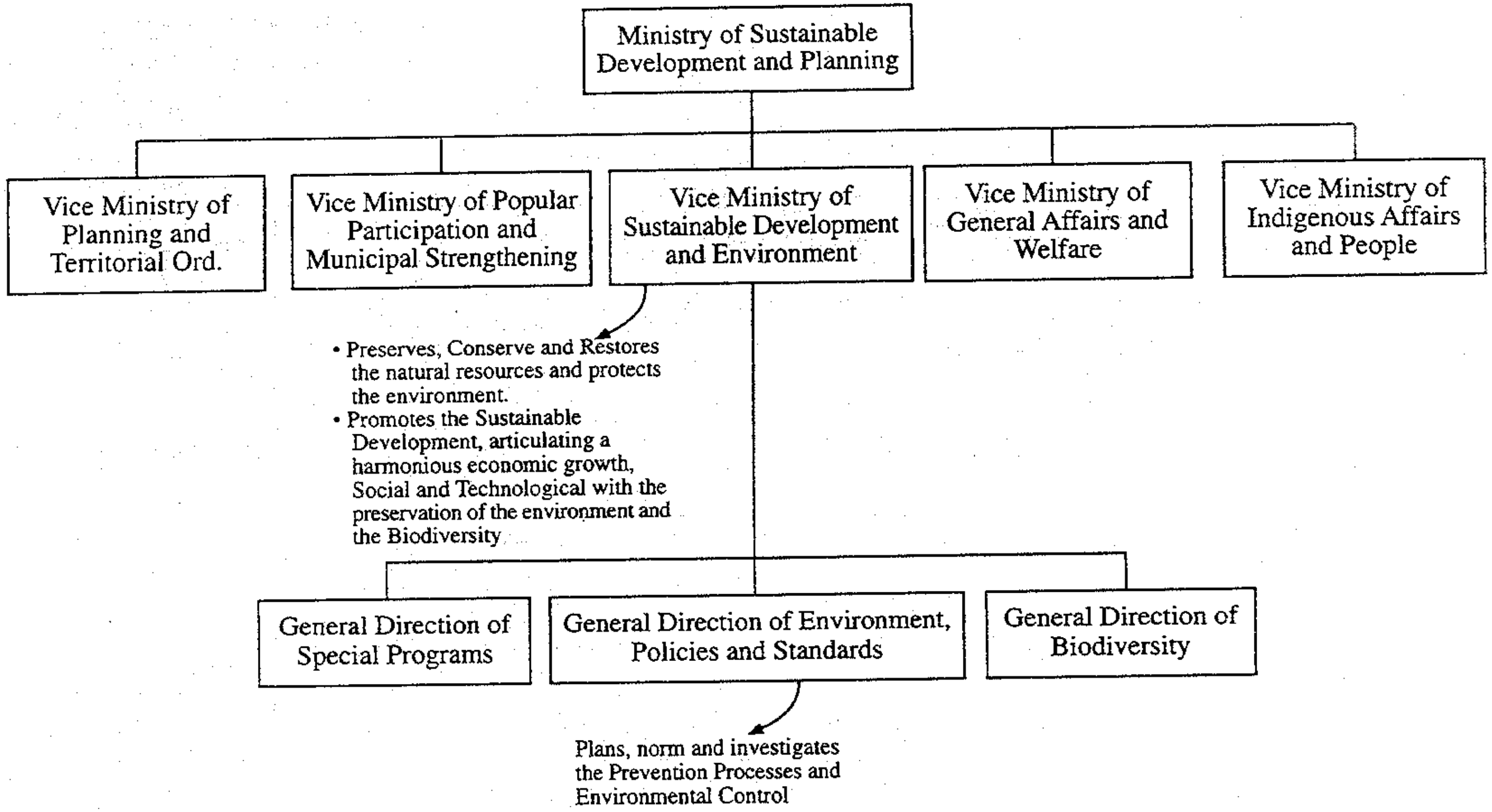
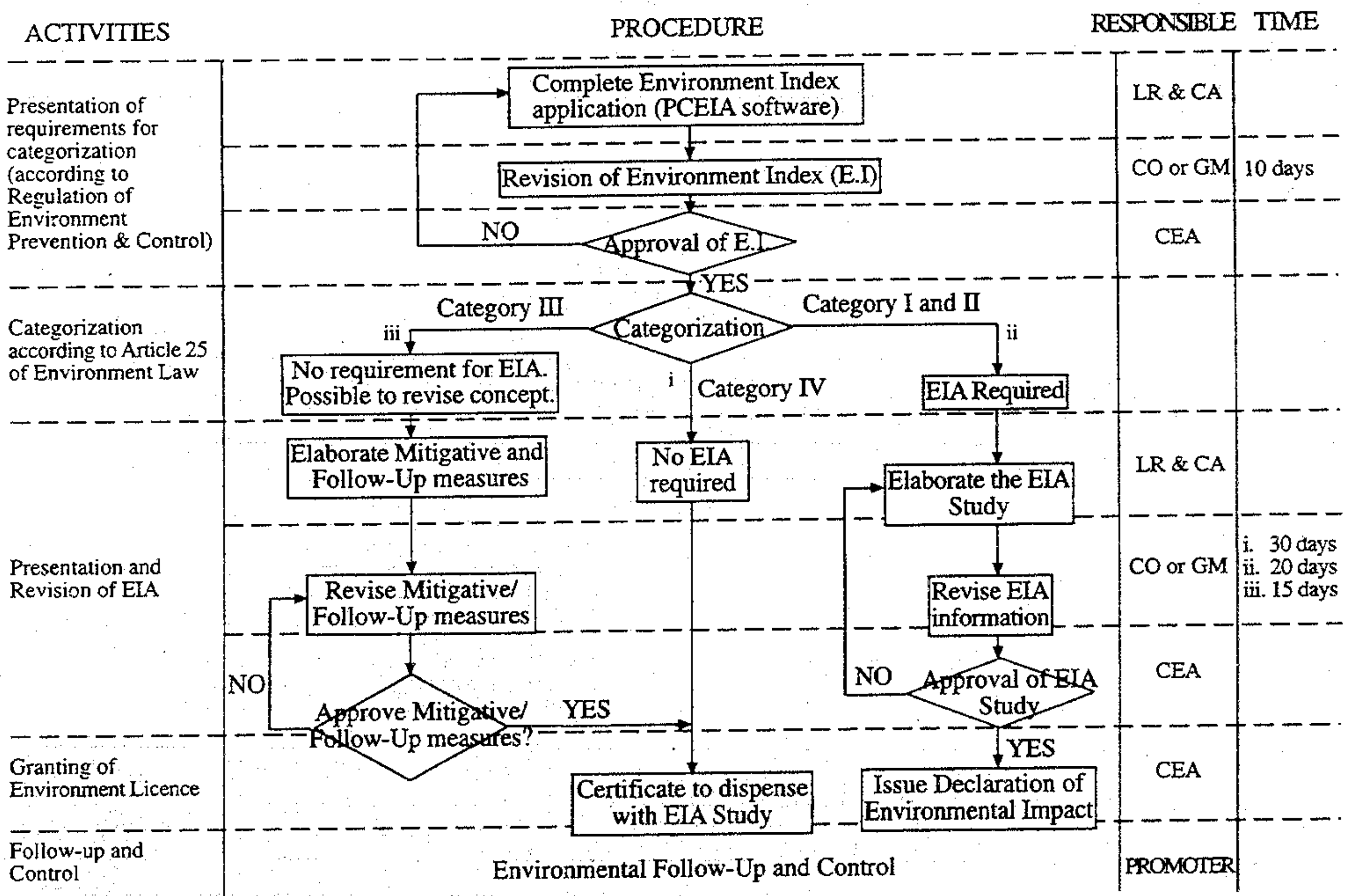


図 10-1 持続的開発計画省組織図



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

図 10-2 環境影響評価実施手続き

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

表 2-1　サンタクルス県内既存灌漑プロジェクト概要

Province	Gross Irrigation Command Area(ha)	No. of Beneficiaries	Irrigated Area per Beneficiary(ha)
Florida	1,317	907	1.5
Caballero	3,362	2,414	1.4
Vallegrande	1,832	1,208	1.5
Valley Area Total	**6,511**	**4,529**	**1.4**
Other Areas	2,955	1,518	1.9
Santa Cruz Total	**9,466**	**6,047**	**1.6**

Remarks
1. Project with canal irrigation system; source: Plan General de Riego, Department Santa Cruz, CORDECRUZ, 1994
2. "Mairana, Filadelfia/Mendiola" in Florida Province include pumping irrigation area
Source: Plan General de Riego, Department Santa Cruz, CORDECRUZ, 1994 and data presented by PRICRUZ

表 2-2　渓谷地の青果物生産・流通量と灌漑プロジェクト概要

Province	Products				Marketing Volume by Destination(ton)				No of Beneficiaries
	Irrigation area (ha)	Vegetables (ton)	Fruits (ton)	Total (ton)	St Cruz	Cochabamba	Local	Total	
(1)Florida	1,317	35,900	6,700	42,600	32,810	2,831	570	36,210	907
	(3,420)				*90%*	*8%*	*2%*	*100%*	
(2)Caballero	3,362	38,500	400	38,900	14,451	19,449	0	33,900	2,414
	(3,520)				*43%*	*57%*	*0%*	*100%*	
(3)Vallegrande	1,832	29,300	6,000	35,300	27,300	0	1,585	28,905	1,208
	(3,200)				*95%*	*0%*	*5%*	*100%*	
Total	6,511	103,700	13,100	116,800	74,581	22,280	2,155	99,015	4,529
	(10,140)								

Remark:
1. Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz, 1998.
2. ( ) signifies the cultivated areas of fruits and vegetables (incl. irrigated and non-irrigated)

表 2-3　渓谷地における計画段階の灌漑プロジェクト概要

	Areas to be irrigated (ha)			
	Rehabilitation	Expansion	Total	No of Beneficiaries
(1)Florida	317	1,425	1,742	740
(2)Caballero	3,132	1,193	4,325	1,670
	(1755)	(590)	(2345)	
(3)Vallegrande	70	279	349	124
Total	3,519	2,897	6,416	2,534

Remark:
1. Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz, 1998.
2. ( ) signifies the areas to be covered by the "Irrigation Development Project under Comarapa-Saipina-San Rafael" by KFW.

表 2-4　渓谷地の農産物生産現況（1997年）

	Florida Province		Caballero Province		Vallegrande Province		
	Production		Production		Production		Production
Crops	(000t)	Share(%)	(000t)	Share(%)	(000t)	Share(%)	(000t)
1. Cereals & Beans							
Maize	33.0	47	4.4	6	33.0	47	70.4
Wheat			1.0	25	3.0	75	4.0
Beans	1.5	65			0.8	35	2.3
Others	0.5	50	0.2	20	0.3	30	1.0
Sub-total	35.0	45	5.6	7	37.1	48	77.7
2. Vegetables							
Potatoes	15.0	28	16.7	31	22.0	41	53.7
Tomato	8.5	34	12.8	51	3.8	15	25.1
Lettuce	8.0	100					8.0
Choclo			1.3	100			1.3
Others	4.4	28	7.7	49	3.5	22	15.6
Sub-total	35.9	35	38.5	37	29.3	28	103.7
3. Fruits							
Peach	2.5	56			2.0	44	4.5
Plum					1.0	100	1.0
Citrus	2.5	100					2.5
Others	1.7	33	0.4	8	3.0	59	5.1
Sub-total	6.7	51	0.4	3	6.0	46	13.1
4. Others							
Tobbaco	0.8	100					0.8
Sugarcane	4.0	15	15.0	56	8.0	30	27.0
Sub-total	4.8	17	15.0	54	8.0	29	27.8
Total	82.4	-	59.5	-	80.4	-	222.3

Remarks:
1. "Others" in 1. Cereals & Beans include groundnut & others
2. "Others" in 2. Vegetables include green pepper, beans, peas, cabbage, onion, carrot etc.
3. "Others" in 3. Fruits include plum, grapee, apple, cherimoya

Source:
Florida: Plan Participativo de Desarrollo Municipal Sostenible, 1997, Municipal de Samaipata
Data presented by CIAT & ASOFRUT, Mairana
Data presented by CIAT & municipal office, Pampa Grande
Caballero: Data presented byy PRICRUZ
Estudio de Pre-factibilidad Proyekto Riego Puluquina Arriba-San Isidro-Puluquina Abajo, 1992, CORDECRUZ
Data presented by CIAT/ASOFRUT, San Isidro
Vallegrande: Plan Participativo de Desarrollo Municipal 1998 - 2002, Municipal de Vallegrande
Data prsented by CIAT, Vallegrande

表 2-5　渓谷地の青果物流通現況（1997年）

Commodity	Items	Province			Valley Region Total
		Florida	Caballero	Vallegrande	
Potatoes	Production(t)	15,000	16,700	22,000	53,700
	Commercialization Rate(%)	85	90	80	85
	Marketing Volume(t)	12,750	15,030	17,600	45,380
	Destination Market: Share(%)				
	St. Cruz(%)	100	50	100	83
	Cochabamba(%)	0	50	0	17
	Local(%)	0	0	0	0
	Destination Market:Volume(t)				
	St. Cruz(t)	12,750	7,515	17,600	37,865
	Cochabamba(t)	0	7,515	0	7,515
	Local(t)	0	0	0	0
Tomato	Production(t)	8,500	12,800	3,800	25,100
	Commercialization Rate(%)	85	85	85	85
	Marketing Volume(t)	7,225	10,880	3,230	21,335
	Destination Market: Share(%)				
	St. Cruz(%)	90	20	95	55
	Cochabamba(%)	10	80	0	44
	Local(%)	0	0	5	1
	Destination Market:Volume(t)				
	St. Cruz(t)	6,503	2,176	3,069	11,747
	Cochabamba(t)	723	8,704	0	9,427
	Local(t)	0	0	162	162
Other Vegetables	Production(t)	12,400	9,000	3,500	24,900
	Commercialization Rate(%)	85	85	85	85
	Marketing Volume(t)	10,540	7,650	2,975	21,165
	Destination Market: Share(%)				
	St. Cruz(%)	80	60	95	75
	Cochabamba(%)	20	40	0	24
	Local(%)	0	0	5	1
	Destination Market:Volume(t)				
	St. Cruz(t)	8,432	4,590	2,826	15,848
	Cochabamba(t)	2,108	3,060	0	5,168
	Local(t)	0	0	149	149
Fruits	Production(t)	6,700	400	6,000	13,100
	Commercialization Rate(%)	85	85	85	85
	Marketing Volume(t)	5,695	340	5,100	11,135
	Destination Market: Share(%)				
	St. Cruz(%)	90	50	75	82
	Cochabamba(%)	0	50	0	2
	Local(%)	10	0	25	17
	Destination Market:Volume(t)				
	St. Cruz(t)	5,126	170	3,825	9,121
	Cochabamba(t)	0	170	0	170
	Local(t)	570	0	1,275	1,845
Total	Production(t)	42,600	38,900	35,300	116,800
	Commercialization Rate(%)	85	87	82	85
	Marketing Volume(t)	36,210	33,900	28,905	99,015
	Destination Market: Share(%)				
	St. Cruz(%)	91	43	95	75
	Cochabamba(%)	8	57	0	23
	Local(%)	2	0	5	2
	Destination Market:Volume(t)				
	St. Cruz(t)	32,810	14,451	27,320	74,581
	Cochabamba(t)	2,831	19,449	0	22,280
	Local(t)	570	0	1,585	2,155

Source: Results of study by JICA Study Team, 1998

表 2-6　サンタクルス県における計画段階の灌漑プロジェクト概要

Province	Municipality	Gross Irrigation Command Area(ha) Rehabilitation	Expansion	Total	No. of Beneficiaries (households)
Florida	Mairana	317	1,425	1,742	740
Caballero	Comarapa & Saipina	3,132	1,193	4,325	1,670
Vallegrande		70	279	349	124
Valley Region Total		**3,519**	**2,897**	**6,416**	**2,534**
Cordillera		**2,615**		**2,615**	**636**
Santa Cruz Department Total		**6,134**	**2,897**	**9,031**	**3,170**

Source: Plan General de Riego Department de Santa Cruz, 1996, Lahmeyer International-Arcotrass-SID SRL.

表 2-7　主要産地の農作物作付・生産現況（1997年）

Crops	Florida						Comarapa						Vallegrande	
	Samaipata Area		Mairana Area		Pampa Grande Area		Comarapa Area		San Isidro Area		Saipina Area		Vallegrande Area	
	Cropped Area (ha)	Production (t)	Cropped Area (ha)	Production (t)	Cropped Area (ha)	Production (t)	Cropped Area (ha)	Production (t)	Cropped Area (ha)	Production (t)	Cropped Area (ha)	Production (t)	Cropped Area (ha)	Production (t)
1. Cereals & Beans														
Maize	2,900	6,380	6,200	13,640	2,500	5,500	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	6,200	13,640
Wheat							n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	900	1,080
Beans	1,100	1,650	700	1,050	500	750	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
Others	50	50	100	100	100	100	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
Sub-total	4,050	8,080	7,000	14,790	3,100	6,350			0	0	0	0	7,100	14,720
2. Vegetables														
Potatoes	470	5,170	140	1,680	300	3,600	290	3,190	500	6,000	680	7,480	900	9,900
Tomato	70	1,050	110	1,650	240	4,080	100	1,700	220	3,740	430	7,310	100	1,500
Lettuce	50	1.000	110	2,200	240	4,800								
Choclo									220	1,320				
Others	30	150	100	1,000	420	2,100	210	1,050	490	4,900	340	1,700	50	500
Sub-total	620	7,370	460	6,530	1,200	14,580	600	5,940	1,430	15,960	1,450	16,490	1,050	11,900
3. Fruits														
Peach	30	300	110	1,100	50	500							120	1,200
Plum													50	500
Citrus	100	1,000	50	500	80	800								
Others	60	600	90	900			40	400					180	1,800
Sub-total	190	1,900	250	2,500	130	1,300	40	400	0	0	0	0	350	3,500
4. Others														
Tobbaco	760	1.060	400	560			n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
Sugarcane					30	1,200	n.a.	n.a.	n.a.	n.a.	250	15,000	200	8,000
Others	80	3,200					n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
Sub-total	840	4,260	400	560	30	1,200			0	0	250	15,000	200	8,000
Total	5,700	21,610	8,110	24,380	4,460	23,430	640	6,340	1,430	15,960	1,700	31,490	8,700	38,120

Remarks 1: Samaipata, Mairana, Pampa Grnade, Saipina & Vallegrande: cropped area and production in the whole municipality

Remarks 2:Comarapa: cropped area and production in Comarapa municipality excluding those in San Isidro Area; San Isidro: cropped area and production in irrigated areas in San Isidro and Pulquina

Remarks 3: "Other" in 1.Cereals & beans include groundnut & others

Remarks 4: "Others" in 2. Vegetables include green pepper, beans, peas, cabbage, onion, carrot etc.

Remarks 5: "Others" in 3. Fruits include grape, apple

Remarks 6: "Others" in 4. Others include sugarcane, cassava etc.

Source:
Samaipata: Plan Participativo de Desarrollo Municipal Sostenible, 1997, Municipal de Samaipata
Pampa Grande: Data presented by CIAT & municipal office, Pampa Grande
Comarapa & Saipina: Data presented by PRICRUZ
San Isidro: Estudio de Pre-factibilidad Proyekto Riego Puluquina Arriba-San Isidro-Puluquina Abajo, 1992, CORDECRUZ; Data presented by CIAT/ASOFRUT, San Isidro
Vallegrande: Plan Participativo de Desarrollo Municipal 1998 - 2002, Municipal de Vallegrande; Data presented by CIAT, Vallegrande

表 2-8　主要産地の青果物流通の現況（1997年）

Commodity		Florida			Caballero			Vallegrande
		Samaipata	Mairana	Pampa Grande	Comarapa	San Isidro	Saipina	Vallegrande
Potatoes	Production(t)	5,170	1,680	3,600	3,190	6,000	7,480	9,900
	Commercialization(%)	80	80	90	80	90	90	80
	Marketing Volume(t)	4,136	1,344	3,240	2,552	5,400	6,732	7,920
	Destination Market:Share(%)							
	St. Cruz(%)	100	100	100	60	70	30	100
	Cochabamba(%)	0	0	0	40	30	70	0
	Local(%)	0	0	0				0
	Destination Market:Volume(t)							
	St. C St. Cruz(t)	4,136	1,344	3,240	1,531	3,780	2,020	7,920
	Cocl Cochabamba(t)	0	0	0	1,021	1,620	4,712	0
	Loca Local(t)	0	0	0	0	0	0	0
Tomato	Production(t)	1,050	1,650	4,080	1,700	3,740	7,310	1,500
	Commercialization(%)	85	85	85	85	85	85	85
	Marketing Volume(t)	893	1,403	3,468	1,445	3,179	6,214	1,275
	Destination Market:Share(%)							
	St. Cruz(%)	100	80	90	50	30	5	95
	Cochabamba(%)	0	20	10	50	70	95	0
	Local(%)	0	0	0	0	0	0	5
	Destination Market:Volume(t)							
	St. C St. Cruz(t)	893	1,122	3,121	723	954	311	1,211
	Cocl Cochabamba(t)	0	281	347	723	2,225	5,903	0
	Loca Local(t)	0	0	0	0	0	0	64
Other Vegetables	Production(t)	1,150	3,200	6,900	1,050	6,220	1,700	500
	Commercialization(%)	85	85	85	85	85	85	85
	Marketing Volume(t)	978	2,720	5,865	893	5,287	1,445	425
	Destination Market:Share(%)							
	St. Cruz(%)	100	100	70	60	60	70	95
	Cochabamba(%)	0	0	30	40	40	30	0
	Local(%)	0	0	0	0	0	0	5
	Destination Market:Volume(t)							
	St. C St. Cruz(t)	978	2,720	4,106	536	3,172	1,012	404
	Cocl Cochabamba(t)	0	0	1,760	357	2,115	434	0
	Loca Local(t)	0	0	0	0	0	0	21
Fruits	Production(t)	1,900	2,500	1,300	400			3,500
	Commercialization(%)	85	85	85	85			85
	Marketing Volume(t)	1,615	2,125	1,105	340	0	0	2,975
	Destination Market:Share(%)							
	St. Cruz(%)	90	100	60	50			75
	Cochabamba(%)	0	0	0	50			0
	Local(%)	10	0	40	0			25
	Destination Market:Volume(t)							
	St. C St. Cruz(t)	1,454	2,125	663	170			2,231
	Cocl Cochabamba(t)	0	0	0	170			0
	Loca Local(t)	162	0	442	0			744
Total	Production(t)	9,270	9,030	15,880	6,340	15,960	16,490	15,400
	Commercialization(%)	82	84	86	82	87	87	82
	Marketing Volume(t)	7,621	7,592	13,678	5,230	13,866	14,391	12,595
	Destination Market:Share(%)							
	St. Cruz(%)	98	96	81	57	57	23	93
	Cochabamba(%)	0	4	15	43	43	77	0
	Local(%)	2	0	3	0	0	0	7
	Destination Market:Volume(t)							
	St. C St. Cruz(t)	7,460	7,311	11,130	2,959	7,906	3,342	11,766
	Cocl Cochabamba(t)	0	281	2,106	2,270	5,960	11,049	0
	Loca Local(t)	162	0	442	0	0	0	829

Source:　Results of study by JICA Study Team, 1998

表 2-9　主要産地の主要営農施設

Major Pproducing Areas	Facility	Constructed	Possesion	Capacity	Operation & Management	Use/Remarks
Samaipata Area	Collection facility	1985	ASOFRUT		ASOFRUT	Rented out for storage of food stuff under PAIS program
	Fruit processing facility (only building)	1994	ASOFRUT		ASOFRUT	Not used: trial production of fruit jam & marmalade in 1996 under the guidance of JOCV
	Local open market	-	Municipal government	-	Municipal government	Opened aily
Mairana Area	Corn flour mill	1978	Private	400 t/day	Private	Commercial operation
	Tobbaco collection center	-	Private	-	Private	Operation from April to July
	Municipal market	1978	Municipal government	2900m2	Municipal government	Open mainly on Sunday; oresently under renovation
Pampa Grande Area	Wheat seed processing facility	-	Private	-	Private	Commercial operation
	Local open market	-	Municipal government	-	Municipal government	Daily; operation started in August 1998
	Municipal market	1999	Municipal government	130 plots	Municipal government	2 story building in Los Negros; construction suspended because of objection of residents of Los Negros
Comarapa Area	Municipal market	-	Municipal government	-	Municipal government	Daiily
	Warehouse	-	EMCA	-	EMCA	Storage of farm inputs
San Isidro Area	Collection facility	1983	PETHOSAN		San Isidro sub-municality	Not used; originally constructed for tomato processing use of facility entrusted to San Isidro in 1993 for 5 years
	Municipal market	-	Municipal government	-	Municipal government	Daily
	Local open market	-	Municipal government	-	Municipal government	Daily; operation started in August 1998
Saipina Area	Municipal market	-	Municipal government	-	Municipal government	Daily
	Brown sugar processing facility		Individual		Individual	About 30 in total
Vallegrande Area	Farmers market(retail market)	1993	Municipal government	800m2	Municipal government	Saturday & Sunday
	Local open market	-	Municipal government	-	Municipal government	Daily; 2 markets in municipal

Source: Information provided by representatives of producers, agriculture institutions & municipal offices(JICA Study findings, 1998)

表 2-10 サンタクルス県郡別人口

	1995	1996	1997
1. Andre Ibanez	927,197	967,590	1,009,379
1) Santa Cruz City	838,464	874,991	912,781
		(+4.32%)	(+4.32%)
2) Others	88,733	92,599	96,598
2. Valley area	66,416	65,924	65,414
1) Vallegrande	27,098	26,899	26,692
2) Florida	22,769	22,512	22,250
3) Caballero	16,549	16,513	16,472
3. Others	558,941	568,002	577,158
Santa Cruz Dept.	1,552,554	1,601,516	1,651,951
		(+3.15%)	(+3.15%)

Source: Anuario Estadistico 1997, Instituto Nacional de Estadistica (INE)

表 2-11 サンタクルス県の青果物需要と供給（1994年）

	Supply			Demand			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	94	0	94	22	20	42	+52
Low land	292	6	298	183	77	260	+38
SC City	0	143	143	233	0	233	-90
Total	386	149	535	438	97	535	0

Source: JICA Study Team, 1994

表 2-12 サンタクルス県の根菜類需要と供給（1994年）

	Supply			Demand			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	25	0	25	14	4	18	+7
Low land	162	3	165	87	68	155	+10
SC City	0	35	35	52	0	52	-17
Total	187	38	225	153	72	225	0

Source: JICA Study Team, 1994

表 2-13 サンタクルス県の野菜類需要と供給（1994年）

	Supply			Demand			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	61	0	61	5	15	20	+41
Low land	23	2	25	22	0	22	+3
SC City	0	39	39	83	0	83	-44
Total	84	41	125	110	15	125	0

Source: JICA Study Team, 1994

表 2-14　サンタクルス県の果物類需要と供給（1994年）

	Supply			Demand			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	8	0	8	3	1	4	+4
Low land	107	1	108	74	9	83	+25
SC City	0	69	69	98	0	98	-29
Total	115	70	185	175	10	185	0

Source: JICA Study Team, 1994

表 2-15　サンタクルス県の青果物需要と供給（1998年）

Unit: 1,000 tons

	Supply			Demand			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	117	0	117	21	22	43	+74
Low land	362	0	362	212	93	305	+57
External	-	13	13	-	-	-	+13
SC City	0	143	143	287	0	287	-144
Total	479	156	635	520	125	635	0

Source: JICA Study Team, 1998

表 2-16　サンタクルス県の根菜類需要と供給（1998年）

Unit: 1,000 tons

	Supply			Demand			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	54	0	54	13	8	21	+33
Low land	192	0	192	101	76	177	+15
External	-	12	12	-	-	-	+12
SC City	0	17	17	64	0	64	-47
Total	250	29	275	116	84	267	+13

Source: JICA Study Team, 1998

表 2-17　サンタクルス県の野菜類需要と供給（1998年）

Unit: 1,000 tons

	Supply			Demand			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	50	0	50	5	14	19	+31
Low land	21	0	21	25	0	25	-4
External	-	0	0	-	0	0	0
SC City	0	65	65	102	0	102	-37
Total	71	65	136	132	14	146	-10

Source: JICA Study Team, 1998

表 2-18　サンタクルス県の果物類需要と供給（1998年）

Unit: 1,000 tons

	Supply			Demand			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	13	0	13	3	0	3	+10
Low land	149	0	149	86	17	103	+46
External	-	1	1	-	-	-	+1
SC City	0	61	61	121	0	121	-60
Total	162	62	224	210	17	227	-3

Source: JICA Study Team, 1998

表 2-19　サンタクルス県の青果物生産地と仕向け地（1994年）

Unit: 1,000 tons

	Valley	Low land	SC City	Sub-total	Outside SC	Export	Total
Valley	22	0	52	74	20	0	94
Low land	0	177	38	215	77	0	292
SC City	0	5	0	5	0	0	5
Sub-total	22	182	90	294	97	0	391
Outside SC	0	1	143	144	-	0	1440
Total	22	183	233	438	97	0	535

Source: JICA Study Team, 1994

表 2-20　サンタクルス県の根菜類生産地と仕向け地（1994年）

Unit:1,000 tons

	Valley	Low land	SC City	Sub-total	Outside SC	Export	Total
Valley	14	0	7	21	4	0	25
Low land	0	84	10	94	68	0	162
SC City	0	2	0	2	0	0	2
Sub-total	14	86	17	117	72	0	189
Outside SC	0	1	35	36	-	0	36
Total	14	87	52	153	72	0	225

Source: JICA Study Team, 1994

表 2-21　サンタクルス県の野菜類生産地と仕向け地（1994年）

Unit:1,000 tons

	Valley	Low land	SC City	Sub-total	Outside SC	Export	Total
Valley	5	0	41	46	15	0	61
Low land	0	20	3	23	0	0	23
SC City	0	2	0	2	0	0	2
Sub-total	5	22	44	71	15	0	86
Outside SC	0	0	39	39	-	0	39
Total	5	22	83	110	15	0	125

Source: JICA Study Team, 1994

表 2-22　サンタクルス県の果物類生産地と仕向け地（1994年）

Unit: 1,000 tons

	Valley	Low land	SC City	Sub-total	Outside SC	Export	Total
Valley	3	0	4	7	1	0	8
Low land	0	73	25	98	9	0	107
SC City	0	1	0	1	0	0	1
Sub-total	3	74	29	106	10	0	116
Outside SC	0	0	69	69	-	0	69
Total	3	74	98	175	10	0	185

Source: JICA Study Team, 1994

表 2-23　サンタクルス県の青果物生産地と仕向け地（1998年）

Unit: 1,000 tons

	Valley	Low land	SC City	Sub-total	Outside SC	Export	Total
Valley	21	0	72	93	24	0	117
Lowland	0	212	59	271	91	0	362
SC City	0	0	0	0	0	0	0
Sub-total	21	212	131	364	115	0	479
Outside SC	0	0	143	143	-	0	143
Import	0	0	13	13	0	-	13
Total	21	212	287	520	115	0	635

Source: JICA Study Team, 1998

表 2-24　サンタクルス県の根菜類生産地と仕向け地（1998年）

Unit: 1,000 tons

	Valley	Low land	SC City	Sub-total	Outside SC	Export	Total
Valley	13	0	17	30	5	0	35
Low land	0	101	10	111	81	0	192
SC City	0	0	0	0	0	0	0
Sub-total	13	101	27	141	86	0	227
Outside SC	0	0	26	26	-	0	26
Import	0	0	12	12	0	-	12
Total	13	101	65	179	86	0	265

Source: JICA Study Team, 1998

表 2-25　サンタクルス県の野菜類生産地と仕向け地（1998年）

Unit: 1,000 tons

	Valley	Low land	SC City	Sub-total	Outside SC	Export	Total
Valley	5	0	51	56	13	0	69
Low land	0	25	8	33	5	0	38
SC City	0	0	0	0	0	0	0
Sub-total	5	25	59	89	18	0	107
Outside SC	0	0	43	43	-	0	43
Import	0	0	0	0	0	-	0
Total	5	25	102	132	18	0	150

Source: JICA Study Team, 1998

表 2-26　サンタクルス県の果物類生産地と仕向け地（1998年）

Unit: 1,000 tons

	Valley	Low land	SC City	Sub-total	Outside SC	Export	Total
Valley	3	0	4	7	6	0	13
Low land	0	86	41	127	5	0	132
SC City	0	0	0	0	0	0	0
Sub-total	3	86	45	134	11	0	145
Outside SC	0	0	74	74	-	0	74
Import	0	0	1	1	0	-	1
Total	3	86	120	209	11	1	220

Source: JICA Study Team, 1998

表 2-27　アバスト市場流入青果物の品目別季節変動（1998年）

Unit: tons/week

	1st Phase Study August 1998					2nd Phase Study November 1998				
Product	Valley	Lowland	Outside SC	Import	**Total**	Valley	Low land	Outside SC	Import	**Total**
Potato	209	155	78	240	**682 (21.1%)**	197	-	63	791	**1,051 (39.1%)**
Tomato	114	67	-	-	**181 (5.6%)**	188	-	2	-	**190 (7.0%)**
Pimenton	3	3	-	-	**6 (0.2%)**	15	-	-	-	**15 (0.5%)**
Onion	16	23	604	-	**643 (19.9%)**	-	-	54	-	**54 (2.0%)**
Lettuce	222	-	-	-	**222 (6.9%)**	36	-	-	-	**36 (1.3%)**
Other vegetables	190	138	108	-	**436 (13.5%)**	107	20	149	-	**276 (10.3%)**
Banana (Platano)	-	143	623	-	**766 (23.7%)**	42	238	620	-	**900 (33.4%)**
Pineapple	-	7	-	-	**7 (0.2%)**	-	13	68	-	**81 (3.0%)**
Watermelon	-	25	70	-	**95 (2.9%)**	34	2	-	-	**36 (1.3%)**
Other fruits	20	88	81	4	**193 (6.0%)**	-	40	6	6	**52 (2.0%)**
Total	774 (24.0%)	649 (20.1%)	1,564 (48.4%)	244 (7.6%)	**3,231 (100%)**	619 (22.9%)	313 (11.6%)	962 (35.7%)	797 (29.6%)	**2,691 (100%)**

Remark: The data of 2nd phase study is multiplied 3.5 for two days' inflow volume. The data of 1st phase study is for successive 7 days' inflow volume.
Source: JICA Study Team, November and August 1998

表 2-28　アバスト市場入場トラックの積載重量別台数比率

Unit: %

	Less than 5 tons	5 to 10 tons	10 to 20 tons	20 to 30 tons	Total
1st phase study	49.4	18.9	15.1	16.6	100
2nd phase study	50.0	19.4	16.7	13.9	100

Source: JICA Study Team, August and November 1998

表 2-29　アバスト市場入場トラックの出発地別・積載重量別台数

	Less than 5 tons	5 to 10 tons	10 to 20 tons	20 to 30 tons	Total
Valley	22	10	1	2	35 (32.4%)
Low land	5	3	5	2	15 (13.9%)
Outside SC	26	5	8	3	42 (38.9%)
Import	1	3	4	8	16 (14.8%)
Total	54(50.0%)	21(19.4%)	18(16.7%)	15(13.9%)	108 (100%)

Source: JICA Study Team, November 1998

表 2-30　アバスト市場入荷青果物の配分先

Unit: tons/week

Year	Wholesalers in Abasto	Retailers in Abasto	Retailers in other market	Sub-total	Public consumers	Supermarket	Institution	Intermediary outside SC	Total
1994	1,977 (74.6%)	199 (7.5%)	117 (4.4%)	2,313 (87.3%)		358 (14.0%)			2,651 (100%)
1998	2,119 (65.5%)	585 (18.1%)	294 (9.1%)	2,998 (92.8%)	211 (6.5%)	5 (0.2%)	2 (0.1%)	15 (0.5%)	3,231 (100%)

Source: JICA Study Team, June 1994 and August 1998

表 2-31　アバスト市場卸売業者からの青果物配分先

Unit: tons/week

Year	Retailers in Abasto	Retailers in other market	Sub-total	Public consumers	Supermarket	Institutions	Outside SC	Total
1994	312 (15.6%)	1,349 (67.6%)	1,661 (83.2%)	226 (11.3%)	20 (1.0%)		90 (4.5%)	1,997 (100%)
1998	1,127 (53.2%)	451 (21.3%)	1,578 (74.5%)	449 (21.2%)	32 (1.5%)	43 (2.0%)	17 (0.8%)	2,119 (100%)

Source: JICA Study Team, June 1994 and August 1998

表 2-32　サンタクルス市場の青果物卸売価格の変動（1996年1月から1997年12月まで）

Commodity	Unit	Max. price (Bs.)	Min. price (Bs.)	Max./Min.
Potato (Hollandesa)	@	23.53	8.67	2.71
Cassava	@	14.00	5.44	2.57
Lettuce	Basket ,3@	78.33	16.70	**4.69**
Pimenton	Bag, 20x12	74.77	21.76	3.44
Tomato (Pera)	Box, 18 kg	64.44	7.63	**8.45**
Tomato (Manz)	Box, 20 kg	71.39	11.95	**5.97**
Peas	@	33.09	9.31	3.55
Cabbage	Bag, 50-60	70.00	27.73	2.52
Onion	15@	443.86	80.06	**5.54**
Mandarin	100 pieces	57.50	12.00	**4.79**
Pineapple (Large)	100 pieces	280.00	200.00	1.4
Watermelon	100 pieces	731.54	458.82	1.59
Peach (Samaipata)	@	56.67	45.00	1.25
Apple (Argentine)	Box, 198 pieces	160.00	92.50	1.73
Apple (Chile)	Box, 200 pieces	136.00	83.81	1.62

Source: Numeros de Nuestra Tierra, 1998, CAO; Santa Cruz – Bolivia
Remarks: @ means arroba. (11.5 kg)

表 2-33　アバスト市場入場トラックの時間帯別台数

Hour	August 1998 1st phase study	November 1998 2nd phase study
0 to 6	145 (37 %)	172 (45 %)
6 to 12	64 (17 %)	63 (17 %)
12 to 18	124 (31 %)	112 (30 %)
18 to 24	61 (15 %)	31 (8 %)
Total	394 (100%)	378 (100%)

Remarks: The data of August 1998 is the number of trucks for successive 7 days. The data of November 1998 is for 2 days and recalculated for 7days equivalent for the convenience of comparison.
Source: JICA Study Team, August and November 1998

表 2-34　アバスト市場入場トラックの出発地別・時間帯別台数

Hour	0 to 6	6 to 12	12 to 18	18 to 24	Total
Valley	16	8	8	3	35 (32 %)
Low land	5	3	4	3	15 (14 %)
Outside SC	17	7	16	2	42 (39 %)
Import	11	0	3	2	16 (15 %)
Total	49(45 %)	18(17 %)	31(29 %)	10(9 %)	108 (100%)

Source: JICA Study Team, November 1998

表 2-35　深夜から午前6時までのアバスト入場トラックの出発地別・積載重量別台数

	Less than 5 tons	5 to 10 tons	10 to 20 tons	20 to 30 tons	Total
Valley	10	3	2	0	15 (31 %)
Low land	1	2	2	0	5 (10 %)
Outside SC	4	3	4	4	15 (30 %)
Import	1	2	3	8	14 (29 %)
Total	16 (33 %)	10 (20 %)	11 (22 %)	12 (25 %)	49 (100%)

Source: JICA Study Team, November 1998

表 2-36　メルコスールおよびアンデス条約加盟国のジャガイモとトマト生産量と生産性

	Potato Production Q'ty (1,000 tons)	Potato Productivity (Ton/ha)	Tomato Production Q'ty (1,000 tons)	Tomato Productivity (Ton/ha)
Argentine	2,000	20.0	740	30.8
Bolivia	**725**	**5.6**	**46**	**10.2**
Brazil	2,699	14.3	2,639	43.5
Chile	828	13.8	1,370	63.0
Columbia	2,594	16.4	300	23.4
Paraguay	2	6.1	43	37.0
Peru	2,265	9.8	214	32.0
USA	22,549	39.0	11,700	60.7

Source: FAO Production Yearbook 1996 (Vol.50)

表 2-37　アルゼンチン・ブエノスアイレス中央市場における青果物価格（1998年）

Unit: Upper column, Pesos/kg; Lower column, Bs./kg equivalent

	POTATO	TOMATO	ONION	CARROT	BANANA	CITRUS	PINE-APPLE	PEACH
Jan.	0.12	0.36	0.18	0.16	0.44	0.24	0.71	0.53
	(0.67)	(2.02)	(1.01)	(0.90)	(2.46)	(1.34)	(3.98)	(2.97)
Feb.	0.11	0.31	0.21	0.13	0.57	0.33		0.76
	(0.62)	(1.74)	(1.18)	(0.73)	(3.19)	(1.85)		(4.26)
Mar.	0.1	0.34	0.20	0.15	0.45	0.44		0.94
	(0.56)	(1.90)	(1.12)	(0.84)	(2.52)	(2.46)		(5.26)
Apr.	0.15	0.36	0.15	0.24	0.36	0.30	0.96	0.86
	(0.84)	(2.02)	(0.84)	(1.34)	(2.02)	(1.68)	(5.38)	(4.82)
May	0.14	0.41	0.15	0.15	0.43	0.23	0.94	
	(0.78)	(2.30)	(0.84)	(0.84)	(2.41)	(1.29)	(5.26)	
June	0.11	0.39	0.13	0.13	0.47	0.21	0.90	
	(0.62)	(2.18)	(0.73)	(0.73)	(2.63)	(1.18)	(5.04)	
July	0.1	0.52	0.14	0.13	0.64	0.27		
	(0.56)	(2.91)	(0.78)	(0.73)	(3.58)	(1.51)		
Aug.	0.09	0.84	0.13	0.12	0.55	0.25	0.40	5.30
	(0.50)	(4.70)	(0.73)	(0.56)	(3.08)	(1.40)	(2.24)	(29.68)
Sep.	0.08	0.75	0.23	0.12	0.38	0.24	0.83	5.16
	(0.45)	(4.20)	(1.29)	(0.56)	(2.13)	(1.34)	(4.65)	(28.90)

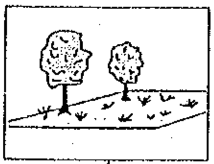
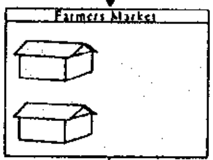
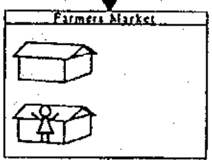
Remark: 1 Peso = US$ 1、 US$ 1 = Bs. 5.6
Source: SIIAP (Mercado Central de Buenos Aires)

表 2-38　ブラジルの青果物卸売価格

Commodity	Weight (kg)	Price (US$)	Equivalent Bs./kg
Potato	50	7.08	0.79
Tomato	24	7.24	1.69
Onion	20	11.33	3.17
Carrot	25	5.44	1.22
Banana	18	8.42	2.62
Citrus	25	7.02	1.57
Pineapple	100 unit	69.12	3.86/unit
Peach	14 pieces	2.32	0.93/piece

Source: CEAGESP, Private communication (December 2, 1998)

表 2-39 アバスト市場の施設整備および運営組織の歴史的変遷 - 1/2

Year	Law/ Regulation Construction/ Rehabilitation	Abasto Market	Management Organization: Committee	Management Organization: Management Body
1978	Municipal Gov. decided the construction site of Abasto Market			
1981	Acceding to S.D. 17921, MACA is authorized to acquire aloan from Bolivia's Central Bank for construction ofFarmers Market. Acceding to S.D. 18057, Municipal Gov. is in charge of implementation of construction of Farmers Market.			
1983	Inter-institutional agreement between MACA and Municipal Gov. on construction of Abasto Market was signed Two bldgs. were constructed by the fund of Argentina.			
1984	Accordingto S.D. 20015,20427, buildings were handed over to FSUTCSC. According to S.D. 20136, Department Committee is in charge of management of Farmers' market.		Department Committee	• Municipal Gov. • FSUTCSC
1985	According to Law, Municipal Gov. is in chargeofconstruction, administration and maintenance of Municipal Market.		Department Committee	• Municipal Gov. • FSUTCSC
1987	According to S.D., Department Committee is reorganized to CRAMA		CRAMA	• Municipal Gov. • FSUTCSC

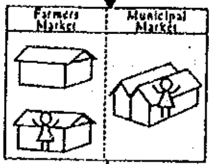
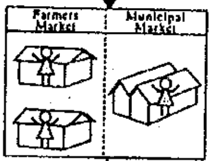
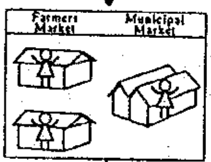
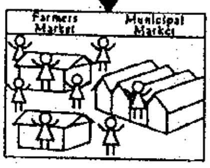
Legend


Building


Users Organization

Source : Field Survey of Phase I of Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz, Bolivia, 1998

表 2-39 アバスト市場の施設整備および運営組織の歴史的変遷 －2/2

Year	Law/ Regulation Construction/ Rehabilitation	Abasto Market	Management Organization	
			Committee	Management Body
1990	Cooperativa 2 de Junio constructed bldg. by USUFRUCT system. Basic infrastructurewas constructedby EmergencySocial Fund, CORDECRUZ and Municipal Gov.		CRAMA	• Municipal Gov. • FSUTCSC • Cooperativa 2 de Junio
1994			CRAMA no longer function	• Municipal Gov. • FSUTCSC • ASPROA • Cooperativa 2 de Junio
1995	According to Decentralization Law, Central Gov. conferredthe power to Prefectureto establish committee in place of CRAMA		Operation Management Committee (no legal status). This committee disappeared within this year.	• Municipal Gov. • FSUTCSC • ASPROA • Cooperativa 2 de Junio
1996	Municipal Gov. rehabilitated infrastructure		M/P Follow-up Committee (no legal status)	• Municipal Gov. • FSUTCSC • ASPROA • Cooperativa 2 de Junio
1997 1998	Cooperativa 2 de Junio expanded its building		Coordination and Follow-up Committee of M/P (no legal status)	• Municipal Gov. • ASPROA • 19 de Marzo • ASPROCA • ACMAPA • 24 de September AIPPA • ASPROCE • Cooperativa 2 de Junio

Legend


Building


Users Organization

Source : Field Survey of Phase I of Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz, Bolivia, 1998

表 2-40　1994 年から 1998 年までのアバスト市場の組織、インフラおよび施設の変化

Item	1994 (M/P Stage)		1998 (F/S Stage)	
	Farmers' Market	Municipal Market	Farmers' Market	Municipal Market
(1) Law/Regulation	According to S.D. of 1987, CRAMA is dictated as a management orgnaization	Accoding to law of 1985. Municipal Gov. is in charge of construction, administration and maintenance of municipal Market	After Decentralization Law of 1995. S.D. of 1987 CRAMA was made invalid. Prefectural Resolution is enough to establish organization such as CRAMA. In 1995, Municipal Ordinance of Santa Cruz authorized the expropriation of real estate for expansion of Abasto Market.	Municipal Gov. is in charge of construction, administration and maintenance.
(2) Management organization and management	CRAMA no longer functions. Abasto market was operated and managed by FSUTCSC, ASPROA and Municipal Gov.	Cooperativa 2 de Junio managed in cooperation with Municipal Gov.	FSUTCSC and ASPROA split into seven associations. The said 7 associations and Municipal Gov. manage and operate Ab asto Market. Coordination and Follow-up Committee of M/P was established in 1997.	Cooperativa 2 de Junio managed in cooperation with Municipal Gov.
(3) Facilities/Infrastructure and O/M				
1) Extent of area	16,000 m^2	16,000 m^2	28,000 m^2 Increased land area are utilised as parking area.	16,000 m^2
2) Cooperative Building	-	7,000 m^2	-	14,000 m^2 Cooprative bldg. was expanded in 1995.
3) Temporary sheds	4 sheds	-	12 sheds	-
4) Infrastructure				
a. Pavement	Some areas were not paved	-	All areas have been paved	-
b. Parking area	-	-	About 50 trucks parking area within market decreased due to occupation of passage by increased merchants.	-
c. Cover of drain trench outside market	Drain trench was not covered. Sanitary condition was bad.	Drain trench was not covered. Sanitary condition was bad.	Drain trench has been covered. Sanitary condition is good.	Drain trench was not covered. Sanitary condition is good.
d. Garbage area	Garbage area was located within the market.	-	Garbage areas have been located to three points outside the market.	-

Remark: S.D.; Supreme Decree

Source: Field survey of Phase I of Feasibility Study for the Improvement of Agricultural Marketing system in Santa Cruz, Bolivia, 1998

表 2-41　アバスト市場の既存運営体制の法的拠所と運営実施状況

Item		Draft Law/Regulation	Operation/Maintenance 1994	1998
Organization				
• Committee		O	O	X
Management				
• Kinds of commodities		O	X	X
• Qualification and registration of users		O	X	X
• Transaction system	*Aucion*	O	X	X
	Direct negotiation/ Consignment	O	O	O
	Prohibition of transaction among wholeselers	O	X	X
	Cash Payment	O	X	X
• Fee system	*Municipal GOV.*	O	O	X
	Users organization	X	O	O
• Operation days and hours		O	Δ	Δ
• Utilization of facilities		O	X	X
• Collection/Publication of marketing information	*Collection : Price*	O	Δ	Δ
	: Volume	O	Δ	Δ
	Publication : Price	O	X	X
	: Volume	O	X	X
• Monitoring of utilization of selling section		O	X	X
• Standard of product		O	X	X
• Prohibition/Penalties		O	X	X
Operation				
• Security control		O	O	O
• Price/weight control		O	Δ	Δ
• Control of entering, circulating and parking of vehicles		O	Δ	Δ
• Mediation of conflic		O	Δ	Δ
• Sanitary control		O	O	O
• Gabage collection		O	O	O

Remark: (1) Law/Regulation　o : Exist　x: Not Exist
(2) Operation/Maintenance　o : Implemented　Δ : Partially implemend　x : Not implemented

Source: (1) Law/Regulation - Law/Regulation on Wholesale Market in Japan, Brazil and Germany.
- Draft reguration prepared by CRAMA in 1987.
- Draft regulation prepared by Coordination Committee in 1998

(2) Field Survey of Phase I of Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz, Bolivia, 1998

表 2-42 渓谷地において利用可能な農業クレジット

Province	Organizations
Florida	ASOHFRUT, PRECONAT, Saving & Credit Cooperatives, PDA (NGO)
Caballero	ASOHFRUT, 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

表 2-43 渓谷地における農業クレジットの貸付け条件

Organization	Target Groups for Credit	Terms & Conditions
ASOHFRUT	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

表 2-44 産地集出荷場に利用可能な資金調達先一覧

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
ASOHFRUT	Land / house title & group guarantor	12	1,000/Ha	-	Production, planting and plant/seed production

表 3-1 産地集出荷場の開発準備状況評価 －1/2

Assessment Criteria	Target Collection Area		
	Florida Province		
	Samaipata Collection Area	Mairana Collection Area	Pampa Grande Collection Area
1. Existence of Facility for Use as C/D	ASOHFRUT collection facility	Not Available	Not Available
2. Production Volumes of Target Commodities at Full Operation Stage(t)	11,100	10,100	19,900
3. Currently Prevailing Marketing System	Farmers direct marketing to ABASTO	Farmers direct marketing to ABASTO	Farmers direct marketing to ABASTO
4. Results of Discussion Meeting	Concensus obtained among participants at the meeting held on Nov. 20	Concensus obtained among participants at the meeting held on Nov. 19	No concensus obtained among participants at the meeting held on Nov. 20
5. Coverage of Existing Farmers Organziation	ASOHFRUT : registered member 170 AGROPLAN: about 90 members	ASOHFRUT : registered member 111	ASOHFRUT : registered member 234
6. Activities of Supporting organization & Intention of Local Government Identified through 3 Discussion Meeting Held at Municipal	Municipal government has strong intention to promote fruit production and to establish C/D	Municipal government has strong intention to establish C/D	Municipal government support C/D
7. Existence of Movement for Cooperative Marketing	AGROPLAN(about 90 memebrs) directly shipping commodities produced under organic farming to St. Cruz(supermarket etc.)	-	Influence of Famers Market Project appears to be substantial(negative to C/D) Social conflict between Pampa Grande and Los Negros comunity(negative factor)
8. Construction Costs per Ton of Products Collected at Full Operation Stage(US$/t)	9.5 (San Isidro: US$ 8.0/t)	68.3	51.2
Overall Assessment	1st Phase Development	2nd Phase Development	2nd Phase Development

表 3-1 産地集出荷場の開発準備状況評価 －2/2

Assessment Criteria	Taget Collection Area Caballero Province Comarapa Collection Area	 Caballero Province Saipina Collection Area	 Vallegrande Province Vallegrande Collection Area
1. Existence of Available Facility	No	No	No
2. Production Volumes of Target Commodities at Full Operation Stage(t)	12,600	21,700	21,900
3. Currently Prevailing Marketing System	Farmers direct marketing to ABASTO & Cochabamba	Consignment marketing to Cochabamba (highly positive factor to use of C/D)	Seeling to intermediary at site (destination: ABASTO)
4. Results of Discussion Meeting	Concensus obtained among participants at the meeting held on Nov. 27	Concensus obtained among participants at the meeting held on Nov. 27	Concensus obtained among participants at the meeting held on Nov. 27
5. Coverage of Existing Farmers Organziation	All producres in target collection areas (irigated areas) organized into water users associations, hoewever, conflict between Lapisa area(newly irrigated area) & others areas for water distribution	All producres in target collection areas (irigated areas) organized into water users associations	ASOHFRUT : registered member 61 CAPA(all vallegrande prov.): 700
6. Activities of Supporting organization & Intention of Local Government	Municipal government support C/D	Municipal government support C/D	Municipal government has strong intention to promote fruit production and to establish C/D ICO will provide technical support
7. Existence of Movement for Cooperative Marketing & Others	EMCA prsesident was reluctant to take management role of C/D in Saipina, while manager accepted the role. Need to have concensus among members.	All the representatives of water users associations supported C/D center	Establishment of FDF(Fundacion para el Desarrollo Fruticola de la Provincia) planned by initiative of ICO CAPA has intention & plan
8. Construction Costs per Ton of Products Collected at Full Operation Stage	57.0 (San Isidro: US$ 8.5/t)	36.9	32.7
Overall Assessment	2nd Phase Development	1st Phase Development	1st Phase Development

表 3-2　計画段階の灌漑プロジェクトが実施された場合の予測作付面積および生産量
（コマラパ、サイピナ：2005年）

Crops	Comarapa Area Cropped Area (ha)	Comarapa Area Production (t)	Saipina Area Cropped Area (t/ha)	Saipina Area Production (t)
1. Root Crop				
Potatoes	440	4,840	940	10,340
2. Vegetables				
Tomato	150	2,550	580	9,860
Green Pepper	100	1,200		
Others	250	1,250	470	2,350
Sub-total	500	5,000	1,050	12,210
3. Fruits	40	400	0	0
4. Others				
Sugarcane				
Others				
Sub-total	0	0	0	0
Total	980	10,240	1,990	22,550

Remarks 1: Assumed as follows;
- All potaoes & vegetables cultivated under irrigation
- Cropping pattern under irrigation: potato 45 %, tomato 15%, green pepper 10%, fruit 5 %, others 25 %
- Cropping intensity in irrigated area: about 130 % of irrigated areas(750ha)

Remarks 2: Target Commodities: Commodities for collection under the present study

Remarks 3:
"Others" in 2. Vegetables represented by pea/bean.

Remarks 4: "Others" in 3. Fruits represented by peach

Remarks 5: Assumed as follows;
- All potaoes & vegetables cultivated under irrigation
- Cropping pattern under irrigation: potato 40 %, tomato 25%, sugarcane 15%,others vegetables 20 %
- Cropping intensity in irrigated area: about 140 % of irrigated areas(1,675ha)

Remarks 6: Target Commodities: Commodities for collection under the present study

Remarks 7:
"Others" in 2. Vegetablesrepresented by pea/bean.

Source: Data presented by PRICRUZ

表 3-3　計画段階の灌漑プロジェクトが実施された場合の予測作付面積および生産量
（コマラパ、バジェグランデ：2010年）

Crops	Comarapa Area Cropped Area (ha)	Comarapa Area Production (t)	Vallegande Area Cropped Area (t/ha)	Vallegande Area Production (t)
1. Root Crop				
Potatoes	450	5,400	950	11,400
2. Vegetables				
Tomato	160	3,040	150	2,550
Green Pepper	100	1,300		
Others	250	1,500	200	2,200
Sub-total	510	5,840	350	4,750
3. Fruits				
Peach			180	1,980
Plum			80	880
Others	50	550	260	2,860
Sub-total	50	550	520	5,720
4. Others				
Sugarcane				
Others				
Sub-total	0	0		0
Total	1,010	11,790	1,820	21,870

Remarks 1: Assumed as follows;
- All potaoes & vegetables cultivated under irrigation
- Cropping pattern under irrigation: potato 45 %, tomato 15%, green pepper 10%, fruit 5 %, others 25 %
- Cropping intensity in irrigated area: about 130 % of irrigated areas(780ha)

Remarks 2: Target Commodities: Commodities for collection under the present study

Remarks 3:
"Others" in 2. Vegetables represented by pea/bean.

Remarks 4: "Others" in 3. Fruits represented by peach

Remarks 5: Assumed as follows;
- All vegetables cultivated under irrigation
- Cropped areas of fruits: peach 35%, plum 15%, apple 20% others 30 %
- Cropping pattern under irrigation: potato 35 %, tomato 10%, sugarcane 13%, others vegetables 14 %, fruits 28 %
- Cropping intensity in irrigated area: about 115 % of irrigated areas(1,250ha)
- Under rainfed: potato 450ha & fruit 120 ha

Remarks 6: Target Commodities: Commodities for collection under the present study

Remarks 7: "Others" in 2.Vegetables represented by pea/bean

Source: Data presented by PRICRUZ

表 3-4　渓谷地における推定ならびに予測青果物生産量・流通量

Commodity	Items	Province: Florida	Province: Caballero	Province: Vallegrande	Valley Region Total
Base Year(1998, estimation) & 2000(projection)					
1. Root Crop(Potato)	Production(000 t)	15.0	16.7	22.0	53.7
	Commercialization Rate(%)	85	90	80	85
	Marketing Volume(000 t)	12.8	15.0	17.6	45.4
2. Vegetables	Production(000 t)	20.9	21.8	7.3	50.0
	Commercialization Rate(%)	85	85	85	85
	Marketing Volume(000 t)	17.8	18.5	6.2	42.5
3. Fruits	Production(000 t)	6.7	0.4	6.0	13.1
	Commercialization Rate(%)	85	85	85	85
	Marketing Volume(000 t)	5.7	0.3	5.1	11.1
Total	Production(000 t)	42.6	38.9	35.3	116.8
	Commercialization Rate(%)	85	87	82	85
	Marketing Volume(000 t)	36.2	33.9	28.9	99.0
Year 2005(projection)					
1. Root Crop(Potato)	Production(000 t)	15.0	21.1	22.0	58.1
	Commercialization Rate(%)	86	87	85	86
	Marketing Volume(000 t)	12.9	18.4	18.7	50.0
2. Vegetables	Production(000 t)	20.9	27.2	7.3	55.4
	Commercialization Rate(%)	86	88	87	87
	Marketing Volume(000 t)	18.0	23.9	6.4	48.3
3. Fruits	Production(000 t)	6.7	0.4	6.0	13.1
	Commercialization Rate(%)	87	85	85	86
	Marketing Volume(000 t)	5.8	0.3	5.1	11.3
Total	Production(000 t)	42.6	48.7	35.3	126.6
	Commercialization Rate(%)	86	88	85	86
	Marketing Volume(000 t)	36.7	42.6	30.2	109.5
Year 2010(projection)					
1. Root Crop(Potato)	Production(000 t)	16.5	23.3	24.1	63.9
	Commercialization Rate(%)	87	89	85	87
	Marketing Volume(000 t)	14.4	20.7	20.5	55.6
2. Vegetables	Production(000 t)	23.0	30.2	10.3	63.5
	Commercialization Rate(%)	90	90	90	90
	Marketing Volume(000 t)	20.7	27.2	9.3	57.2
3. Fruits	Production(000 t)	8.2	0.6	8.4	17.2
	Commercialization Rate(%)	90	90	90	90
	Marketing Volume(000 t)	7.4	0.5	7.6	15.5
Total	Production(000 t)	47.7	54.1	42.8	144.6
	Commercialization Rate(%)	89	90	87	89
	Marketing Volume(000 t)	42.4	48.5	37.3	128.2

Source: Results of study by JICA Study Team, 1998

表 3-5　目標商品化率および集荷割合

Collection Area/Commodity	1st Year of Operation Rates(%)			2nd Year of Operation Rates(%)			3rd Year of Operation Rates(%)			4th Year of Operation Rates(%)			5th Year of Operation & after Rates(%)		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
1. San Isidro Collection Area															
Potatoes	90	30	27	90	40	36	90	50	45	90	60	54	90	70	63
Vegetables	85	30	26	85	40	34	85	50	43	85	60	51	90	70	63
Fruits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Samaipata Collection Area															
Potatoes	80	20	16	80	30	24	80	40	32	80	50	40	85	60	51
Vegetables	85	20	17	85	30	26	85	40	34	85	50	43	90	60	54
Fruits	85	20	17	85	30	26	85	50	43	85	70	60	90	80	72
3. Vallegrande Collection Area															
Potatoes	80	20	16	80	30	24	80	40	32	80	50	40	85	60	51
Vegetables	85	30	26	85	40	34	85	50	43	85	60	51	90	70	63
Fruits	85	30	26	85	40	34	85	50	43	85	60	51	90	70	63
4. Saipina Collection Area															
Potatoes	90	30	27	90	40	36	90	50	45	90	60	54	90	70	63
Vegetables	85	30	26	85	40	34	85	50	43	85	60	51	90	70	63
Fruits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Mairana Collection Area															
Potatoes	80	30	24	80	40	32	80	60	48	80	70	56	85	80	68
Vegetables	85	30	26	85	40	34	85	60	51	85	70	60	90	80	72
Fruits	85	30	26	85	40	34	85	60	51	85	70	60	90	80	72
6. Pampa Grande Collection Area															
Potatoes	90	20	18	90	30	27	90	50	45	90	60	54	90	70	63
Vegetables	85	20	17	85	30	26	85	50	43	85	60	51	90	70	63
Fruits	85	20	17	85	30	26	85	50	43	85	60	51	90	70	63
7. Comarapa Collection Area															
Potatoes	80	30	24	80	40	32	80	50	40	80	60	48	85	70	60
Vegetables	85	30	26	85	40	34	85	50	43	85	60	51	90	70	63
Fruits	85	30	26	85	40	34	85	50	43	85	60	51	90	70	63

Remarks: Rates(%) 1 -- commerciarization rate, 2 -- rate of collection, 3 -- target collection rate(1 x 2)

表 3-6 産地集出荷場開設初年度から完全稼動時までの目標集出荷量 －1/4

Year	Factors	San Isidro Collection Area: Development Stage	Potato	Vegetables	Total	Samaipata Collection Area: Development Stage	Potato	Vegetables	Fruits	Total
2001	1. Production(t)	1st Year	6,000	9,900	15,900					
	2. Commercialization Rate(%)		90	85	-					
	3. Rate of Collection(%)		30	30	-					
	4. Target Collection Rate(%; 2 x 3)		27	26	26					
	5. Target Collection Volume(t: 1 x 4 /100)		1,620	2,520	4,140					
2002	1. Production(t)	2nd Year	6,000	9,900	15,900					
	2. Commercialization Rate(%)		90	85	-					
	3. Rate of Collection(%)		40	40	-					
	4. Target Collection Rate(%; 2 x 3)		36	34	35					
	5. Target Collection Volume(t: 1 x 4 /100)		2,160	3,370	5,530					
2003	1. Production(t)	3rd Year	6,000	9,900	15,900	1st Year	5,200	2,250	1,900	9,350
	2. Commercialization Rate(%)		90	85	-		80	85	85	-
	3. Rate of Collection(%)		50	50	-		20	20	20	-
	4. Target Collection Rate(%; 2 x 3)		45	43	43		16	17	17	16
	5. Target Collection Volume(t: 1 x 4 /100)		2,700	4,210	6,910		830	380	320	1,530
2004	1. Production(t)	4th Year	6,000	9,900	15,900	2nd Year	5,200	2,250	1,900	9,350
	2. Commercialization Rate(%)		90	85	-		80	85	85	-
	3. Rate of Collection(%)		60	60	-		30	30	30	-
	4. Target Collection Rate(%; 2 x 3)		54	51	52		24	26	26	25
	5. Target Collection Volume(t: 1 x 4 /100)		3,240	5,050	8,290		1,250	570	490	2,310
2005	1. Production(t)	5th Year	6,000	9,900	15,900	3rd Year	5,200	2,250	1,900	9,350
	2. Commercialization Rate(%)		90	90	-		80	85	85	-
	3. Rate of Collection(%)		70	70	-		40	40	50	-
	4. Target Collection Rate(%; 2 x 3)		63	63	63		32	34	43	35
	5. Target Collection Volume(t: 1 x 4 /100)		3,780	6,240	10,020		1,660	770	810	3,240
2006	1. Production(t)	Full Operation 6th Year	6,600	10,900	17,500	4th Year	5,200	2,250	1,900	9,350
	2. Commercialization Rate(%)		90	90	-		80	85	85	-
	3. Rate of Collection(%)		70	70	-		50	50	70	-
	4. Target Collection Rate(%; 2 x 3)		63	63	63		40	43	60	45
	5. Target Collection Volume(t: 1 x 4 /100)		4,160	6,870	11,030		2,080	960	1,130	4,170
2007	1. Production(t)	Full Operation 7th Year	6,600	10,900	17,500	5th Year	5,200	2,250	1,900	9,350
	2. Commercialization Rate(%)		90	90	-		85	90	90	-
	3. Rate of Collection(%)		70	70	-		60	60	80	-
	4. Target Collection Rate(%; 2 x 3)		63	63	63		51	54	72	56
	5. Target Collection Volume(t: 1 x 4 /100)		4,160	6,870	11,030		2,650	1,220	1,370	5,240
2008	1. Production(t)	Full Operation 8th Year	6,600	10,900	17,500	6th Year	5,700	2,500	2,500	10,700
	2. Commercialization Rate(%)		90	90	-		85	90	90	-
	3. Rate of Collection(%)		70	70	-		60	60	80	-
	4. Target Collection Rate(%; 2 x 3)		63	63	63		51	54	72	57
	5. Target Collection Volume(t: 1 x 4 /100)		4,160	6,870	11,030		2,910	1,350	1,800	6,060
2009	1. Production(t)	Full Operation 9th Year	6,600	10,900	17,500	7th Year	5,700	2,500	2,700	10,900
	2. Commercialization Rate(%)		90	90	-		85	90	90	-
	3. Rate of Collection(%)		70	70	-		60	60	80	-
	4. Target Collection Rate(%; 2 x 3)		63	63	63		51	54	72	57
	5. Target Collection Volume(t: 1 x 4 /100)		4,160	6,870	11,030		2,910	1,350	1,940	6,200
2010	1. Production(t)	Full Operation 10th Year	6,600	10,900	17,500	Full Operation 8th Year	5,700	2,500	2,900	11,100
	2. Commercialization Rate(%)		90	90	-		85	90	90	-
	3. Rate of Collection(%)		70	70	-		60	60	80	-
	4. Target Collection Rate(%; 2 x 3)		63	63	63		51	54	72	57
	5. Target Collection Volume(t: 1 x 4 /100)		4,160	6,870	11,030		2,910	1,350	2,090	6,350

表 3-6 産地集出荷場開設初年度から完全稼動時までの目標集出荷量 - 2/4

Year	Factors	Vallegrande Collection Area: Development Stage	Potato	Vegetables	Fruits	Total	Saipina Collection Area: Development Stage	Potato	Vegetables	Total
2001	1. Production(t)									
	2. Commercialization Rate(%)									
	3. Rate of Collection(%)									
	4. Target Collection Rate(%; 2 x 3)									
	5. Target Collection Volume(t: 1 x 4 /100)									
2002	1. Production(t)									
	2. Commercialization Rate(%)									
	3. Rate of Collection(%)									
	4. Target Collection Rate(%; 2 x 3)									
	5. Target Collection Volume(t: 1 x 4 /100)									
2003	1. Production(t)	1st Year	9,900	2,000	3,500	15,400	1st Year	7,900	9,600	17,500
	2. Commercialization Rate(%)		80	85	85	-		90	85	-
	3. Rate of Collection(%)		20	30	30	-		30	30	-
	4. Target Collection Rate(%; 2 x 3)		16	26	26	19		27	26	26
	5. Target Collection Volume(t: 1 x 4 /100)		1,590	510	890	2,990		2,130	2,440	4,570
2004	1. Production(t)	2nd Year	9,900	2,000	3,500	15,400	2nd Year	8,600	10,100	18,700
	2. Commercialization Rate(%)		80	85	85	-		90	85	-
	3. Rate of Collection(%)		30	40	40	-		40	40	-
	4. Target Collection Rate(%; 2 x 3)		24	34	34	28		36	34	35
	5. Target Collection Volume(t: 1 x 4 /100)		2,380	680	1,190	4,250		3,100	3,430	6,530
2005	1. Production(t)	3rd Year	9,900	2,000	3,500	15,400	3rd Year	9,400	11,200	20,600
	2. Commercialization Rate(%)		80	85	85	-		90	85	-
	3. Rate of Collection(%)		40	50	50	-		50	50	-
	4. Target Collection Rate(%; 2 x 3)		32	43	43	36		45	43	44
	5. Target Collection Volume(t: 1 x 4 /100)		3,170	850	1,490	5,510		4,230	4,760	8,990
2006	1. Production(t)	4th Year	9,900	2,000	3,500	15,400	4th Year	9,400	11,200	20,600
	2. Commercialization Rate(%)		80	85	85	-		90	85	-
	3. Rate of Collection(%)		50	60	60	-		60	60	-
	4. Target Collection Rate(%; 2 x 3)		40	51	51	44		54	51	52
	5. Target Collection Volume(t: 1 x 4 /100)		3,960	1,020	1,790	6,770		5,080	5,710	10,790
2007	1. Production(t)	5th Year	9,900	2,000	3,500	15,400	5th Year	9,400	11,200	20,600
	2. Commercialization Rate(%)		85	90	90	-		90	90	-
	3. Rate of Collection(%)		60	70	70	-		70	70	-
	4. Target Collection Rate(%; 2 x 3)		51	63	63	55		63	63	63
	5. Target Collection Volume(t: 1 x 4 /100)		5,050	1,260	2,200	8,510		5,920	7,060	12,980
2008	1. Production(t)	6th Year	11,100	3,500	4,800	19,400	Full Operation 6th Year	10,300	12,400	22,700
	2. Commercialization Rate(%)		85	90	90	-		90	90	-
	3. Rate of Collection(%)		60	70	70	-		70	70	-
	4. Target Collection Rate(%; 2 x 3)		51	63	63	56		63	63	63
	5. Target Collection Volume(t: 1 x 4 /100)		5,660	2,210	3,020	10,890		6,490	7,810	14,300
2009	1. Production(t)	7th Year	11,300	4,300	5,300	20,900	Full Operation 7th Year	10,300	12,400	22,700
	2. Commercialization Rate(%)		85	90	90	-		90	90	-
	3. Rate of Collection(%)		60	70	70	-		70	70	-
	4. Target Collection Rate(%; 2 x 3)		51	63	63	57		63	63	63
	5. Target Collection Volume(t: 1 x 4 /100)		5,760	2,710	3,340	11,810		6,490	7,810	14,300
2010	1. Production(t)	Full Operation 8th Year	11,400	4,700	5,800	21,900	Full Operation 8th Year	10,300	12,400	22,700
	2. Commercialization Rate(%)		85	90	90	-		90	90	-
	3. Rate of Collection(%)		60	70	70	-		70	70	-
	4. Target Collection Rate(%; 2 x 3)		51	63	63	57		63	63	63
	5. Target Collection Volume(t: 1 x 4 /100)		5,810	2,960	3,650	12,420		6,490	7,810	14,300

表 3-6 産地集出荷場開設初年度から完全稼動時までの目標集出荷量 －3/4

Year	Factors	Mairana Collection Area: Development Stage	Potato	Vegetables	Fruits	Total	Pampa Grande Collection Area: Development Stage	Potato	Vegetables	Fruits	Total
2001	1. Production(t)										
	2. Commercialization Rate(%)										
	3. Rate of Collection(%)										
	4. Target Collection Rate(%; 2 x 3)										
	5. Target Collection Volume(t: 1 x 4 /100)										
2002	1. Production(t)										
	2. Commercialization Rate(%)										
	3. Rate of Collection(%)										
	4. Target Collection Rate(%; 2 x 3)										
	5. Target Collection Volume(t: 1 x 4 /100)										
2003	1. Production(t)										
	2. Commercialization Rate(%)										
	3. Rate of Collection(%)										
	4. Target Collection Rate(%; 2 x 3)										
	5. Target Collection Volume(t: 1 x 4 /100)										
2004	1. Production(t)	1st Year	1,700	4,900	2,500	9,100	1st Year	4,500	11,700	1,300	17,500
	2. Commercialization Rate(%)		80	85	85	-		90	85	85	-
	3. Rate of Collection(%)		30	30	30	-		20	20	20	-
	4. Target Collection Rate(%; 2 x 3)		24	26	26	25		18	17	17	17
	5. Target Collection Volume(t: 1 x 4 /100)		410	1,250	640	2,300		810	1,990	220	3,020
2005	1. Production(t)	2nd Year	1,700	4,900	2,500	9,100	2nd Year	4,500	11,700	1,300	17,500
	2. Commercialization Rate(%)		80	85	85	-		90	85	85	-
	3. Rate of Collection(%)		40	40	40	-		30	30	30	-
	4. Target Collection Rate(%; 2 x 3)		32	34	34	34		27	26	26	26
	5. Target Collection Volume(t: 1 x 4 /100)		540	1,670	850	3,060		1,220	2,990	330	4,540
2006	1. Production(t)	3rd Year	1,700	4,900	2,500	9,100	3rd Year	4,500	11,900	1,300	17,700
	2. Commercialization Rate(%)		80	85	85	-		90	85	85	-
	3. Rate of Collection(%)		60	60	60	-		50	50	50	-
	4. Target Collection Rate(%; 2 x 3)		48	51	51	51		45	43	43	43
	5. Target Collection Volume(t: 1 x 4 /100)		820	2,500	1,280	4,600		2,030	5,060	550	7,640
2007	1. Production(t)	4th Year	1,700	4,900	2,500	9,100	4th Year	4,500	11,900	1,300	17,700
	2. Commercialization Rate(%)		80	85	85	-		90	85	85	-
	3. Rate of Collection(%)		70	70	70	-		60	60	60	-
	4. Target Collection Rate(%; 2 x 3)		56	60	60	59		54	51	51	52
	5. Target Collection Volume(t: 1 x 4 /100)		950	2,920	1,490	5,360		2,430	6,070	660	9,160
2008	1. Production(t)	5th Year	1,700	4,900	2,500	9,100	5th Year	4,500	11,900	1,300	17,700
	2. Commercialization Rate(%)		85	90	90	-		90	90	90	-
	3. Rate of Collection(%)		80	80	80	-		70	70	70	-
	4. Target Collection Rate(%; 2 x 3)		68	72	72	71		63	63	63	63
	5. Target Collection Volume(t: 1 x 4 /100)		1,160	3,530	1,800	6,490		2,840	7,500	820	11,160
2009	1. Production(t)	Full Operation 6th Year	1,900	5,400	2,800	10,100	Full Operation 6th Year	5,100	13,300	1,500	19,900
	2. Commercialization Rate(%)		85	90	90	-		90	90	90	-
	3. Rate of Collection(%)		80	80	80	-		70	70	70	-
	4. Target Collection Rate(%; 2 x 3)		68	72	72	71		63	63	63	63
	5. Target Collection Volume(t: 1 x 4 /100)		1,290	3,890	2,020	7,200		3,210	8,380	950	12,540
2010	1. Production(t)	Full Operation 7th Year	1,900	5,400	2,800	10,100	Full Operation 7th Year	5,100	13,300	1,500	19,900
	2. Commercialization Rate(%)		85	90	90	-		90	90	90	-
	3. Rate of Collection(%)		80	80	80	-		70	70	70	-
	4. Target Collection Rate(%; 2 x 3)		68	72	72	71		63	63	63	63
	5. Target Collection Volume(t: 1 x 4 /100)		1,290	3,890	2,020	7,200		3,210	8,380	950	12,540

表 3-6 産地集出荷場開設初年度から完全稼動時までの目標集出荷量 －4/4

Year	Factors	Development Stage	Comarapa Collection Area: Potato	Vegetables	Fruits	Total	Overall: Year	Potato	Vegetables	Fruits	Total
2001	1. Production(t)						2001	6,000	9,900	0	15,900
	2. Commercialization Rate(%)							-	-	-	-
	3. Rate of Collection(%)							-	-	-	-
	4. Target Collection Rate(%: 2 x 3)							-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)							1,620	2,520	0	4,140
2002	1. Production(t)						2002	6,000	9,900	0	15,900
	2. Commercialization Rate(%)							-	-	-	-
	3. Rate of Collection(%)							-	-	-	-
	4. Target Collection Rate(%: 2 x 3)							-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)							2,160	3,370	0	5,530
2003	1. Production(t)						2003	29,000	23,750	5,400	58,150
	2. Commercialization Rate(%)							-	-	-	-
	3. Rate of Collection(%)							-	-	-	-
	4. Target Collection Rate(%: 2 x 3)							-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)							7,250	7,540	1,210	16,000
2004	1. Production(t)	1st Year	4,900	5,200	400	10,500	2004	40,800	46,050	9,600	96,450
	2. Commercialization Rate(%)		80	85	85	-		-	-	-	-
	3. Rate of Collection(%)		30	30	30	-		-	-	-	-
	4. Target Collection Rate(%: 2 x 3)		24	26	26	25		-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)		1,180	1,330	100	2,610		12,370	14,300	2,640	29,310
2005	1. Production(t)	2nd Year	4,900	5,200	400	10,500	2005	41,600	47,150	9,600	98,350
	2. Commercialization Rate(%)		80	85	85	-		-	-	-	-
	3. Rate of Collection(%)		40	40	40	-		-	-	-	-
	4. Target Collection Rate(%: 2 x 3)		32	34	34	33		-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)		1,570	1,770	140	3,480		16,170	19,050	3,620	38,840
2006	1. Production(t)	3rd Year	4,900	5,200	400	10,500	2006	42,200	48,350	9,600	100,150
	2. Commercialization Rate(%)		80	85	85	-		-	-	-	-
	3. Rate of Collection(%)		50	50	50	-		-	-	-	-
	4. Target Collection Rate(%: 2 x 3)		40	43	43	41		-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)		1,960	2,210	170	4,340		20,090	24,330	4,920	49,340
2007	1. Production(t)	4th Year	4,900	5,200	400	10,500	2007	42,200	48,350	9,600	100,150
	2. Commercialization Rate(%)		80	85	85	-		-	-	-	-
	3. Rate of Collection(%)		60	60	60	-		-	-	-	-
	4. Target Collection Rate(%: 2 x 3)		48	51	51	50		-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)		2,350	2,650	200	5,200		23,510	28,050	5,920	57,480
2008	1. Production(t)	5th Year	4,900	5,200	400	10,500	2008	44,800	51,300	11,500	107,600
	2. Commercialization Rate(%)		85	90	90	-		-	-	-	-
	3. Rate of Collection(%)		70	70	70	-		-	-	-	-
	4. Target Collection Rate(%: 2 x 3)		60	63	63	61		-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)		2,920	3,280	250	6,450		26,140	32,550	7,690	66,380
2009	1. Production(t)	Full Operation 6th Year	5,300	5,700	600	11,600	2009	46,200	54,500	12,900	113,600
	2. Commercialization Rate(%)		85	90	90	-		-	-	-	-
	3. Rate of Collection(%)		70	70	70	-		-	-	-	-
	4. Target Collection Rate(%: 2 x 3)		60	63	63	61		-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)		3,140	3,590	380	7,110		26,960	34,600	8,630	70,190
2010	1. Production(t)	Full Operation 7th Year	5,300	5,700	600	11,600	Overall Full Operation 2010	46,300	54,900	13,600	114,800
	2. Commercialization Rate(%)		85	90	90	-		-	-	-	-
	3. Rate of Collection(%)		70	70	70	-		-	-	-	-
	4. Target Collection Rate(%: 2 x 3)		60	63	63	61		-	-	-	-
	5. Target Collection Volume(t: 1 x 4 /100)		3,140	3,590	380	7,110		27,010	34,850	9,090	70,950

表 3-7　産地集出荷場計画対象地の特性評価結果

	Ranking of each target area for the criteria						
	Samaipata	Mairana	Pampa Grande	San Isidro	Comarapa	Saipina	V. Grande
1 Production $ Supply Potential (production/target collection volume, position of target area in agriculture development's framework, potential for production expansion)	7	6	2	2	2	1	2
3 Possibility for Adaptation of Proposed Transshipping Method (presence of transshipment, employment ratio of local transporters, presence of transporters cooperative)	2	5	5	5	1	2	2
4 Beneficiaries (owner farmers ratio, no. of beneficiaries, illiteracy ratio)	4	7	4	1	4	1	1
7 Project Evaluation (economic/financial reliabilities, income redistribution)	[illegible]	7	[illegible]	1	3	1	4
2 Possibility for Organizing Farmers (farmers intention to participate in cooperative collection/distribution, presence of current farmers cooperative activities, presence of current water management association)	2	2	2	2	2	2	1
8 Effective Technology Transfer to the related persons	[illegible]	1	2	2	2	5	5
6 Environmental Impact Assessment (social impact to the related persons, environmental impact)	1	1	1	1	1	1	1
5 Site Condition (accessibility to C/D Center from farms, existing facilities available for C/D Center, reliability of land acquisition, necessity of large scale land preparation, infrastructure condition)	1	[illegible]	[illegible]	2	4	[illegible]	3

1st Group :
* high potential for production/supply volume / * high possibility for adaptation of transshipping method / * high (comparative high) beneficiaries

3rd Group
* low potential for production/supply volume
* high possibility for adaptation of transshipping method
* low beneficiaries

4th Group
* low potential for production/supply volume
* low possibility for adaptation of transshipping method
* low beneficiaries

2nd Group
* high potential for production/supply volume
* low possibility for adaptation of transshipping method
* high-medium beneficiaries

Remark :
The numbers showed in this table indicate each target area's ranking considering 7 target areas for each Criteria. Therefore the lesser the number becomes, the more positive evaluation the target area gets in the Criteria.

表 3-7　産地集出荷場計画対象地の特性評価結果

	Ranking of each target area for the criteria						
	Samaipata	Mairana	Pampa Grande	San Isidro	Comarapa	Saipina	V. Grande
1 Production $ Supply Potential (production/target collection volume, position of target area in agriculture development's framework, potential for production expansion)	7	6	2	2	2	1	2
3 Possibility for Adaptation of Proposed Transshipping Method (presence of transshipment, employment ratio of local transporters, presence of transporters cooperative)	2	5	5	5	1	2	2
4 Beneficiaries (owner farmers ratio, no. of beneficiaries, illiteracy ratio)	4	7	4	1	4	1	1
7 Project Evaluation (economic/financial reliabilities, income redistribution)	5	7	5	1	3	1	4
2 Possibility for Organizing Farmers (farmers intention to participate in cooperative collection/distribution, presence of current farmers cooperative activities, presence of current water management association)	2	2	2	2	2	2	1
8 Effective Technology Transfer to the related persons	5	1	2	2	2	5	5
6 Environmental Impact Assessment (social impact to the related persons, environmental impact)	1	1	1	1	1	1	1
5 Site Condition (accessibility to C/D Center from farms, existing facilities available for C/D Center, reliability of land acquisition, necessity of large scale land preparation, infrastructure condition)	1	5	7	2	4	5	3

1st Group :
* high potential for production/supply volume / * high possibility for adaptation of transshipping method / * high (comparative high) beneficiaries

3rd Group
* low potential for production/supply volume
* high possibility for adaptation of transshipping method
* low beneficiaries

4th Group
* low potential for production/supply volume
* low possibility for adaptation of transshipping method
* low beneficiaries

2nd Group
* high potential for production/supply volume
* low possibility for adaptation of transshipping method
* high-medium beneficiaries

Remark :
The numbers showed in this table indicate each target area's ranking considering 7 target areas for each Criteria. Therefore the lesser the number becomes, the more positive evaluation the target area gets in the Criteria.

表 3-8　サンタクルスの人口増加の推定

	1997	*2000*	*2005*	*2010*
Dept. Santa Cruz	1,651951	1,813,029	2,052,492	2,396,778
Prov. A. Ibanez	1,009,379	1,145,268	1,393,396	1,654,917
City Santa Cruz	912,781	1,035,665	1,211,582	1,438,979

表 3-9　サンタクルス県の青果物需要と供給予測（2000年）

(Unit: 1,000 tons)

	Supply			*Demand*			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D balance
Valley	117	0	117	21	17	38	+79
Low land	362	0	362	210	80	290	+72
Import	-	13	13	-	-	-	+13
SC City	-	161	161	325	-	325	-164
Total	479	174	653	556	97	653	0

表 3-10　サンタクルス県の青果物需要と供給予測（2005年）

(Unit: 1,000 tons)

	Supply			*Demand*			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	127	0	127	21	22	43	+84
Low land	380	0	380	203	77	280	+100
Import	0	15	15	-	-	-	+15
SC City	0	181	181	380	-	380	-199
Total	507	196	703	604	99	703	0

表 3-11　サンタクルス県の青果物需要と供給予測（2010年）

(Unit: 1,000 tons)

	Supply			*Demand*			
	Production	Inflow	Total	Consumption	Outflow	Total	S/D Balance
Valley	145	0	145	21	31	52	+93
Low land	418	0	418	213	86	299	+119
Import	0	17	17	-	-	-	+17
SC City	0	222	222	451	-	451	-229
Total	563	239	802	685	117	802	0

表 3-12　サンタクルス県の青果物生産地と仕向け地（2000年）

(Unit: 1,000 tons)

	Valley	*Low land*	*SC City*	*Sub-total*	*Outside SC*	*Export*	*Total*
Valley	21	0	79	100	17	0	117
Low land	0	210	72	282	80	0	362
SC City	0	0	0	0	0	0	0
Sub-total	21	210	151	382	97	0	479
Outside SC	0	0	161	161	-	0	174
Import	0	0	13	13	0	-	13
Total	21	210	325	569	97	0	666

表 3-13　サンタクルス県の青果物生産地と仕向け地（2005年）

(Unit: 1,000 tons)

	Valley	*Low land*	*SC City*	*Sub-total*	*Outside SC*	*Export*	*Total*
Valley	21	0	84	105	22	0	127
Low land	0	203	100	303	77	0	380
SC City	0	0	0	0	0	0	0
Sub-total	21	203	184	408	99	0	507
Outside SC	0	0	181	181	-	0	181
Import	0	0	15	15	0	-	15
Total	21	203	380	604	99	0	703

表 3-14　サンタクルス県の青果物生産地と仕向け地（2010年）

(Unit: 1,000 tons)

	Valley	*Low land*	*SC City*	*Sub-total*	*Outside SC*	*Export*	*Total*
Valley	21	0	93	114	31	0	145
Low land	0	213	119	332	86	0	418
SC City	0	0	0	0	0	0	0
Sub-total	21	213	212	446	117	0	563
Outside SC	0	0	222	222	-	0	222
Import	0	0	17	17	0	-	17
	21	213	451	685	117	0	802

表 3-15 新卸売市場における青果物取り扱い量の予測

(Unit:1,000 tons)

Year	Total marketing Volume (A)	Diect Marketing (B)	Through Wholesale Market (A) - (B)	New Wholesale Market (61%)	New Wholesale Market (70%)
2000	325	32	293	178	205
2005	380	38	342	209	239
2010	451	45	406	248	284

表　3-16　　卸売取扱い比率にアバスト市場の現況値を用いた場合の市場別・主産地別青果物流通量予測　（2005年）

Unit: 10^3 tons/year

Product	Wholesale Market					Abasto Market					Sub total	Other Market					Grand Total
	V	L	O	I	total	V	L	O	I	total		V	L	O	I	total	
P	13	9	33	15	70	7	6	0	0	13	83	0	0	0	0	0	83
T	24	5	27	0	56	6	11	0	0	17	73	0	0	0	0	0	73
V	18	2	26	0	46	11	1	0	0	12	58	0	0	0	0	0	58
B	0	26	3	0	29	0	16	0	0	16	45	0	13	0	0	13	58
F	4	1	3	0	8	1	7	67	0	75	83	0	3	22	0	25	108
Total	59	43	92	15	209	25	41	67	0	133	342	0	16	22	0	38	380

Unit: 10^3 tons/year

Product	Valley	Low land	Outside dept.	Import	Total
P	20	15	33	15	83
T	30	16	27	0	73
V	29	3	26	0	58
B	0	55	3	0	58
F	5	11	92	0	108
Total	84	100	181	15	380

Remarks: (1) P: Potato, T: Tomato, V: Other Vegetables
B: Banana, F: Other Fruits
(2) V: Valley Area, L: Lowland, O: Outside Department S.C.
I : Import
(3) Existing share of wholesale trade in Abasto Market for total inflow volume to Santa Cruz excluding volume not through Abasto market and New Wholesale Market is 61%.

Source: Field Survey of Phase II of Feasibility Study for the Improvement of the Agricultural Marketing System in Santa Cruz, Bolivia, 1998

表 3-17 卸売取扱い比率にアバスト市場の現況値を用いた場合の市場別・主産地別青果物流通量予測 (2010年)

Unit: 10^3 tons/year

Product	Wholesale Market					Abasto Market					Sub total	Other Market					Grand Total
	V	L	O	I	total	V	L	O	I	total		V	L	O	I	total	
P	14	11	40	17	82	8	7	0	0	15	97	0	0	0	0	0	97
T	25	7	33	0	65	8	12	0	0	20	85	0	0	0	0	0	85
V	20	2	32	0	54	12	2	0	0	14	68	0	0	0	0	0	68
B	0	31	4	0	35	0	19	0	0	19	54	0	15	0	0	15	69
F	4	1	11	0	16	2	9	75	0	86	102	0	3	27	0	30	132
Total	63	52	120	17	252	30	49	75	0	154	406	0	18	27	0	45	451

Unit: 10^3 tons/year

Product	Valley	Low land	Outside dept.	Import	Total
P	22	18	40	17	97
T	33	19	33	0	85
V	32	4	32	0	68
B	0	65	4	0	69
F	6	13	113	0	132
Total	93	119	222	17	451

Remarks: (1) P: Potato, T: Tomato, V: Other Vegetables
B: Banana, F: Other Fruits
(2) V: Valley Area, L: Lowland, O: Outside Department S.C.
I : Import
(3) Existing share of wholesale trade in Abasto Market for total inflow volume to Santa Cruz excluding volume not through Abasto market and New Wholesale Market is 61%.

Source: Field Survey of Phase II of Feasibility Study for the Improvement of the Agricultural Marketing System in Santa Cruz, Bolivia, 1998

表 3-18 卸売取扱い比率に予測値を用いた場合の市場別・主産地別青果物流通量予測 (2005年)

Unit: 10^3 tons/year

Product	Wholesale Market					Abasto Market					Sub total	Other Market					Grand Total
	V	L	O	I	total	V	L	O	I	total		V	L	O	I	total	
P	13	9	33	15	70	7	6	0	0	13	83	0	0	0	0	0	83
T	24	5	27	0	56	6	11	0	0	17	73	0	0	0	0	0	73
V	18	2	26	0	46	11	1	0	0	12	58	0	0	0	0	0	58
B	0	26	3	0	29	0	16	0	0	16	45	0	13	0	0	13	58
F	4	1	33	0	38	1	7	37	0	45	83	0	3	22	0	25	108
Total	59	43	122	15	239	25	41	37	0	103	342	0	16	22	0	38	380

Unit: 10^3 tons/year

Product	Valley	Low land	Outside dept.	Import	Total
P	20	15	33	15	83
T	30	16	27	0	73
V	29	3	26	0	58
B	0	55	3	0	58
F	5	11	92	0	108
Total	84	100	181	15	380

Remarks: (1) P: Potato, T: Tomato, V: Other Vegetables
B: Banana, F: Other Fruits
(2) V: Valley Area, L: Lowland, O: Outside Department S.C.
I : Import
(3) Share of wholesale trade after introductionof New Wholesale Market for total inflow volume to Santa Cruz excluding volume not through Abasto market and New Wholesale Market is 70%.

Source: Field Survey of Phase II of Feasibility Study for the Improvement of the Agricultural Marketing System in Santa Cruz, Bolivia, 1998

表 3-19　卸売取扱い比率に予測値を用いた場合の市場別・主産地別青果物流通量予測　(2010年)

Unit: 10^3 tons/year

Product	Wholesale Market					Abasto Market					Sub total	Other Market					Grand Total
	V	L	O	I	total	V	L	O	I	total		V	L	O	I	total	
P	14	11	40	17	82	8	7	0	0	15	97	0	0	0	0	0	97
T	25	7	33	0	65	8	12	0	0	20	85	0	0	0	0	0	85
V	20	2	32	0	54	12	2	0	0	14	68	0	0	0	0	0	68
B	0	31	4	0	35	0	19	0	0	19	54	0	15	0	0	15	69
F	4	1	43	0	48	2	9	43	0	54	102	0	3	27	0	30	132
Total	63	52	152	17	284	30	49	43	0	122	406	0	18	27	0	45	451

Unit: 10^3 tons/year

Product	Valley	Low land	Outside dept.	Import	Total
P	22	18	40	17	97
T	33	19	33	0	85
V	32	4	32	0	68
B	0	65	4	0	69
F	6	13	113	0	132
Total	93	119	222	17	451

Remarks: (1) P: Potato, T: Tomato, V: Other Vegetables
B: Banana, F: Other Fruits
(2) V: Valley Area, L: Lowland, O: Outside Department S.C.
I : Import
(3) Share of wholesale trade after introductionof New Wholesale Market for total inflow volume to Santa Cruz excluding volume not through Abasto market and New Wholesale Market is 70%.

Source: Field Survey of Phase II of Feasibility Study for the Improvement of the Agricultural Marketing System in Santa Cruz, Bolivia, 1998

表 3-20　新規卸売市場計画候補地の評価結果

Criteria	Ranking of each alternative site for the criteria	
	UV189 in St.Cruz	Site in La Guardia City
1 Position of wholesale market development in the framework of regional development plan (PDMs and Guidline of Metropolitan Development Plan)	-	+
2 Accessibility for products suppliers (Accessibility from main incoming route i.e. national road No. 4,7,9 and 6, railway to Brazil)	Equal	Equal
3 Accessibility for users of the wholesale market in consumption area (proximity to St. Cruz, accessibility to public traffic system for the city dwellers)	+	-
4 Management ability of facilities maintenance of City Government (financial ability, organization/human-resources, experience of similar projects)	+	-
5 Management ability of users' organization (financial/management ability concerned with dominant members)	+	-
6 Sustainability (unstability in coordination for relation between city government, operation organization, users and private developer / sustainability from city government's experience)	+	-
7 Site condition (condition of public utilities)	Equal	Equal
8 Land Acquisition etc. (difficulties of land acquisition, necessity of large scale land preparation, shortage of infrastructure)	-	+
9 Linkage with other project (influence of linkage with other private projects concerned with agri-products marketing)	Equal	Equal
10 Environmental Impact Assessment to the future conditions of Abasto Market / New Wholesale Market (social impact / environmental impact)	+	[illegible]
11 Project Evaluation (economic/financial reliabilities and income redistribution)	+	[illegible]
12 Effective Technology Transfer to the related persons	+	[illegible]

Remark :

The marks shown in this table (+, -, and Equal) have following meanings. If the score of one site is higher than the other's, this site gets "+". On the other hand, if the score of one site is lower than the other's, this site gets "-". And if the scores of 2 alternative sites are equal, 2 sites get "Equal".

表 3-21　アバスト市場から新規卸売市場への卸売業者移転予測

Name of organization	Number of wholesalers through criteria						Traded volume by wholesalers qualified (tons/week)	
	Samples	Qualification Criteria (1)					Case 1 (2)	Case 2 (3)
		1	2	3	4	5		
1, Abasto Market								
Coperativa	46	24	24	23	23	19	520	450
19 Marzo	56	32	32	30	30	25	854	689
ASPROA	33	8	8	8	8	7	118	108
Non association	27	7	7	7	6	5	122	99
ACPAMA	5	1	1	1	1	1	14	14
ASOPROCA	23	13	13	8	8	2	256	134
AIPPA	14	11	11	9	9	6	132	84
Subtotal	*234*	*96*	*96*	*86*	*85*	*65*	*2016*	*1556*
2, Mutualista Market	30	3	3	3	3	2	42	22
Total	*264*	*99*	*99*	*89*	*88*	*67*	*2058*	*1578*
	(100%)				(33%)	(25%)		

Assumption:
(1) Qualification criteria
1) Traded volume by wholesalers more than 10 tons/week
2) Traded amount by wholesalers more than $US 10,000
3) Activity as wholesaler: selling percentage for general consumers less than 40%
4) Mode of payment: cash
5) Willingness to move: yes
(2) Case 1: Traded volume by qualified wholesalers with criteria 1 to 4
(3) Case 2: Traded volume by qualified wholesalers with criteria 1 to 5

Source: Field Survey of Phase I of Feasibility Study for the Impovement of Agricultural Marketing System in Santa Cruz, Bolivia, 1998

表 3-22 既存卸売業者の収支状況 （ジャガイモ取扱業者）-1/5

Unit: Bs

Item	Fixed Cost	Viable cost	Sum
1. Revenue (sales)	-	722,800	722,800
2. Expenditure (purchase)	-	676,000	676,000
Gross income	-	46,800	46,800
3. Other expenditure	4,454	16,016	20,470
(1) Labor cost	-	15,600	15,600
(2) Packing material cost	-	416	416
(3) Sales section rental fee	2,681	-	2,681
(4) O/M cost	1,473	-	1,473
(5) Tax	300	-	300
4. Profit before tax	-	-	26,630
5. Pofit after tax	-	-	26,330

Remarks:

(1) Assumption

Product	: Potato
Handling volume	: 10 ton/week = 520 ton/year
Loss in wholesale stage	: 0%
Purchasing price	: Bs 15/@ = Bs 1.30/kg = Bs 1,300/ton x 520 ton/year = Bs 676,000/year
Sales price	: Bs 16/@ = Bs 1.39/kg = Bs 1,390/ton x 520 ton/year = Bs 722,800/year
Labor cost	: Bs 3/bag = Bs 0.03/kg = Bs 30/ton x 520 ton/year = Bs 15,600/year
Packing material cost	: Bs 2/bag (Life span: 25 times use) x 10 bags/ton = Bs 20/ton/25 times = Bs 0.8/ton x 520 ton/year = Bs 416/year
Sales section rental fee	: Bs 2,681/year
Operation/maintenance cost (O/M)	: Bs 1,473/year
Tax	: Bs 300/year

(2) Sales section rental fee

- Construction cost of existing cooperativa 2 Junio building: US$ 1.5 x 10^6
- Depriciation period and interest: 25 years, 14%/year
- Number of sales lot: 452 sections
- Depriciation cost per sales section: US$1.5 x 10^6x 0.1455 = US$ 218.25 x 10^3/year≒US$483/year/section = Bs 2,681/year/section

(3) O/M cost

- Salary/wages of cooperativa staff: Bs 14,400/year x 30 staff = Bs 432,000/year = Bs 956/year/section
- Utility cost of cooperativa building: Bs 16,000/month = Bs 192,000/year = Bs 425/year/section
- Maintenance cost: 0.5% of construction cost/year
  US$ 1.5 x 10^6 x 0.005 = US$ 7,500/year = Bs 41,625/year = Bs 92/year/section
- Total O/M cost = Bs 1,473/year/section

(4) Tax: simplified tax. RTS standard setting for uncalculated sales profit

表 3-22 既存卸売業者の収支状況 （トマト取扱業者）-2/5

Unit: Bs

Item	Fixed Cost	Viable cost	Sum
1. Revenue (sales)	-	453,960	453,900
2. Expenditure (purchase)	-	390,000	390,000
Gross income	-	63,960	63,960
3. Other expenditure	7,135	9,620	16,755
(1) Labor cost	-	7,800	7,800
(2) Packing material cost	-	1,820	1,820
(3) Sales section rental fee	5,362	-	5,362
(4) O/M cost	1,473	-	1,473
(5) Tax	300	-	300
4. Profit before tax	-	-	47,505
5. Pofit after tax	-	-	47,205

Remarks:

(1) Assumption

Product	: Tomato
Handling volume	: 10 ton/week = 520 ton/year
Loss in wholesale stage	: 3%
Purchasing price	: Bs 15/box = Bs 0.75/kg = Bs 750/ton x 520 ton/year = Bs 390,000/year
Sales price	: Bs 18/box = Bs 0.90/kg = Bs 900/ton x 520 ton/year x 0.97 = Bs 453,960/year
Labor cost	: Bs 3/10 box = Bs 0.015/kg = Bs 15/ton x 520 ton/year = Bs 7,800/year
Packing material cost	: Bs 3.5/box (Life span: 50 times use) x 50 box/ton = Bs 175/ton/50 times= Bs 3.5/ton x 520 ton/year = Bs 1,820/year
Sales section rental fee	: Bs 2,681/year
Operation/maintenance cost (O/M)	: Bs 1,473/year
Tax	: Bs 300/year

(2) Sales section rental fee

・Construction cost of existing cooperativa 2 Junio building: US$ 1.5×10^6

・Depriciation period and interest: 25 years, 14%/year

・Number of sales lot: 452 sections

・Depriciation cost per sales section: US$$1.5 \times 10^6 \times 0.1455$ = US$ 218.25×10^3/year

≒US$483/year/section = Bs 2,681/year/section

(3) O/M cost

・Salary/wages of cooperativa staff: Bs 14,400/year x 30 staff = Bs 432,000/year = Bs 956/year/section

・Utility cost of cooperativa building: Bs 16,000/month = Bs 192,000/year = Bs 425/year/section

・Maintenance cost: 0.5% of construction cost/year

US$ $1.5 \times 10^6 \times 0.005$ = US$ 7,500/year = Bs 41,625/year = Bs 92/year/section

・Total O/M cost = Bs 1,473/year/section

(4) Tax: simplified tax. RTS standard setting for uncalculated sales profit

表 3-22 既存卸売業者の収支状況 (タマネギ取扱業者) -3/5

Unit: Bs

Item	Fixed Cost	Viable cost	Sum
1. Revenue (sales)	-	270,400	270,400
2. Expenditure (purchase)	-	202,800	202,800
Gross income	-	67,600	67,600
3. Other expenditure	4,454	16,016	20,470
(1) Labor cost	-	15,600	15,600
(2) Packing material cost	-	416	416
(3) Sales section rental fee	2,681	-	2,681
(4) O/M cost	1,473	-	1,473
(5) Tax	300	-	300
4. Profit before tax	-	-	47,430
5. Pofit after tax	-	-	47,130

Remarks:

(1) Assumption

Product	: Onion
Handling volume	: 10 ton/week = 520 ton/year
Loss in wholesale stage	: 0%
Purchasing price	: Bs 4.5/@ = Bs 0.39/kg = Bs 390/ton x 520 ton/year = Bs 202,800/year
Sales price	: Bs 6.0/@ = Bs 0.52/kg = Bs 520/ton x 520 ton/year = Bs 270,400/year
Labor cost	: Bs 3/bag = Bs 0.03/kg = Bs 30/ton x 520 ton/year = Bs 15,600/year
Packing material cost	: Bs 2/bag (Life span: 25 times use) x 10 bags/ton = Bs 20/ton/25 times = Bs 0.8/ton x 520 ton/year = Bs 416/year
Sales section rental fee	: Bs 2,681/year
Operation/maintenance cost (O/M)	: Bs 1,473/year
Tax	: Bs 300/year

(2) Sales section rental fee

- Construction cost of existing cooperativa 2 Junio building: US$ 1.5 x 10^6
- Depriciation period and interest: 25 years, 14%/year
- Number of sales lot: 452 sections
- Depriciation cost per sales section: US$1.5 x 10^6x 0.1455 = US$ 218.25 x 10^3/year≒US$483/year/section = Bs 2,681/year/section

(3) O/M cost

- Salary/wages of cooperativa staff: Bs 14,400/year x 30 staff = Bs 432,000/year = Bs 956/year/section
- Utility cost of cooperativa building: Bs 16,000/month = Bs 192,000/year = Bs 425/year/section
- Maintenance cost: 0.5% of construction cost/year
  US$ 1.5 x 10^6 x 0.005 = US$ 7,500/year = Bs 41,625/year = Bs 92/year/section
- Total O/M cost = Bs 1,473/year/section

(4) Tax: simplified tax. RTS standard setting for uncalculated sales profit

表 3-22 既存卸売業者の収支状況 (バナナ取扱業者) -4/5

Unit: Bs

Item	Fixed Cost	Viable cost	Sum
1. Revenue (sales)	-	166,400	166,400
2. Expenditure (purchase)	-	143,000	143,000
Gross income	-	23,400	23,400
3. Other expenditure	4,454	2,600	7,054
(1) Labor cost	-	2,600	2,600
(2) Packing material cost	-	-	0
(3) Sales section rental fee	2,681	-	2,681
(4) O/M cost	1,473	-	1,473
(5) Tax	300	-	300
4. Profit before tax	-	-	16,646
5. Pofit after tax	-	-	16,346

Remarks:

(1) Assumption

Product	: Banana (Platano)
Handling volume	: 10 ton/week = 520 ton/year
Loss in wholesale stage	: 25%
Purchasing price	: Bs 5.5/racimo (20kg) = Bs 275/ton x 520 ton/year = Bs 143,000
Sales price	: Bs 8/racimo (20kg) = Bs 400/ton x 520 ton/year x 0.8 = Bs 166,400
Labor cost	: Bs 0.1/racimo = Bs 5/ton x 520/ton/year = Bs 2,600/year
Packing material cost	: 0
Sales section rental fee	: Bs 2,681/year
Operation/maintenance cost (O/M)	: Bs 1,473/year
Tax	: Bs 300/year

(2) Sales section rental fee

- Construction cost of existing cooperativa 2 Junio building: US\$ 1.5×10^6
- Depriciation period and interest: 25 years, 14%/year
- Number of sales lot: 452 sections
- Depriciation cost per sales section: US\$$1.5 \times 10^6 \times 0.1455$ = US\$ 218.25×10^3/year≒US\$483/year/section = Bs 2,681/year/section

(3) O/M cost

- Salary/wages of cooperativa staff: Bs 14,400/year x 30 staff = Bs 432,000/year = Bs 956/year/section
- Utility cost of cooperativa building: Bs 16,000/month = Bs 192,000/year = Bs 425/year/section
- Maintenance cost: 0.5% of construction cost/year
  US\$ $1.5 \times 10^6 \times 0.005$ = US\$ 7,500/year = Bs 41,625/year = Bs 92/year/section
- Total O/M cost = Bs 1,473/year/section

(4) Tax: simplified tax. RTS standard setting for uncalculated sales profit

表 3-22 既存卸売業者の収支状況 （柑橘類取扱業者）-5/5

Unit: Bs

Item	Fixed Cost	Viable cost	Sum
1. Revenue (sales)	-	389,880	389,880
2. Expenditure (purchase)	-	376,200	376,200
Gross income	-	13,680	13,680
3. Other expenditure	4,454	5,970	10,424
(1) Labor cost	-	2,550	2,550
(2) Packing material cost	-	3,420	3,420
(3) Sales section rental fee	2,681	-	2,681
(4) O/M cost	1,473	-	1,473
(5) Tax	300	-	300
4. Profit before tax	-	-	3,556
5. Pofit after tax	-	-	3,256

Remarks:

(1) Assumption

Product	: Citrus Fruites (Naranju), Seasonal fruite harvest 4 month/year
Handling volume	: 10 ton/week = 171 ton/year
Loss in wholesale stage	: 5%
Purchasing price	: Bs 22/100 unidad = Bs 22/10kg = Bs 2,200/ton x 171 ton/year = Bs 376,200/year
Sales price	: Bs 24/100 unidad = Bs 24/10kg = Bs 2,400/ton x 171 ton x 0.95 = Bs 389,880/year
Labor cost	: Bs 1.5/10 box (10kg) = Bs 0.015/kg = Bs 15/ton x 170 = Bs 2,550/year
Packing material cost	: Bs 5/box (Life span 25 times use) x 100 box/ton = Bs 500/ton/25 times = Bs 20/ton x 171 ton/year = Bs 3,420/year
Sales section rental fee	: Bs 2,681/year
Operation/maintenance cost (O/M)	: Bs 1,473/year
Tax	: Bs 300/year

(2) Sales section rental fee

- Construction cost of existing cooperativa 2 Junio building: US$ 1.5 x 10^6
- Depriciation period and interest: 25 years, 14%/year
- Number of sales lot: 452 sections
- Depriciation cost per sales section: US$1.5 x 10^6x 0.1455 = US$ 218.25 x 10^3/year≒US$483/year/section = Bs 2,681/year/section

(3) O/M cost

- Salary/wages of cooperativa staff: Bs 14,400/year x 30 staff = Bs 432,000/year = Bs 956/year/section
- Utility cost of cooperativa building: Bs 16,000/month = Bs 192,000/year = Bs 425/year/section
- Maintenance cost: 0.5% of construction cost/year

  US$ 1.5 x 10^6 x 0.005 = US$ 7,500/year = Bs 41,625/year = Bs 92/year/section
- Total O/M cost = Bs 1,473/year/section

(4) Tax: simplified tax. RTS standard setting for uncalculated sales profit

表 3-23 卸売業者の損益分岐点

Unit: Bs

Item	Potato	Tomato	Onion	Banana	Citrus fruites
FC (Bs.)	4,454	7,135	4,454	4,454	4,454
VC (Bs.)	692,016	399,620	218,816	145,600	382,170
Vcu (Bs/kg)	1.331	0.769	0.421	0.28	2.23
Pu (Bs/kg)	1.390	0.900	0.520	0.40	2.40
Pu-Vcu (Bs/kg)	0.059	0.131	0.099	0.12	0.17
Qe (kg/year)	75,492	54,465	44,989	37,117	26,220
Qe (ton/week)	1.50	1.05	0.87	0.71	0.50

Remarks:

(1) Equation of Break Even Point

Qe = FC/Pu-Vcu

Qe = Break-even point (kg)

FC: Fixed Cost (Bs.)

VC: Variable Cost (Bs.)

Vcu: Variable Cost per unit (Bs/kg)

Pu: Unit Price (Bs/kg)

表 4-1 UV189とその近隣地区における新規卸売市場建設候補地の概要

	Site A	Site B	Site C
1. Location	1. This site is convenient to users because it's along directly to Route 4. 2. No room for future extension 3. In UV189	1. Located approx. 400m south-east from route 4 2. There is room for future extension. 3. In UV189	1. Located approx. 1.4 km from Route 4 and 500 m from Ring Road 8th. 2. Room for future extension is large 3. In ZAPU next to UV189
2. Infrastructure	Equipped with road and main line of potable water, electricity / telephone. (in the zone of non sewage)	1. City Gov'nt has projected road from Route 4. It's necessary to prepare access road to Ring Road 8th. 2. Equipped with electric main line. 3. Not equipped with potable water main line. (in the zone of non sewage)	1. City Gov'nt has projected roads from Rout 4 and Ring Road 8th (projected road from Ring Road dose not touch with Site C directly). Budget and construction schedule are now under investigation. (*1)。 2. Not equipped with potable water main line. (in the zone of non sewage) 3. Not equipped with electric main line (under investigation).
3. Social Impact etc.	1. High tonnage truck flow to/from Site will disturb the traffic flow of future Route 4 (It's now under construction for hi-way). 2. Inflow of wasted water from new wholesale market to Route 4 will lessen the value of Route 4. 3. Predicted street venders will disturb the traffic flow on Route 4.	1. Temporal residences and chicken farm facilities exist in the site. Social problems from expropriation will supposedly occur.	1. Benefit of projected road from Route 4/Ring Road 8th will rise-up by new wholesale market. 2. No possibility of traffic jam and social problems
4. Land Price	Highest	Low	Lowest

Remark *1 : Budget and construction schedule of these 2 projected roads are now under investigation. But according to the explanation by Director of Public Work Section of Santa Cruz City, road pavement budget of 1999 dose not includes the budget for these 2 projected roads.

表 5-1　産地集出荷場の必要床面積

			Planned handling volume				No. of unloading trucks		Sorting				Productd stocking		Loading	Box/basket stocking area				Total platform area	
Production Area	Products Item		peak season collection volume (ton/month) A	planed operation days per month B	planned average handling volume (ton/day) C=A/B	peak handling volume (ton/day) D=C*1.5	unloading tonnage of dominant trucks (ton)	no. of unloading trucks (trucks/day)	sorter's working capacity (ton/day/man) E	required sorters (persons/day) F=D/E	required floor area for sorter (m2/person) G	required sorting area (m2) H=F*G	tonnage stockable in 1 m2 (ton/m2) I	required stocking area (m2) J=D/I*1.5	required unloading / loading area (approx. m2) K=J*0.27	required tomato-box stocking area (m2) M=D/1.34	required lettuce-basket stocking area (m2) N=D/0.45	required piment-basket stocking area (m2) O=D/0.36	total box/basket stocing area (m2) P=(M+N+O)*1.5	total floor area of platform and box/basket stocking area Q=H+J+K+P	Required no. of platform unit R=Q/112.5m2
Samaipata	Potato	Feb	530	30	17.67	26.50	3.00	8.83	1.25	21.20	2.00	42.40	0.5	79.50							
	Tomato		120	30	4.00	6.00	3.00	2.00	1.25	4.80	2.00	9.60	0.6	15.00		4.48					
	Other Fruits		260	30	8.67	13.00	3.00	4.33	1.25	10.40	2.00	20.80	0.6	32.50		9.70					
	Total		910			45.50		15.17		36.40		72.80		127.00	34.29	14.18			21.27	255.36	-
Mairana	Potato	Nov	130	30	4.33	6.50	3.00	2.17	1.25	5.20	2.00	10.40	0.5	19.50							
	Tomato		100	30	3.33	5.00	3.00	1.67	1.25	4.00	2.00	8.00	0.6	12.50		3.73					
	Lettuce		120	30	4.00	6.00	0.75	8.00	-	0.00	0.00	0.00	0.09	100.00			13.33				
	Other Vege		60	30	2.00	3.00	3.00	1.00	1.25	2.40	2.00	4.80	0.6	7.50							
	Other Fruits		430	30	14.33	21.50	3.00	7.17	1.25	17.20	2.00	34.40	0.6	53.75		16.04					
	Total		840			42.00		20.00		28.80		57.60		193.25	52.18	19.78	13.33		49.66	352.69	3.14
P. Grande	Potato	Oct	850	30	28.33	42.50	3.00	14.17	1.25	34.00	2.00	68.00	0.5	127.50							
	Tomato		200	30	6.67	10.00	3.00	3.33	1.25	8.00	2.00	16.00	0.6	25.00		7.46					
	Lettuce		250	30	8.33	12.50	0.75	16.67	-	0.00	0.00	0.00	0.09	208.33			27.78				
	Other Vege		140	30	4.67	7.00	3.00	2.33	1.25	5.60	2.00	11.20	0.6	17.50							
	Citrus		0	30	0.00	0.00	3.00	0.00	1.25	0.00	2.00	0.00	0.6	0.00		0.00					
	Total		1,440			72.00		36.50		47.60		95.20		378.33	102.15	7.46	27.78		52.86	628.54	5.59
Comarapa	Potato	Nov	580	30	19.33	29.00	3.00	9.67	1.25	23.20	2.00	46.40	0.5	87.00							
	Tomato		190	30	6.33	9.50	3.00	3.17	1.25	7.60	2.00	15.20	0.6	23.75		7.09					
	Piment		50	30	1.67	2.50	0.60	4.17	-	0.00	0.00	0.00	0.07	53.57				6.94			
	Other Vege		60	30	2.00	3.00	3.00	1.00	1.25	2.40	2.00	4.80	0.6	7.50							
	Other Fruits		0	30	0.00	0.00	3.00	0.00	1.25	0.00	2.00	0.00	0.6	0.00		0.00					
	Total		880			44.00		18.00		33.20		66.40		171.82	46.39	7.09		6.94	21.05	305.66	2.72
San Isidro	Potato	Nov	680	30	22.67	34.00	3.00	11.33	1.25	27.20	2.00	54.40	0.5	102.00							
	Tomato		190	30	6.33	9.50	3.00	3.17	1.25	7.60	2.00	15.20	0.6	23.75		7.09					
	Corn		410	30	13.67	20.50	3.00	6.83	1.25	16.40	2.00	32.80	0.5	61.50							
	Other Vege		260	30	8.67	13.00	3.00	4.33	1.25	10.40	2.00	20.80	0.6	32.50							
	Other Fruits		0	30	0.00	0.00	3.00	0.00	1.25	0.00	2.00	0.00	0.6	0.00							
	Total		1,540			77.00		25.67		61.60		123.20		219.75	59.33	7.09			10.63	412.92	-
Saipina	Potato	Sep	890	30	29.67	44.50	3.00	14.83	1.25	35.60	2.00	71.20	0.5	133.50							
	Tomato		470	30	15.67	23.50	3.00	7.83	1.25	18.80	2.00	37.60	0.6	58.75		17.54					
	Other Vege		120	30	4.00	6.00	3.00	2.00	1.25	4.80	2.00	9.60	0.6	15.00							
	Total		1,480			74.00		24.67		59.20		118.40		207.25	55.96	17.54			26.31	407.91	3.63
V. Grande	Potato	Mar	500	30	16.67	25.00	3.00	8.33	1.25	20.00	2.00	40.00	0.5	75.00							
	Tomato		370	30	12.33	18.50	3.00	6.17	1.25	14.80	2.00	29.60	0.6	46.25		13.81					
	Other Vege		80	30	2.67	4.00	3.00	1.33	1.25	3.20	2.00	6.40	0.6	10.00							
	Other Fruits		330	30	11.00	16.50	3.00	5.50	1.25	13.20	2.00	26.40	0.6	41.25		12.31					
	Total		1,280			64.00		15.83		38.00		76.00		172.50	46.58	26.12			39.18	334.25	2.97

表 5-2　新規卸売市場・マーケットホール -1 の必要床面積

Target year	Estimated consumption volume in Santa Cruz City (ton/year)	Planned handling volume not through Abasto Market and New Wholesale Market (ton/year)	Planned handling volume in Abasto Market and New Wholesale Market (ton/year)		Products items and their planned handling volume in New Wholesale Market A		planed operation days per year B	Planned average handling volume (ton/day) C=A/B	peak handling volume (ton/day) D=C*1.5		Products stocking area: tonnage stockable in 1 m2 (ton/m2) I	Products stocking area: required stocking area (m2) J=D/I	Units: required no. of wholesalers section K=J/11.25m2
			Abasto Market	New W. Market	Item	volume (ton/year)							
2005	380,000	38,000	103,000	239,000	Potato / Onion	116,000	365	317.81	476.71	D=C*1.5	0.5	953.42	
					Banana	29,000	365	79.45	119.18	D=C*1.5	0.4	297.95	
					Fruits (Citrus)	38,000	365	104.11	156.16	D=C*1.5	0.6	260.27	
												86.76	Fruit Box
					Tomato	56,000	365	153.42	230.14	D=C*1.5	0.6	383.56	
												127.85	Fruit Box
					Total	239,000			982.19			2,109.82	187.54
2010	451,000	45,000	122,000	284,000	Potato / Onion	136,000	365	372.60	558.90	D=C*1.5	0.5	1,117.81	
					Banana	35,000	365	95.89	143.84	D=C*1.5	0.4	359.59	
					Fruits (Citrus)	48,000	365	131.51	197.26	D=C*1.5	0.6	328.77	
												109.59	Fruit Box
					Tomato	65,000	365	178.08	267.12	D=C*1.5	0.6	445.21	
												148.40	Fruit Box
					Total	284,000			1,167.12			2,509.36	223.05

Remark : 1. Wholesalers unit 3 m x 5 m
2. 1 cluster of wholesalers unit : 56 units / 2005 : 56 units/cluster x 3 cluster + 20 units = 188 units, 2010 : 56 units/cluster x 4 cluster = 224 units

表 5-3　新規卸売市場建設工事工程