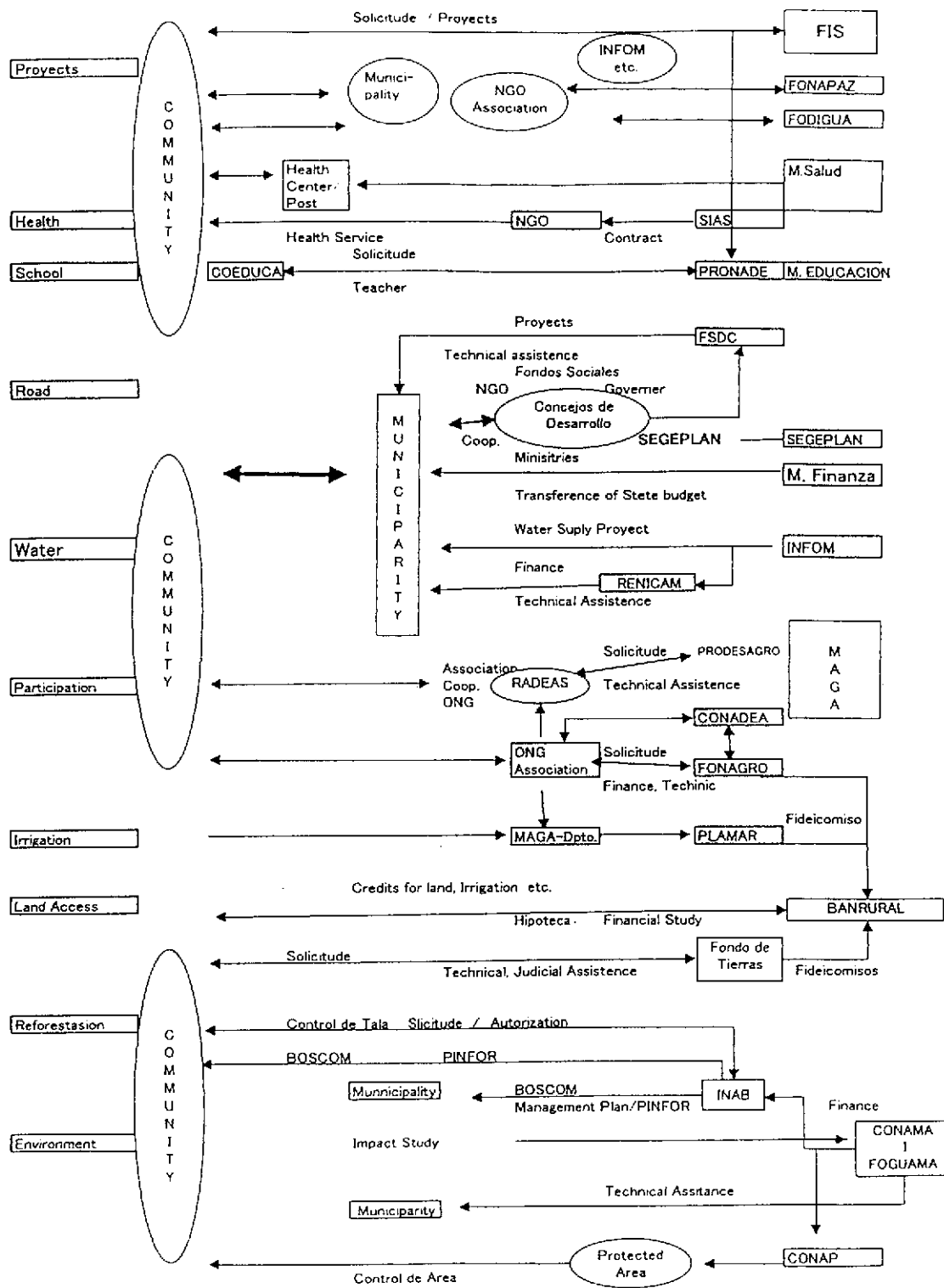


GRÁFICAS

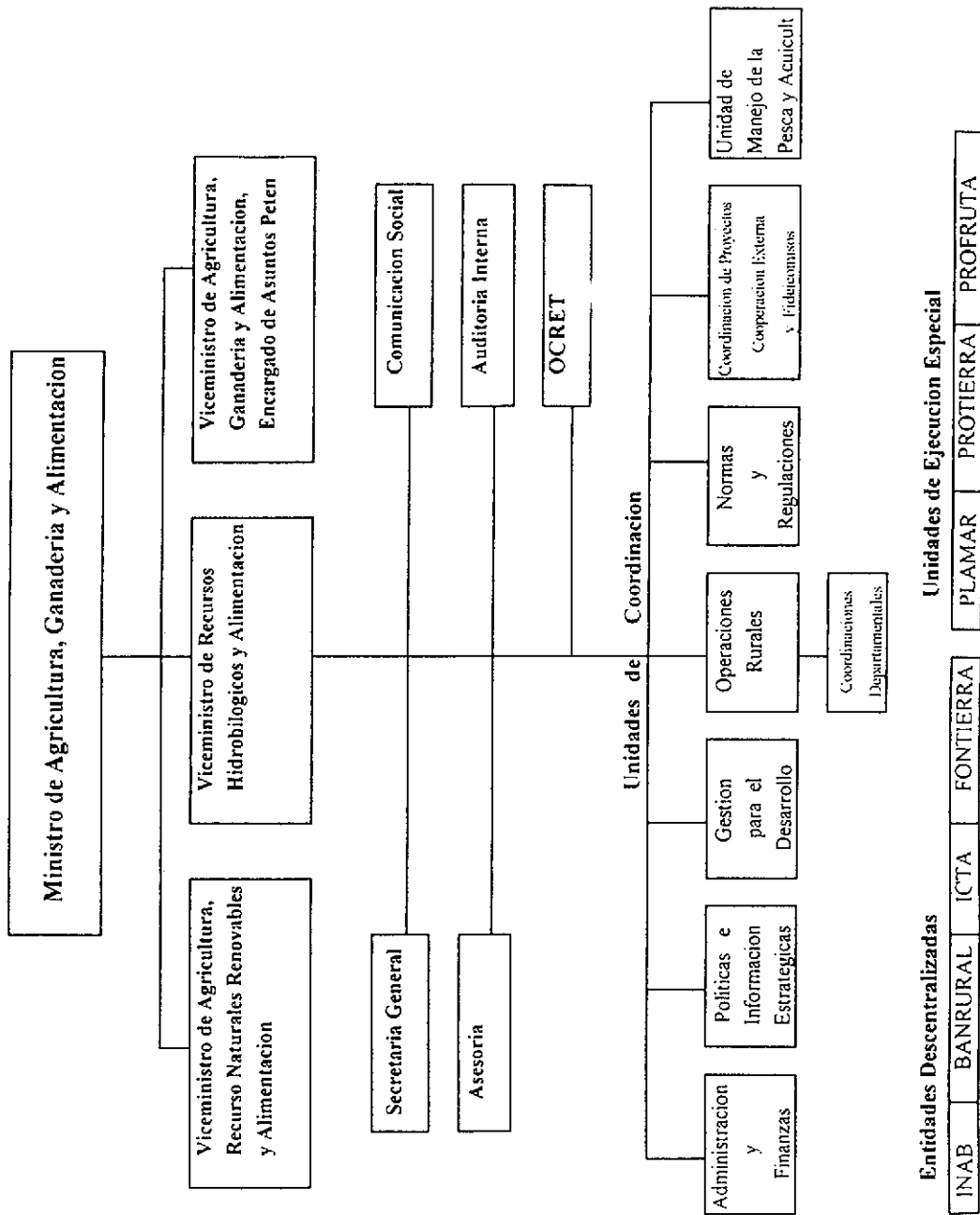


THE MASTER PLAN STUDY ON SUSTAINABLE RURAL DEVELOPMENT FOR THE REDUCTION OF POVERTY IN THE CENTRAL HIGHLAND REGION OF THE REPUBLIC OF GUATEMALA

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Gráfica 3.1.3(1)

Organizaciones Involucrados en el Proceso de Desarrollo

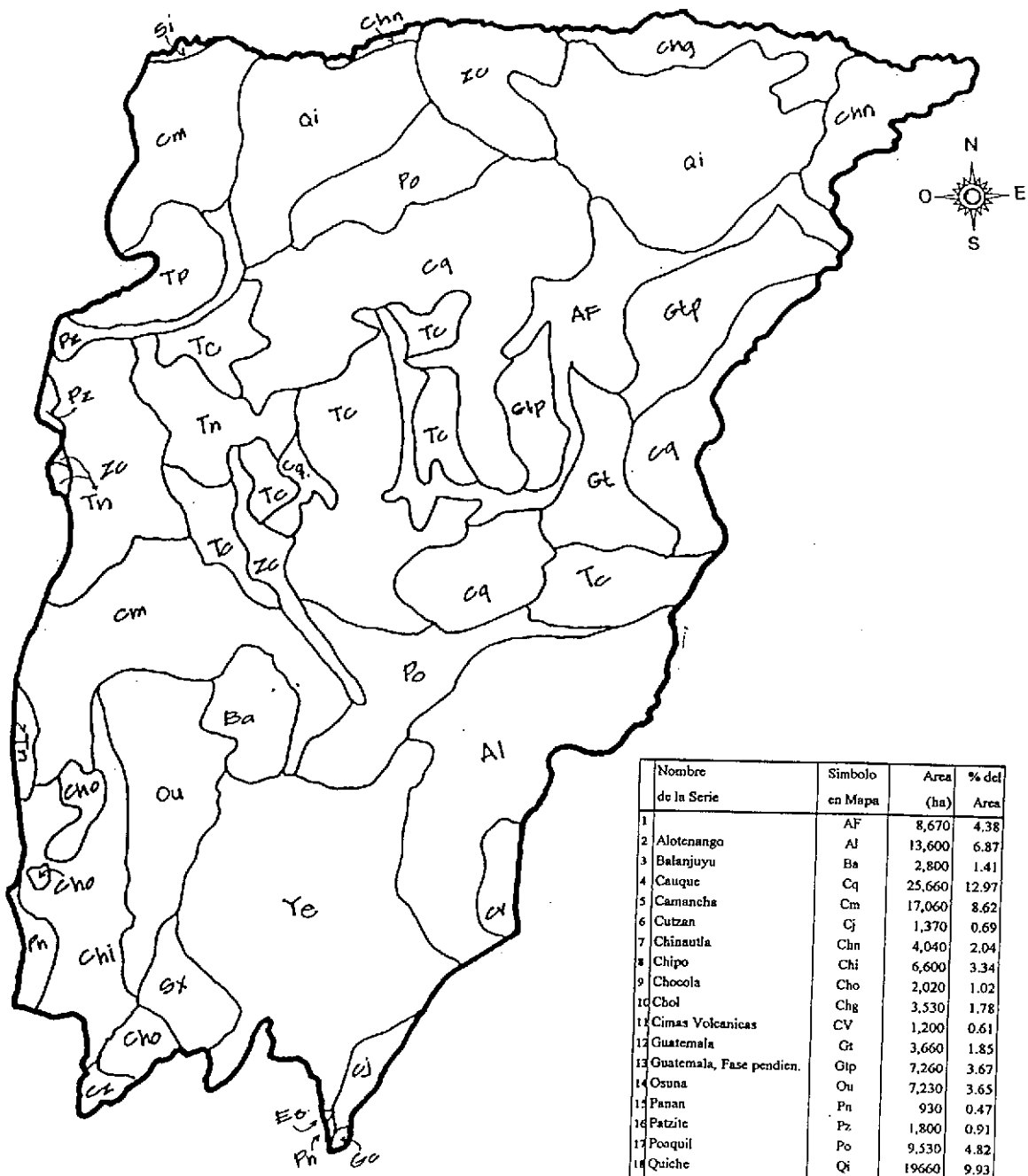


THE MASTER PLAN STUDY ON SUSTAINABLE RURAL DEVELOPMENT FOR THE REDUCTION OF POVERTY IN THE CENTRAL HIGHLAND REGION OF THE REPUBLIC OF GUATEMALA

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Gráfica 3.1.3(2)

Organismos del Ministerio de Agricultura

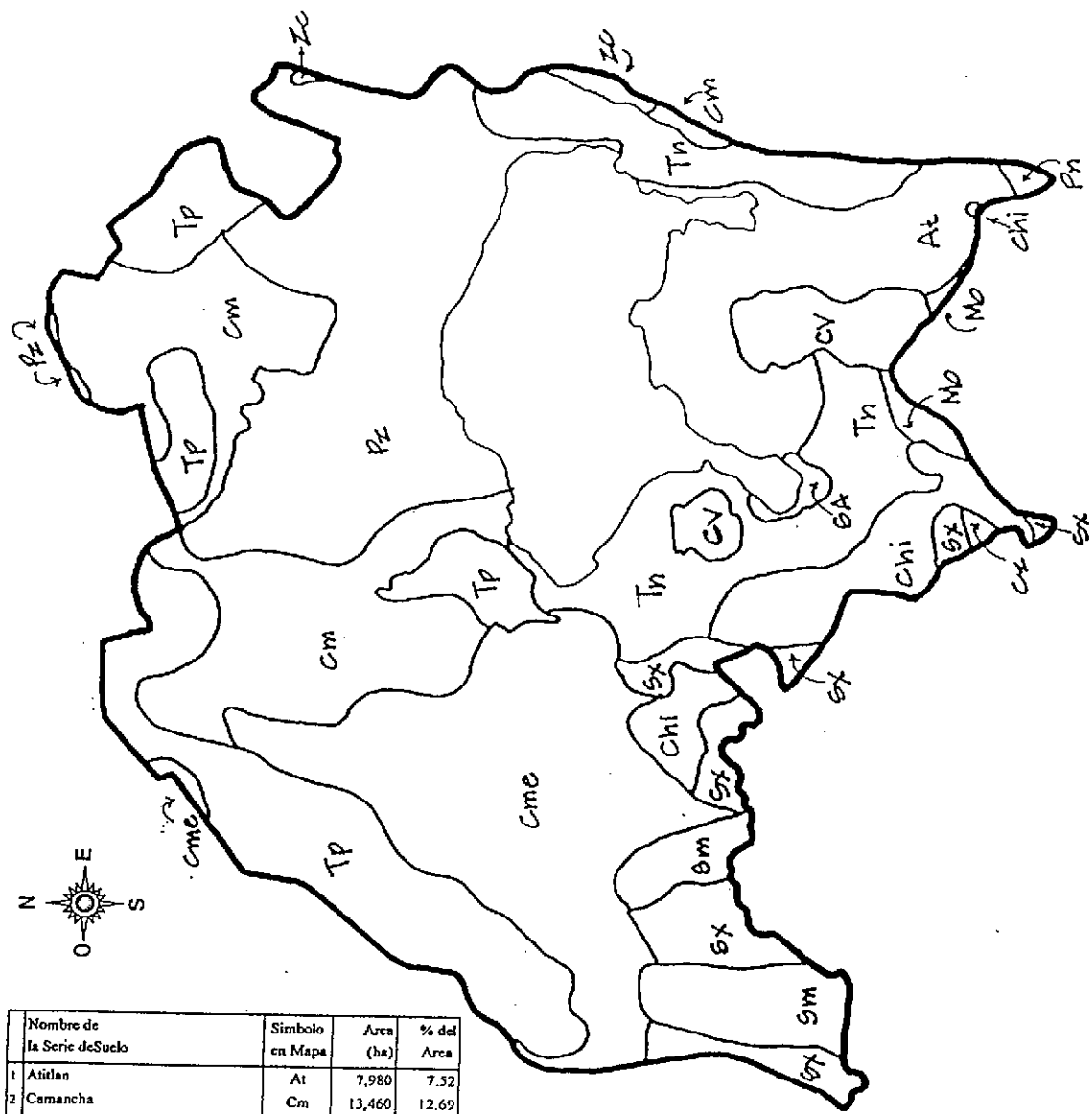


Nombre de la Serie	Simbolo en Mapa	Area (ha)	% del Area
1	AF	8,670	4.38
2 Alotenango	AJ	13,600	6.87
3 Balanjuyu	Ba	2,800	1.41
4 Cauque	Cq	25,660	12.97
5 Camancha	Cm	17,060	8.62
6 Cutzan	Cj	1,370	0.69
7 Chinautla	Chn	4,040	2.04
8 Chipo	Chi	6,600	3.34
9 Chocola	Cho	2,020	1.02
10 Chol	Chg	3,530	1.78
11 Cimas Volcanicas	CV	1,200	0.61
12 Guatemala	Gt	3,660	1.85
13 Guatemala, Fase pendien.	Glp	7,260	3.67
14 Osuna	Ou	7,230	3.65
15 Panan	Pn	930	0.47
16 Patzic	Pz	1,800	0.91
17 Poaquil	Po	9,530	4.82
18 Quiche	Qi	19,660	9.93
19 Salama	Sl	180	0.09
20 Suchitepequez	Sx	2,270	1.15
21 Tecpan	Tc	19,400	9.80
22 Toliman	Tn	4,970	2.51
23 Toloncapan	Tp	3,070	1.55
24 Yepocapa	Yc	18,530	9.36
25 Zacualpa	Zc	12,860	6.50
Total		197,900	100

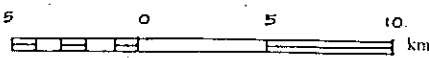
THE MASTER PLAN STUDY ON SUSTAINABLE RURAL DEVELOPMENT FOR THE REDUCTION OF POVERTY IN THE CENTRAL HIGHLAND REGION OF THE REPUBLIC OF GUATEMALA

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Gráfica 3.1.4(1)
Mapa de Suelos del Departamento de Chimaltenango



Nombre de la Serie de Suelo	Simbolo en Mapa	Area (ha)	% del Area
1 Atitlan	At	7,980	7.52
2 Camancha	Cm	13,460	12.69
3 Camancha, Quebrada erosionado	Cme	15,110	14.24
4 Chipo	Chi	4,390	4.14
5 Cimas Volcanicas	CV	2,740	2.58
6 Moca	Mo	790	0.74
7 Panan	Pn	190	0.18
8 Patzite	Pz	15,510	14.62
9 Suelo Aluvial no diferenciado	SA	380	0.36
10 Suchitepequez	Sx	4,940	4.66
11 Samayac	Sm	3,610	3.40
12 Toliman	Tn	10,340	9.75
13 Totonicapán	Tp	13,700	12.91
14 Zacualpa	Zc	460	0.43
Lago Atitlan		12,500	11.78
Total		106,100	100

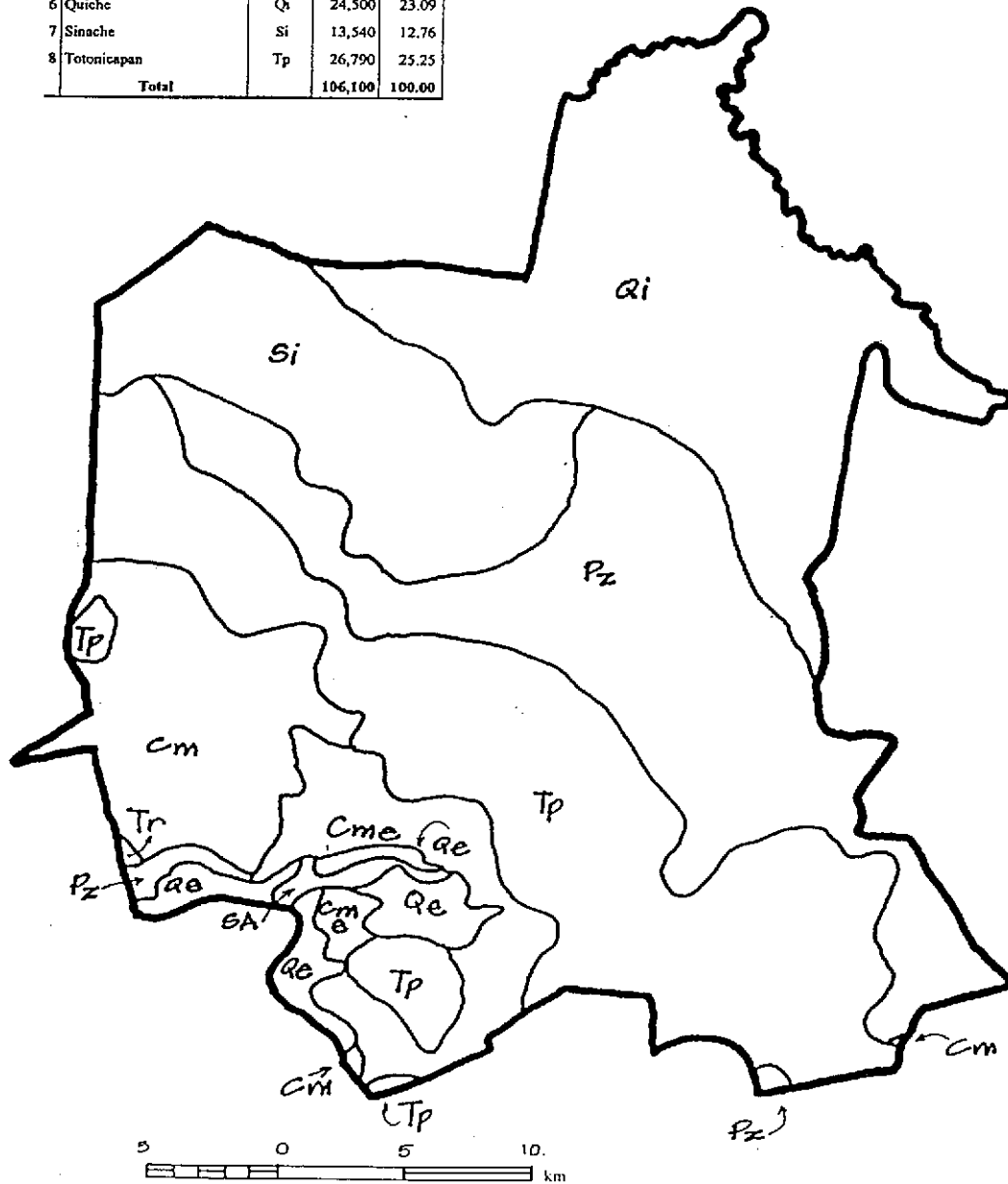
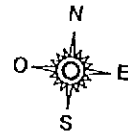


THE MASTER PLAN STUDY ON SUSTAINABLE RURAL DEVELOPMENT FOR THE REDUCTION OF POVERTY IN THE CENTRAL HIGHLAND REGION OF THE REPUBLIC OF GUATEMALA

Gráfica 3.1.4(2)
Mapa de Suelos del Departamento de Sololá

Japan International Cooperation Agency (JICA)

Nombre de Serie de Suel	Símbolo en Mapa	Área (ha)	% Área
1 Camancha	Cm	9,520	8.97
2 Camancha, Fase quebrada	Cme	6,585	6.21
3 Suelo Aluvial no diferenciado	SA	580	0.55
4 Quetzaltenango	Qe	3,085	2.91
5 Patzite	Pz	21,500	20.26
6 Quiche	Qi	24,500	23.09
7 Sinache	Si	13,540	12.76
8 Totonicapán	Tp	26,790	25.25
Total		106,100	100.00

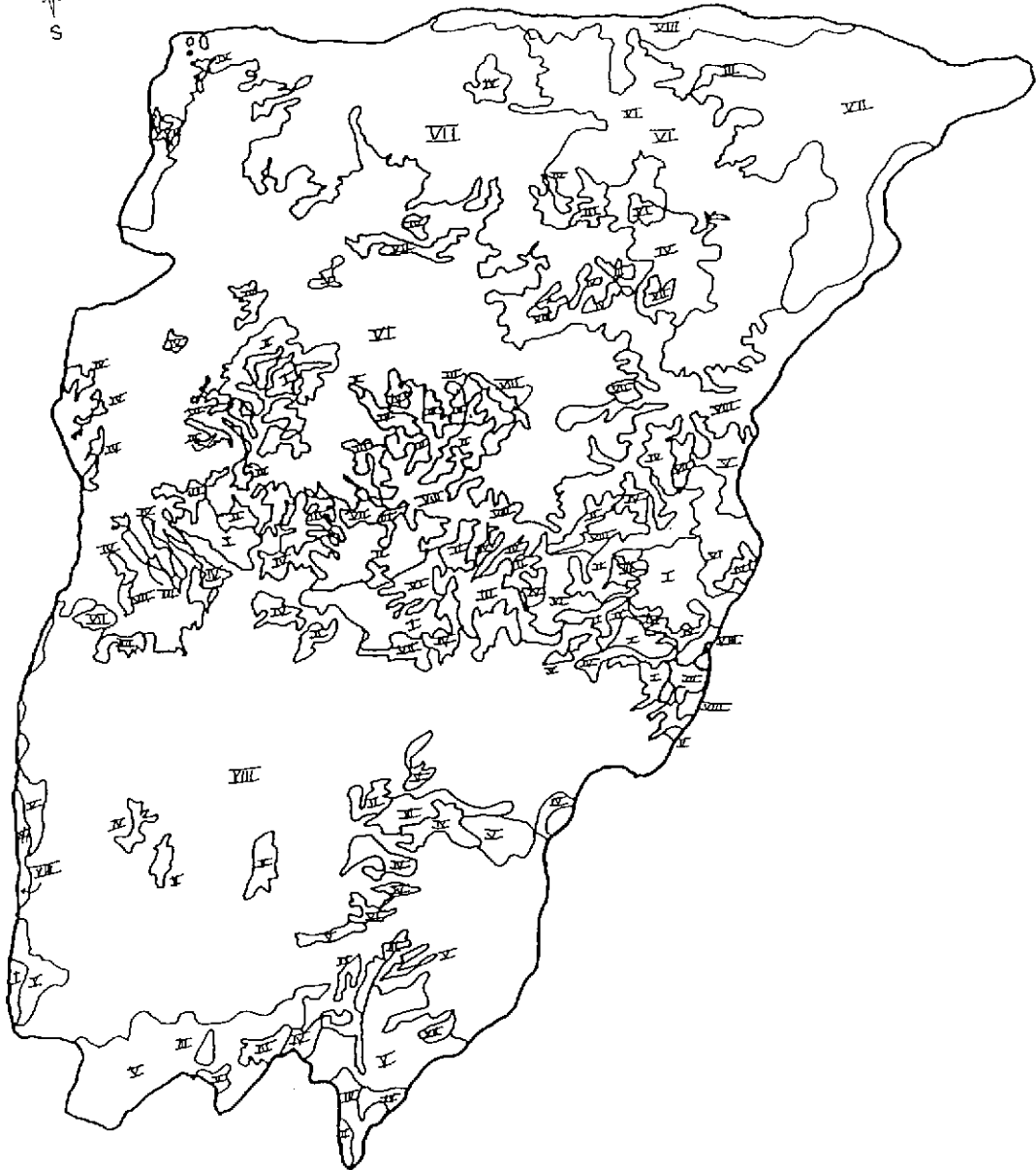
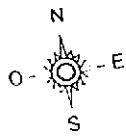


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Gráfica 3.1.4(3)

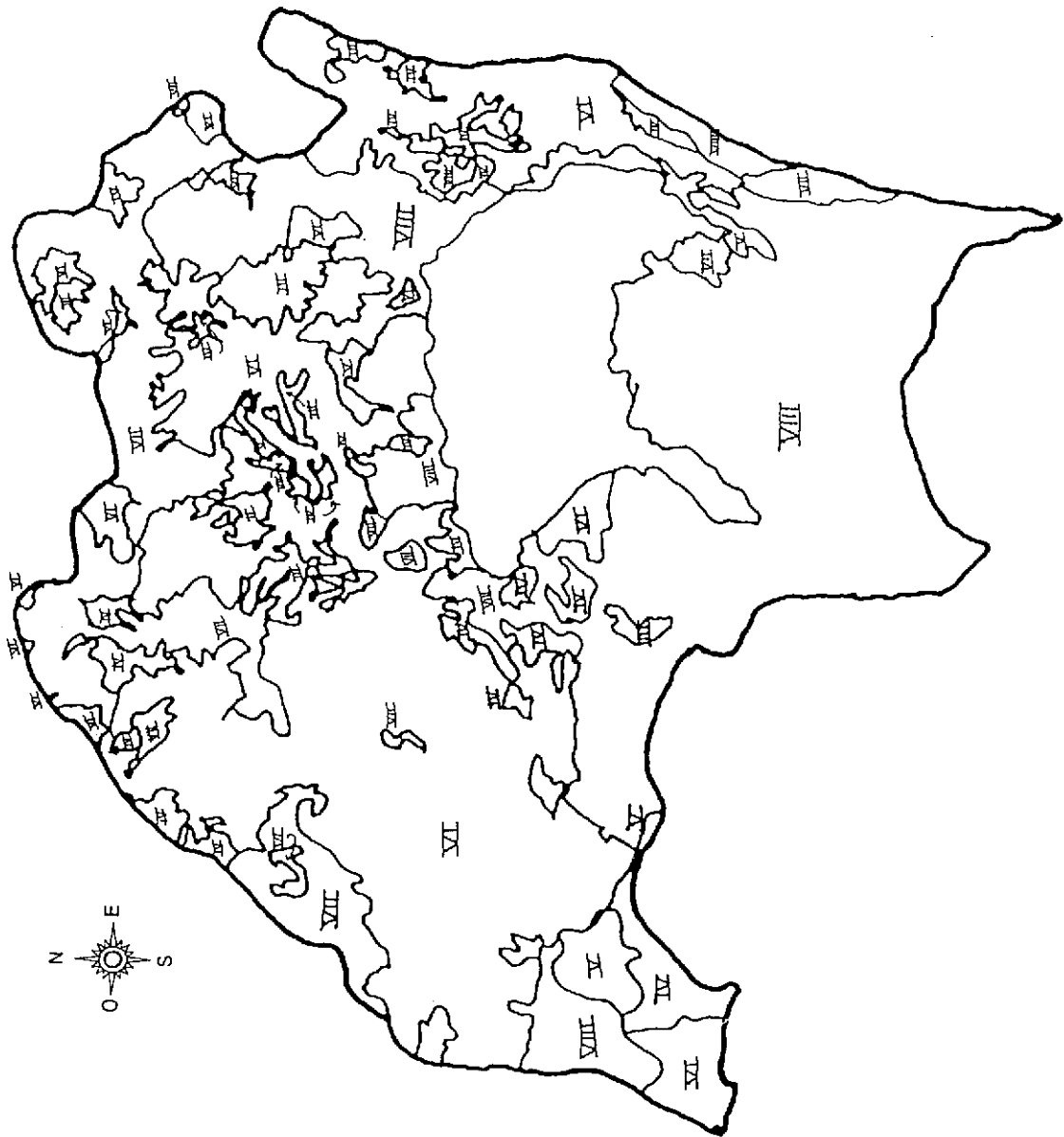
Mapa de Suelos del Departamento de Totonicapán



THE MASTER PLAN STUDY ON SUSTAINABLE RURAL DEVELOPMENT FOR THE REDUCTION OF POVERTY IN THE CENTRAL HIGHLAND REGION OF THE REPUBLIC OF GUATEMALA

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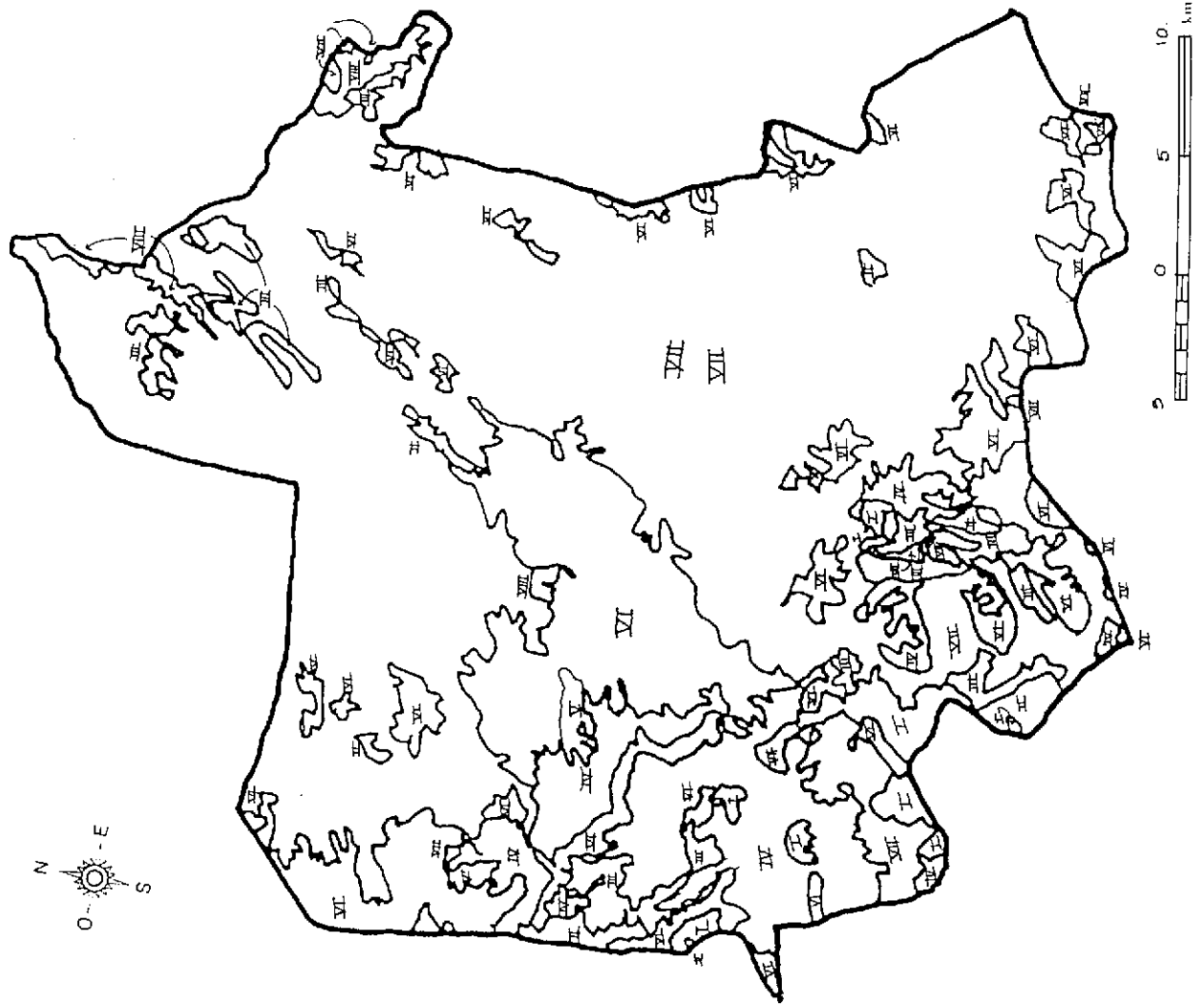
Gráfica 3.1.4(5)
Mapa de Capacidad de Uso Productivo de las Tierras de Chimaltenango



THE MASTER PLAN STUDY ON SUSTAINABLE RURAL
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Gráfica 3.1.4(6)
Mapa de Capacidad de Uso Productivo
de las Tierras de Solola

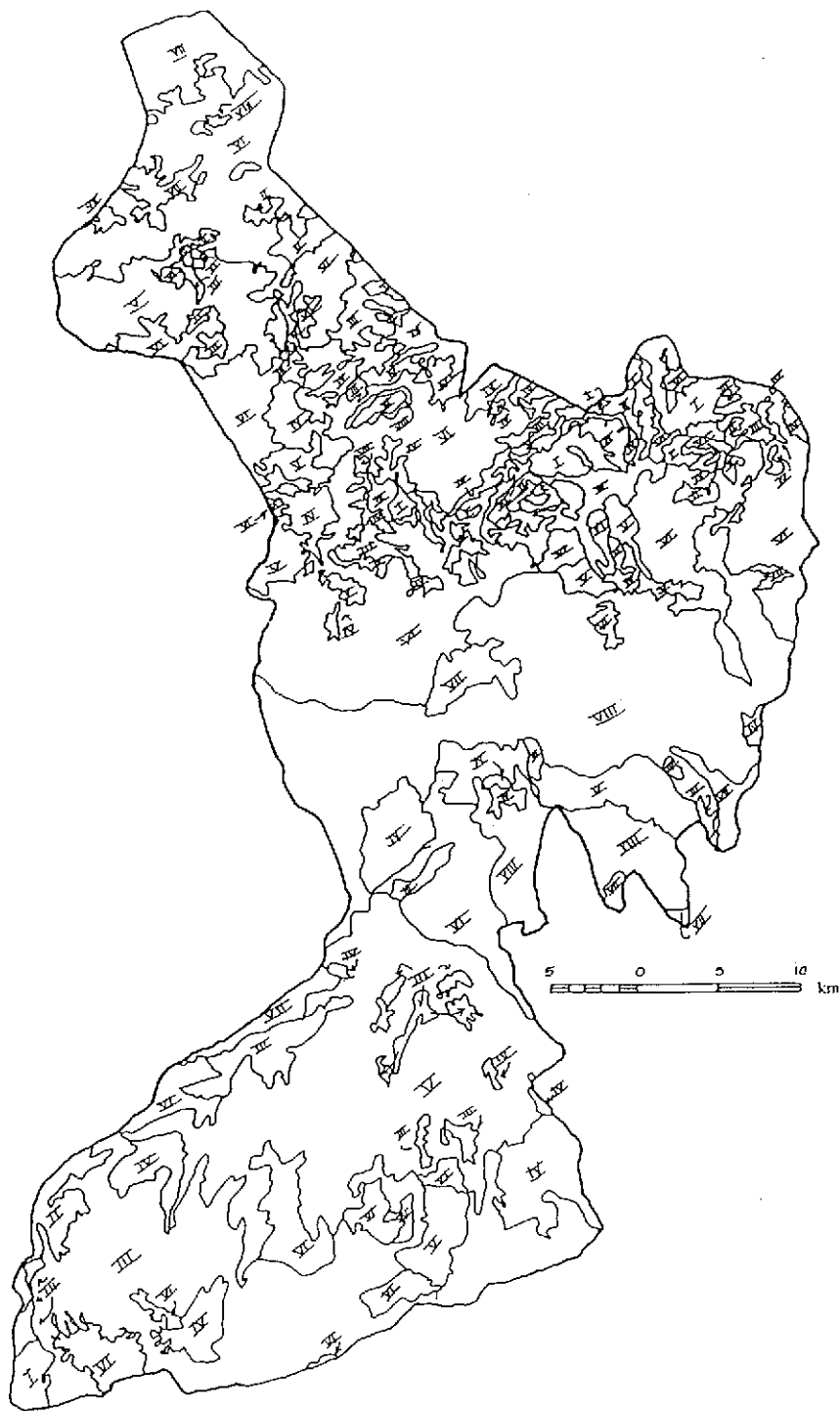


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Gráfica 3.1.4(7)

Mapa de Capacidad de Uso Productivo de
las Tierras de Totonicapán

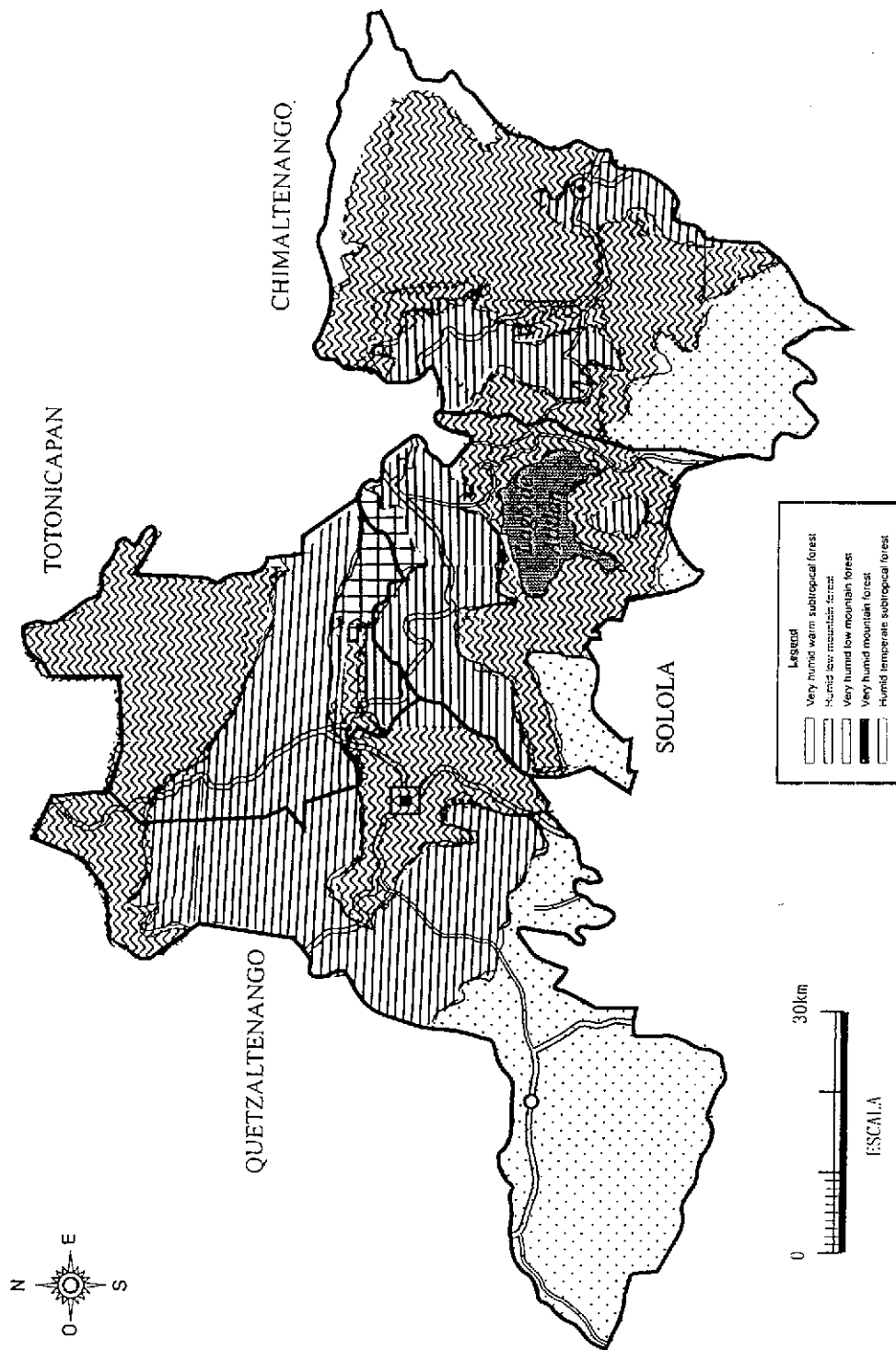


THE MASTER PLAN STUDY ON SUSTAINABLE RURAL
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Japan International Cooperation Agency (JICA)

Gráfica 3.1.4(8)

**Mapa de Capacidad de Uso Productivo de
las Tierras de Quetzaltenango**



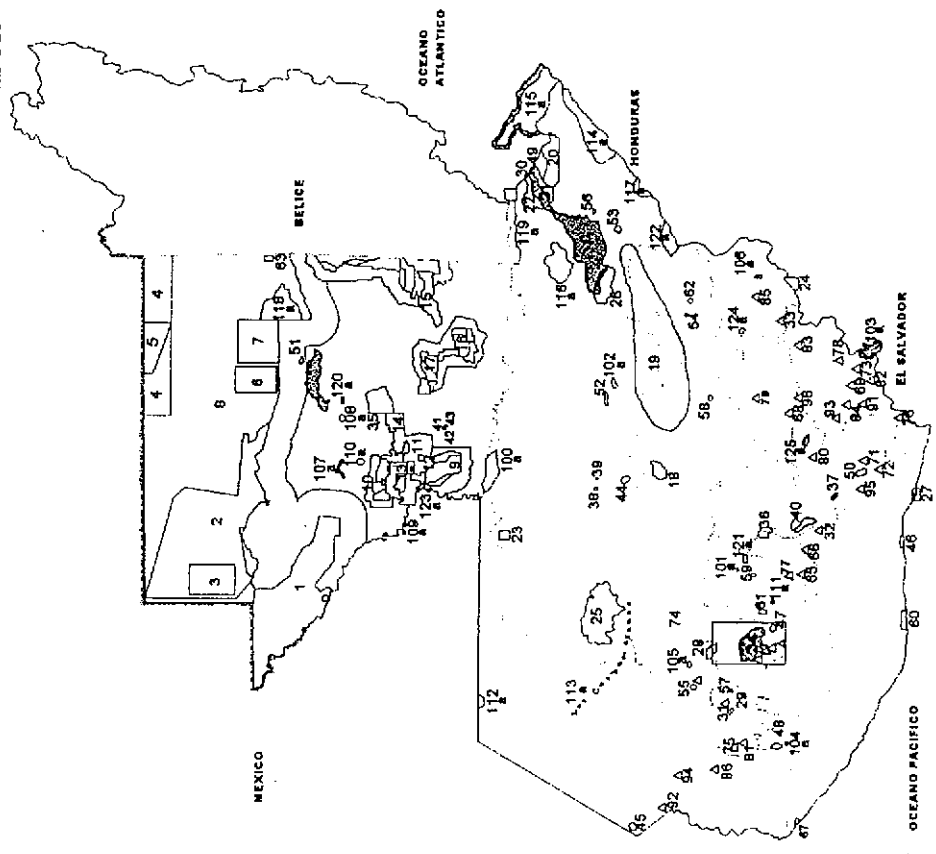
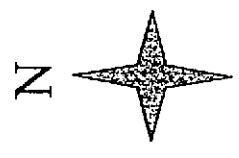
THE MASTER PLAN STUDY ON SUSTAINABLE RURAL DEVELOPMENT FOR THE REDUCTION OF POVERTY IN THE CENTRAL HIGHLAND REGION OF THE REPUBLIC OF GUATEMALA

Japan International Cooperation Agency (JICA)

Gráfica 3.1.4(10)

Distribución de zonas de Vida

SISTEMA GUATEMALTECO DE AREAS PROTEGIDAS



Según Decreto 4-89 y sus Reformas
Decretos 18-89, 110-96

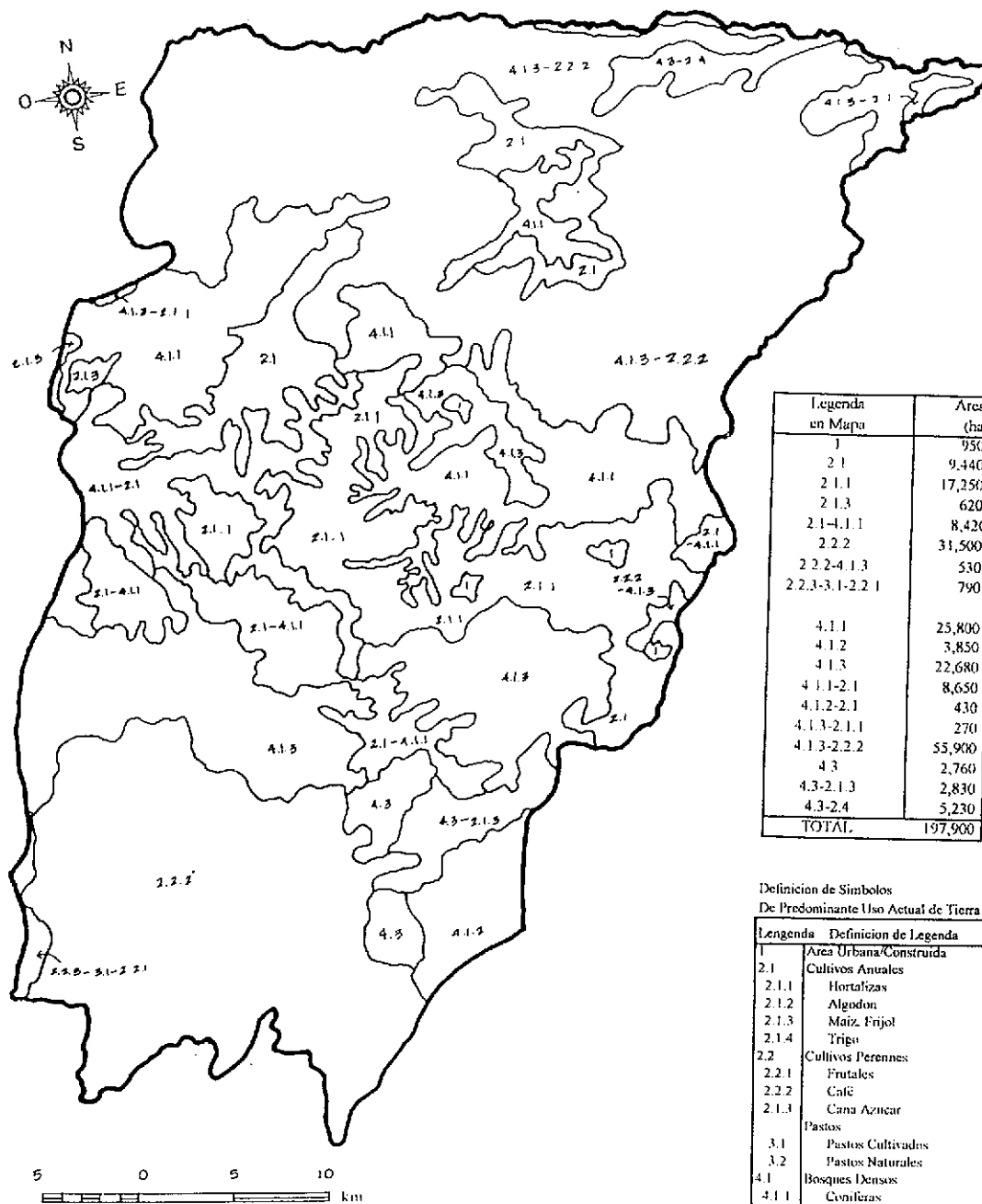
CONSEJO NACIONAL DE AREAS PROTEGIDAS
PLANAMIENTO, ESTUDIOS Y PROYECTOS
SISTEMA DE INFORMACIÓN GEOGRÁFICA
CONAP

THE MASTER PLAN STUDY ON SUSTAINABLE RURAL
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Gráfica 3.1.4(11)

Zonas de Protección en el Area de Estudio



Legenda en Mapa	Area (ha)
1	950
2.1	9,440
2.1.1	17,250
2.1.3	620
2.1-4.1.1	8,420
2.2.2	31,500
2.2.2-4.1.3	530
2.2.3-3.1-2.2.1	790
4.1.1	25,800
4.1.2	3,850
4.1.3	22,680
4.1.1-2.1	8,650
4.1.2-2.1	430
4.1.3-2.1.1	270
4.1.3-2.2.2	55,900
4.3	2,760
4.3-2.1.3	2,830
4.3-2.4	5,230
TOTAL	197,900

Definición de Símbolos
De Predominante Uso Actual de Tierra

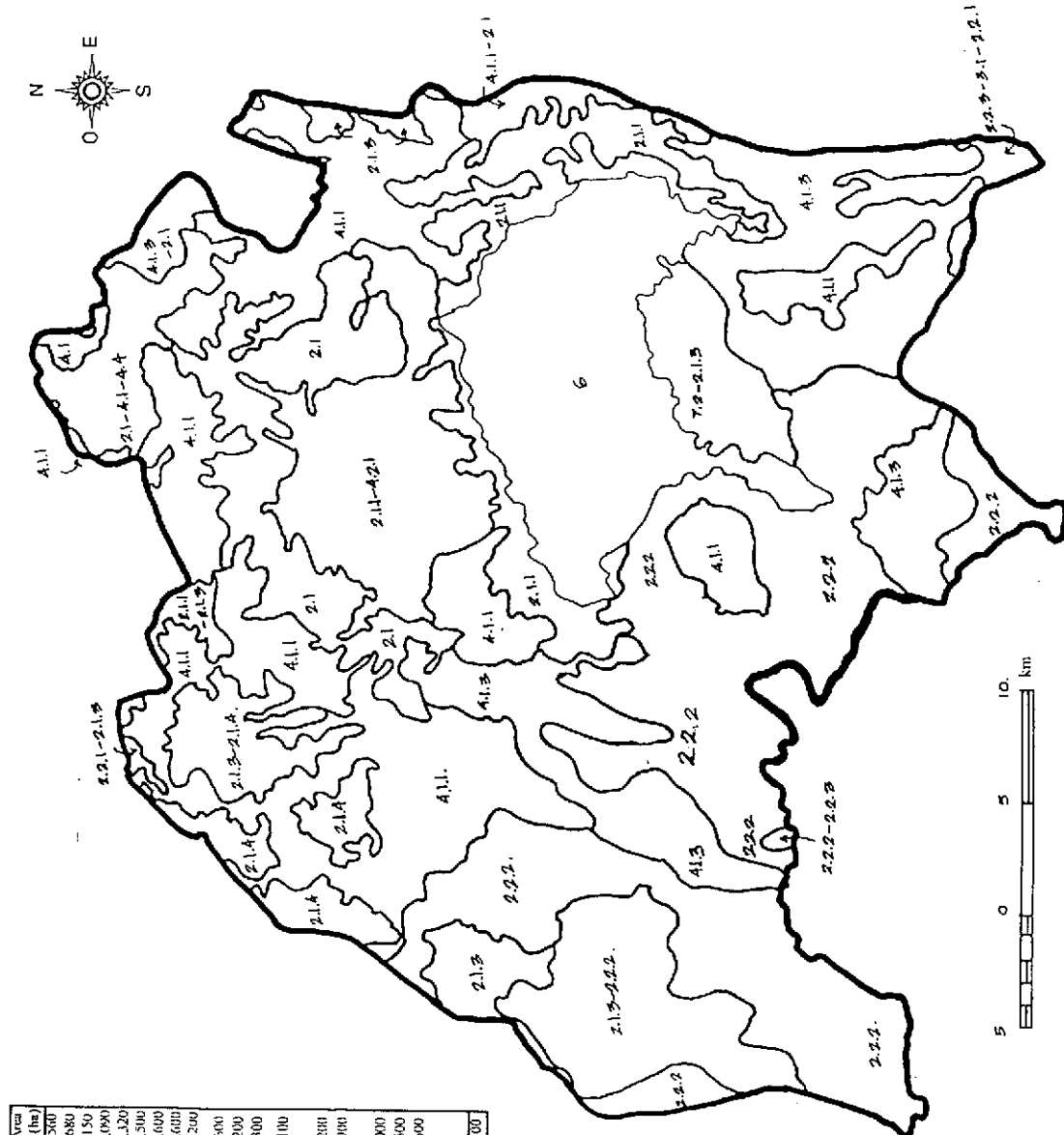
Legenda	Definición de Legenda
1	Area Urbana/Construida
2.1	Cultivos Anuales
2.1.1	Hortalizas
2.1.2	Algodon
2.1.3	Maiz, Frijol
2.1.4	Trigo
2.2	Cultivos Perennes
2.2.1	Frutales
2.2.2	Café
2.1.3	Cana Azucar
	Pastos
3.1	Pastos Cultivados
3.2	Pastos Naturales
4.1	Bosques Densos
4.1.1	Coníferas
4.1.2	Latifoliadas
4.1.3	Misto
4.2	Bosques Dispersos
4.2.1	Coníferas
4.2.2	Latifoliadas
4.2.3	Mixto
4.3	Bosque Abierto

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Gráfica 3.2.2(1)

Mapa de Uso Actual de las Tierras del Departamento de Chimaltenango



Legenda en Mapa	Area (ha)
2.1.1	11,680
2.1.3	2,150
2.1.4	2,090
2.1.1-2.1	6,320
2.1.3-2.1.3	2,500
2.1.4-2.1.4	2,600
2.1.3-2.2.2	3,600
2.2.1-2.1.4	2,200
2.2.2	19,600
2.2.2-2.2.3	2,200
2.2.3.1-2.2.1	1,300
4.1.1	20,100
4.1.2	12,200
4.1.3	900
4.1.1-2.1	1,000
4.1.2-2.1	2,500
4.1.3-2.1.1	1,900
7.2-2.1.3	2,500
LAGO	12,600
4.3-2.1.3	
4.3-2.4	
TOTAL	106,100

Definición de Símbolos
De Predominante Uso Actual de Tierra

Legenda Definición de Legenda

Área Urbana Construida	Definición de Legenda
2.1	Cultivos Anuales
2.1.1	Hortalizas
2.1.2	Algodón
2.1.3	Maz. Frijol
2.1.4	Trigo
2.2	Cultivos Perennes
2.2.1	Frutales
2.2.2	Café
2.2.3	Cana Azúcar
3	Pastos
3.1	Pastos Cultivados
3.2	Pastos Naturales
4.1	Bosques Densos
4.1.1	Coníferas
4.1.2	Lantifoliadas
4.1.3	Mixto
4.2	Bosques Dispersos
4.2.1	Coníferas
4.2.2	Lantifoliadas
4.2.3	Mixto
4.3	Bosque Abierto
4.4	Bosque Bajo Montano
7.2	Lava o Rocas

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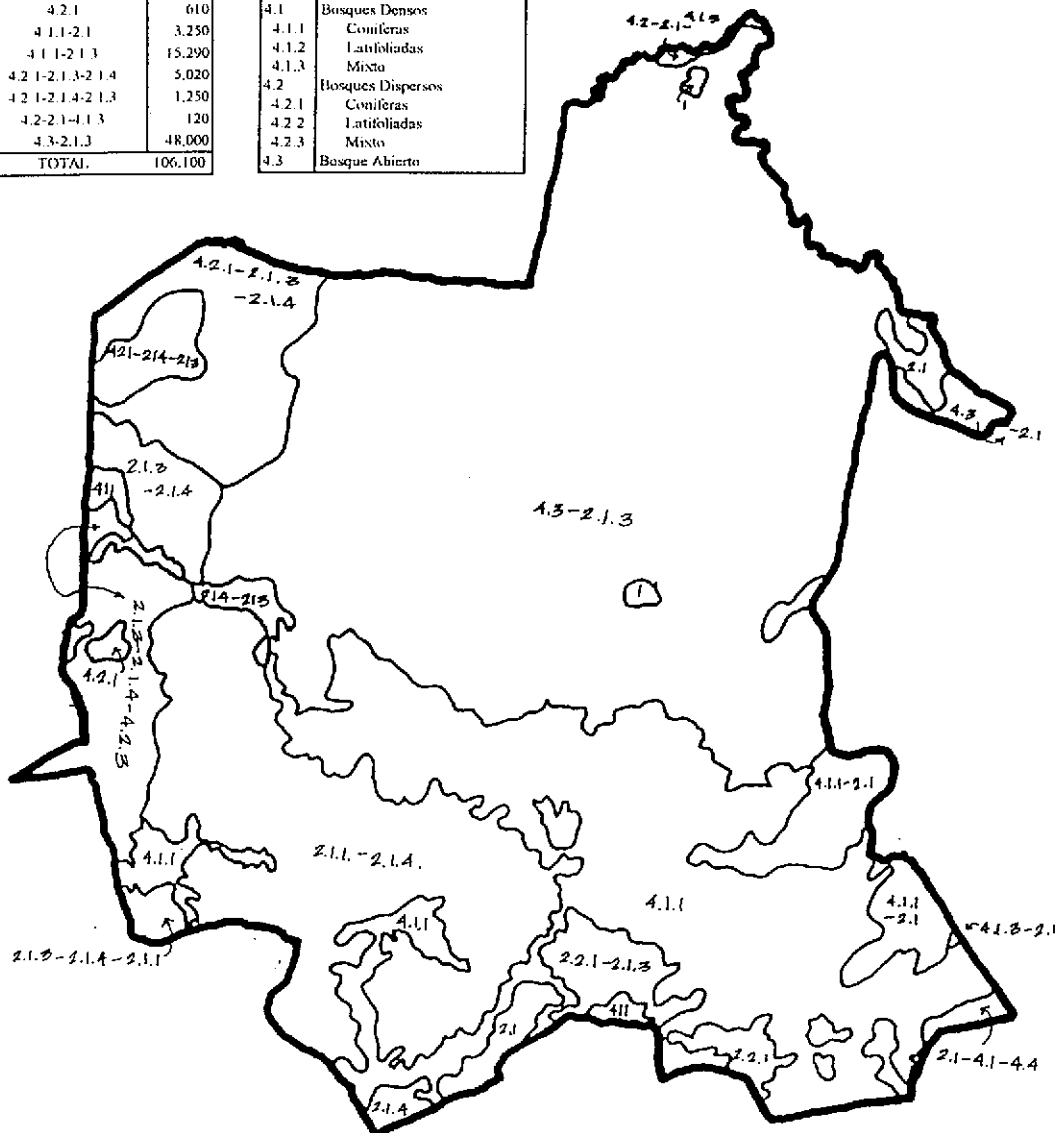
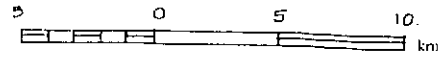
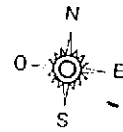
Gráfica 3.3.2(1)

Mapa de Uso Actual de las Tierras del Departamento de Sololá

Legenda en Mapa	Area (ha)
1	680
2.1	1,460
2.1.4	600
2.2.1	690
2.1.4-2.1.1	940
2.1.3-2.1.4-2.1.1	440
2.1.3-2.1.4-2.2.3	5,000
2.1-4.1-4.4	470
2.2.1-2.1.1	1,130
2.2.2	0
4.1.1	21,160
4.2.1	610
4.1.1-2.1	3,250
4.1.1-2.1.3	15,290
4.2.1-2.1.3-2.1.4	5,020
4.2.1-2.1.4-2.1.3	1,250
4.2-2.1-4.1.3	120
4.3-2.1.3	48,000
TOTAL	106,100

Definición de Símbolos
De Predominante Uso Actual de Tierra

Legenda	Definición de Legenda
1	Area Urbana Construida
2.1	Cultivos Anuales
2.1.1	Hortalizas
2.1.2	Algodon
2.1.3	Maiz, Frijol
2.1.4	Trigo
2.2	Cultivos Perennes
2.2.1	Frutales
2.2.2	Cafe
2.1.3	Cana Azucar
3.1	Pastos Cultivados
3.2	Pastos Naturales
4.1	Bosques Densos
4.1.1	Coniferas
4.1.2	Latifoliadas
4.1.3	Misto
4.2	Bosques Dispersos
4.2.1	Coniferas
4.2.2	Latifoliadas
4.2.3	Misto
4.3	Bosque Abierto

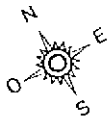


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Gráfica 3.4.2(1)

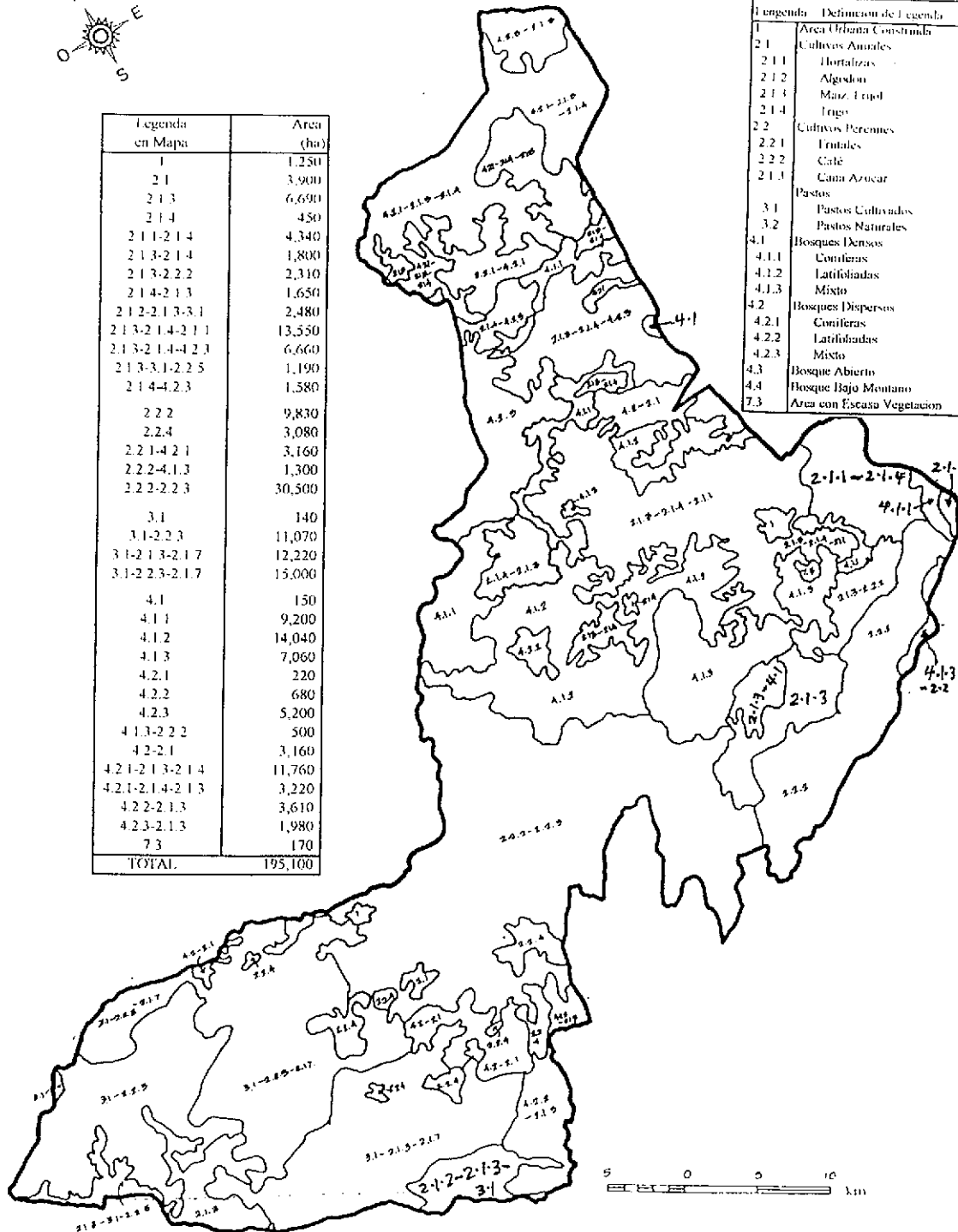
Mapa de Uso Actual de las Tierras del Departamento de Totonicapán



Legenda en Mapa	Area (ha)
1	1,250
2.1	3,900
2.1.3	6,690
2.1.4	450
2.1.1-2.1.4	4,340
2.1.3-2.1.4	1,800
2.1.3-2.2.2	2,310
2.1.4-2.1.3	1,650
2.1.2-2.1.3-3.1	2,480
2.1.3-2.1.4-2.1.1	13,550
2.1.3-2.1.4-4.2.3	6,660
2.1.3-3.1-2.2.5	1,190
2.1.4-4.2.3	1,580
2.2.2	9,830
2.2.4	3,080
2.2.1-4.2.1	3,160
2.2.2-4.1.3	1,300
2.2.2-2.2.3	30,500
3.1	140
3.1-2.2.3	11,070
3.1-2.1.3-2.1.7	12,220
3.1-2.2.3-2.1.7	15,000
4.1	150
4.1.1	9,200
4.1.2	14,040
4.1.3	7,060
4.2.1	220
4.2.2	680
4.2.3	5,200
4.1.3-2.2.2	500
4.2-2.1	3,160
4.2.1-2.1.3-2.1.4	11,760
4.2.1-2.1.4-2.1.3	3,220
4.2.2-2.1.3	3,610
4.2.3-2.1.3	1,980
7.3	170
TOTAL	195,100

Definición de Símbolos
De Predominante Uso Actual de Tierra

Legenda	Definición de Legenda
1	Área Urbana Construida
2.1	Cultivos Anuales
2.1.1	Hortalizas
2.1.2	Algodón
2.1.3	Maz, Trigo
2.1.4	Trigo
2.2	Cultivos Perennes
2.2.1	Frutales
2.2.2	Café
2.1.1	Caña Azúcar
Pastos	
3.1	Pastos Cultivados
3.2	Pastos Naturales
4.1	Bosques Densos
4.1.1	Coníferas
4.1.2	Latifoliadas
4.1.3	Mixto
4.2	Bosques Dispersos
4.2.1	Coníferas
4.2.2	Latifoliadas
4.2.3	Mixto
4.3	Bosque Abierto
4.4	Bosque Bajo Montano
7.3	Área con Escasa Vegetación

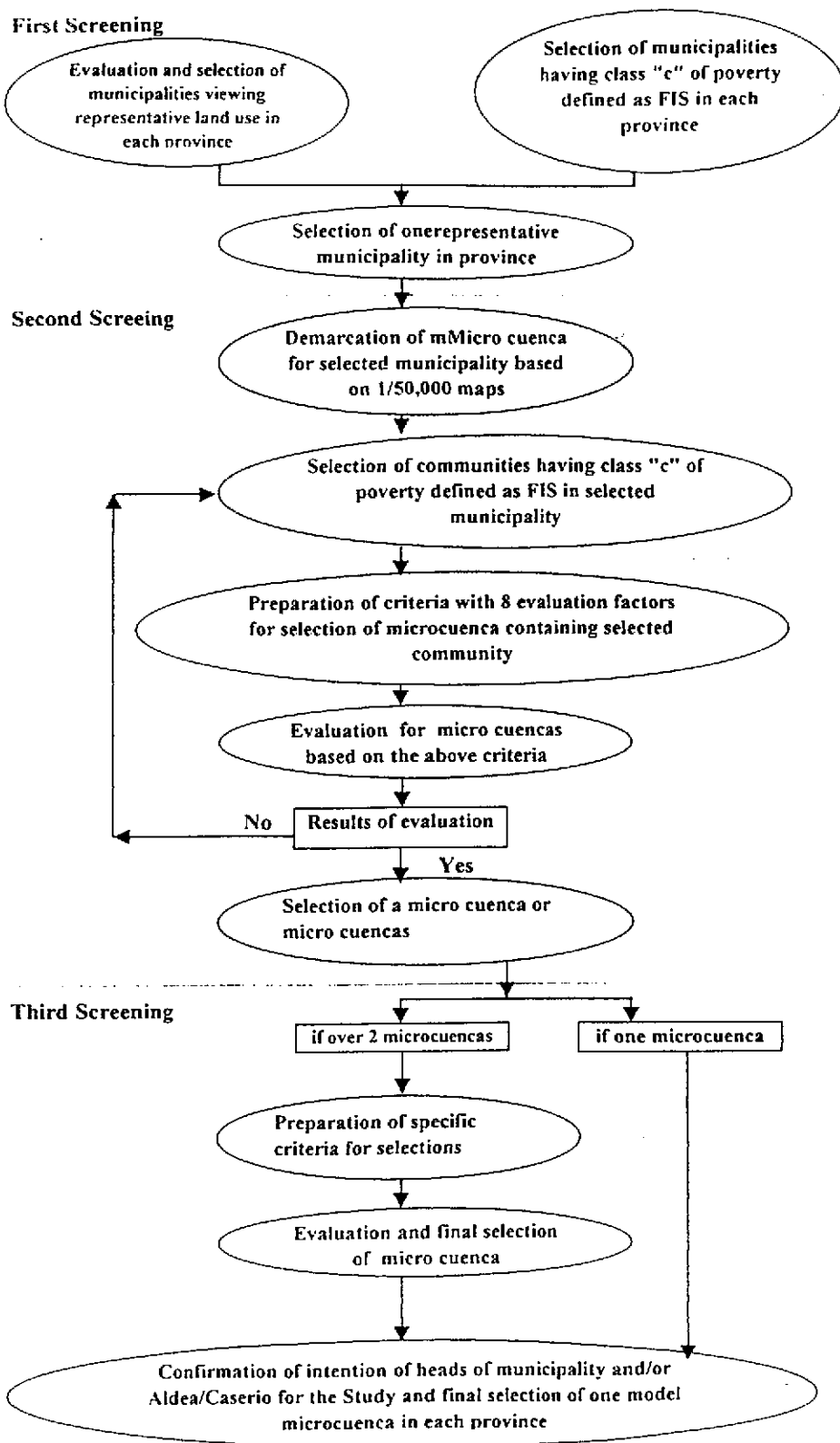


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Gráfica 3.5.2(1)

Mapa de Uso Actual de las Tierras del Departamento de Quetzaltenango

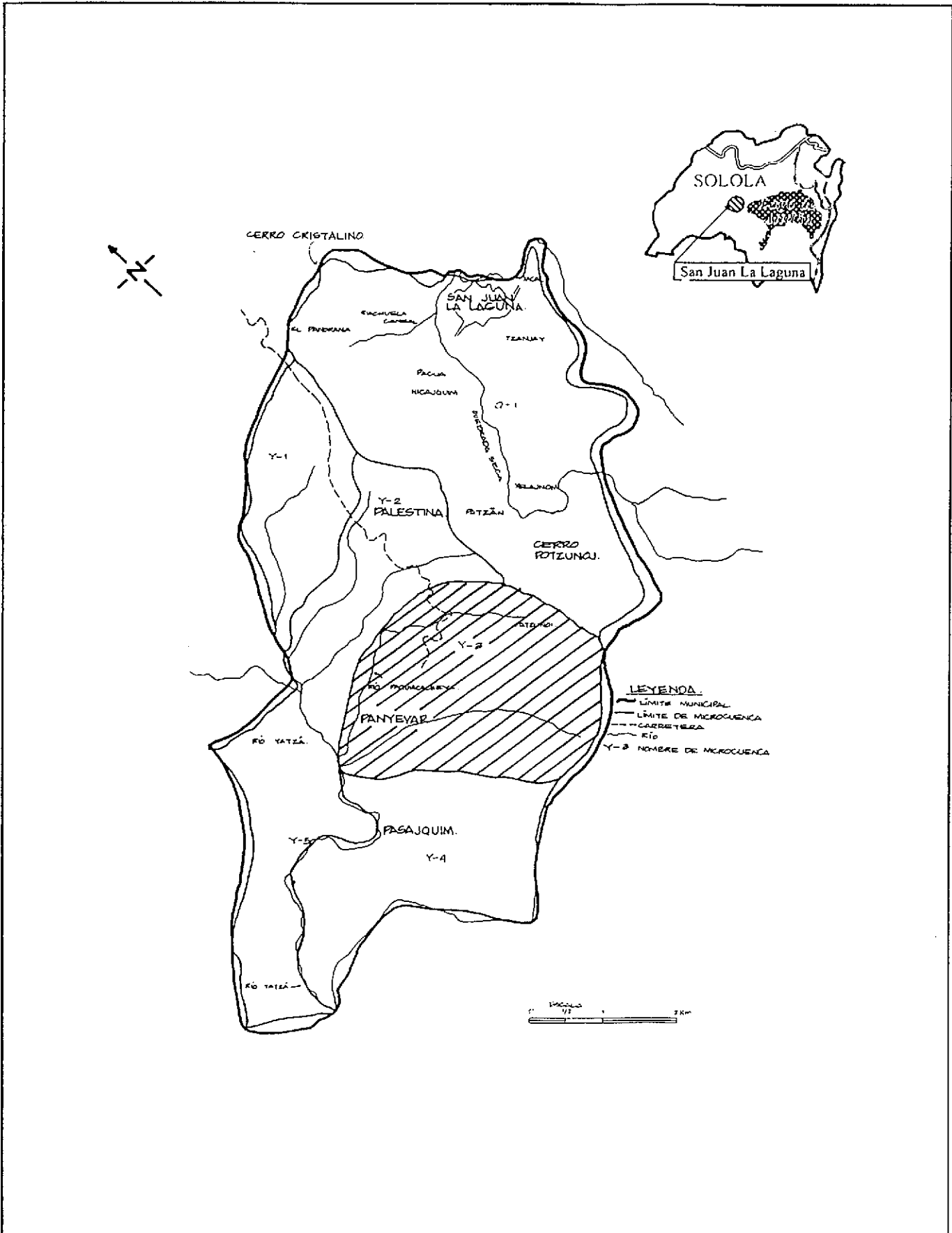


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Gráfica 4.1.1(1)

Flujograma para la Selección de Las Micro-cuencas Modelos

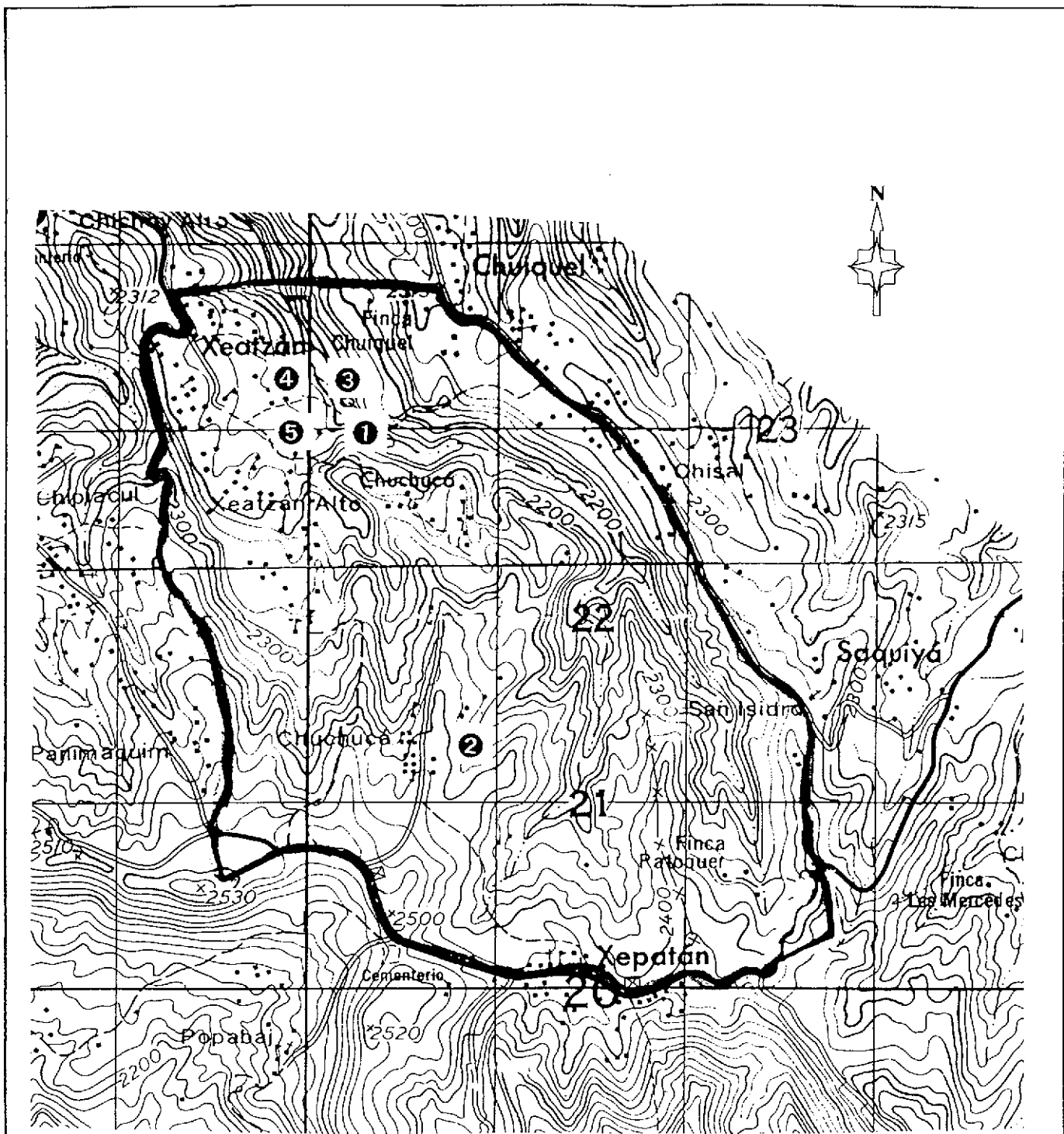


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Gráfica 4.2.2(1)

Micro-cuenclas del Municipio de San Juan la Laguna

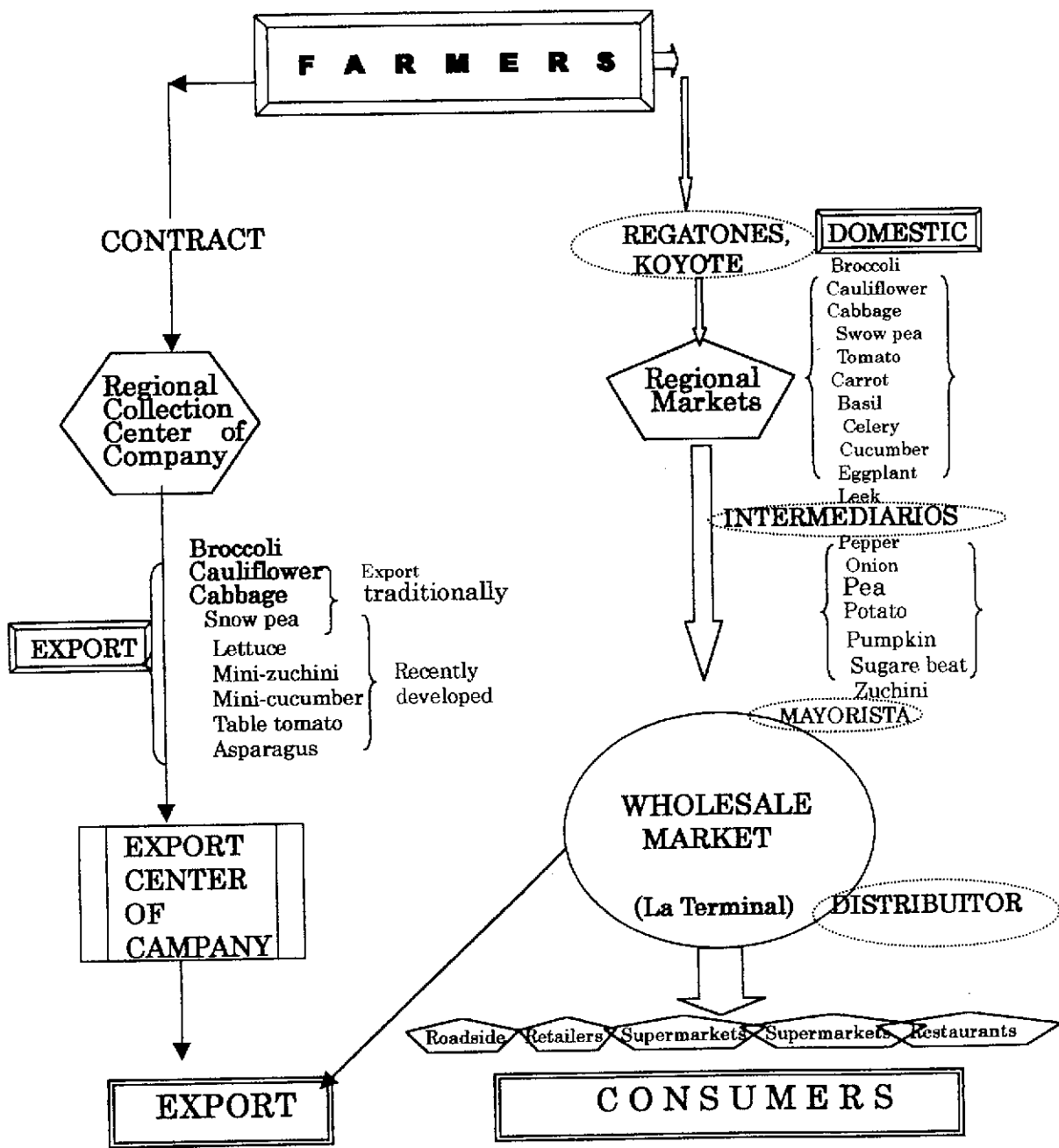


- Xeatzán Bajo**
- No. Spring
- ① Pachomochai
 - ② Chuchuca
 - ③ Chuacaaquix
 - ④ Chitiyah
 - ⑤ Pachor

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Gráfica 5.1.1(1)
Fuentes de Agua en Xeatzán Bajo,
Chimaltenango

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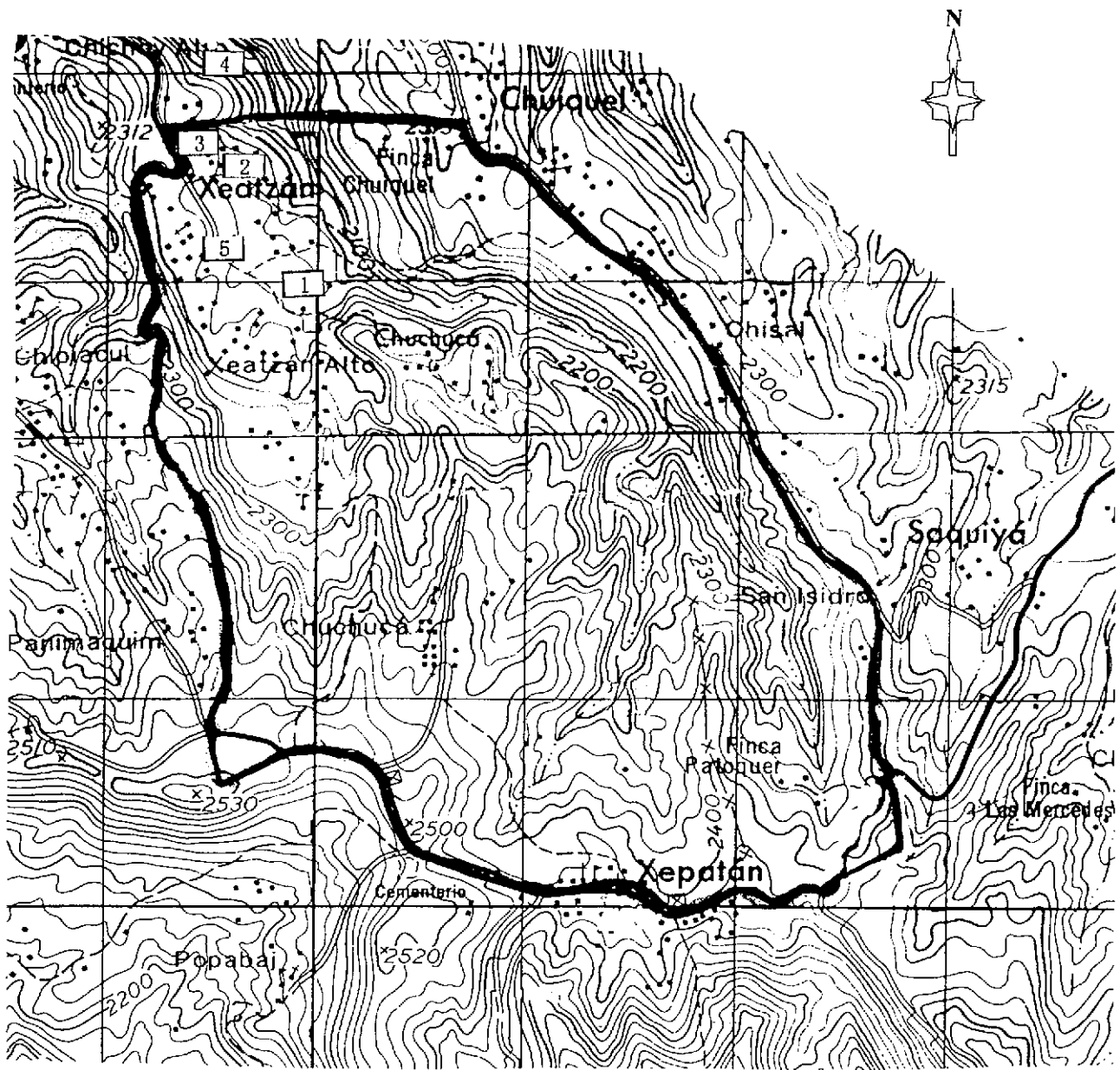


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Gráfica 5.1.3(1)

Canales de Comercialización de Hortalizas



Xeatzan Bajo

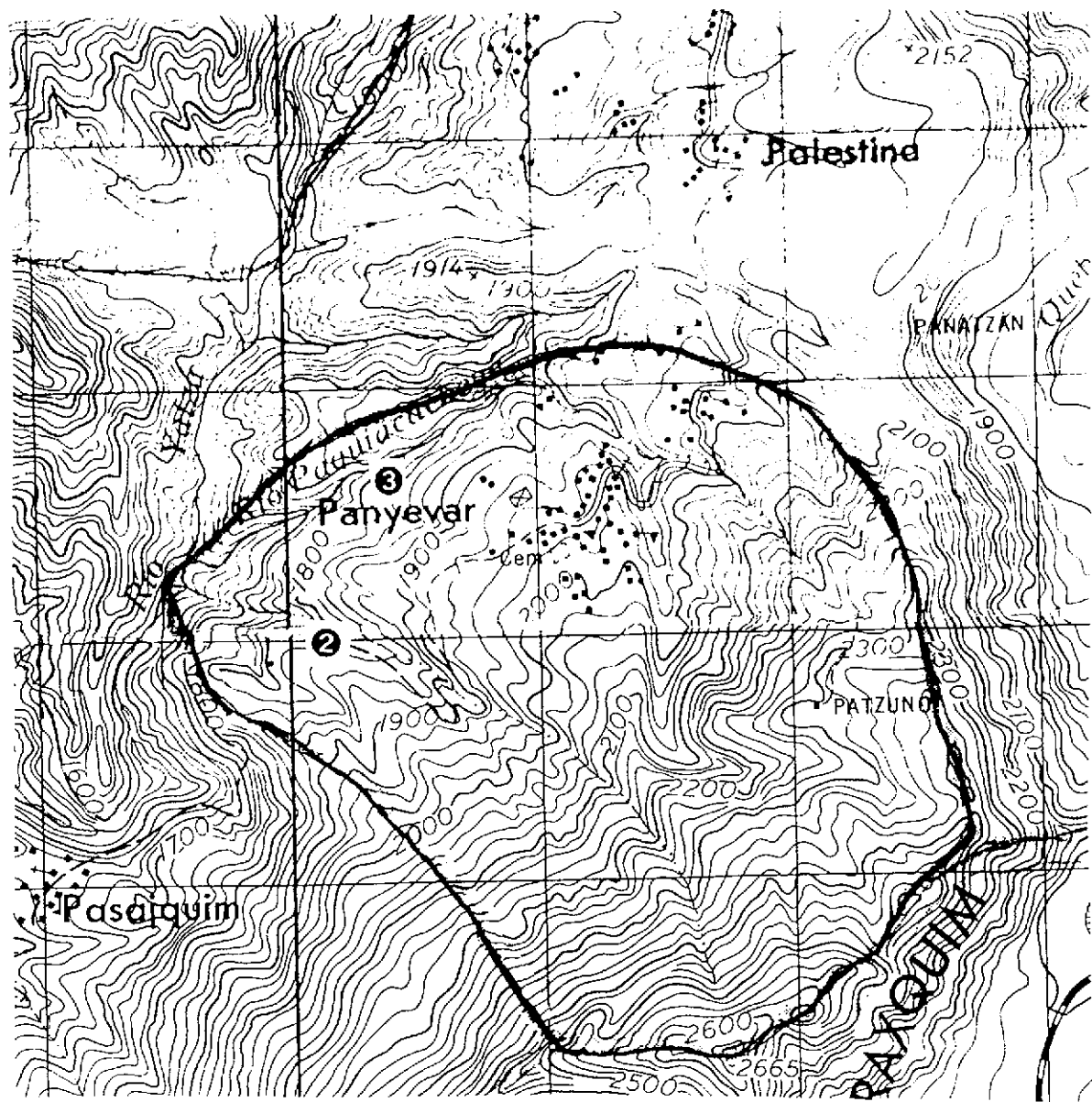
1	C-1	fountain
2	C-2	well
3	C-3	well
4	C-4	fountain
5	C-5	tap water

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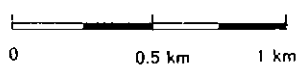
Japan International Cooperation Agency (JICA)

Gráfica 5.1.7(1)

**Puntos de Muestreo de Agua en Xeatzan Bajo,
Chimaltenango**



①



- Panyebar**
 No. Spring
 ① Panan
 ② Silberio
 ③ Juan

THE MASTER PLAN STUDY ON SUSTAINABLE RURAL
 DEVELOPMENT FOR THE REDUCTION OF POVERTY
 IN THE CENTRAL HIGHLAND REGION
 OF THE REPUBLIC OF GUATEMALA

Gráfica 5.2.1(1)
Fuentes de Agua en Panyebar, Sololá

Japan International Cooperation Agency (JICA)

Ripe Cherry

(moist. cont. 65~70%)

pulp	39%
mucilage	17
skin	7
bean	37

De-pulping

De-mucilage

Washing and Grading

Drying

PARCHMENT BEANS

----- **WET PROCESSING STAGE** -----

Final Processing

----- **DRY PROCESSING STAGE** -----

Packing and shipping

CLEAN COFFEE BEANS

{ moisture content: 11~12% }

- (A) Receiving beans within 24 hr after harvest:
 - (1) checking under-ripe, over ripe beans
 - (2) weighing
- (B) Dumping beans in receiving tank
 - (1) softening beans
 - (2) sorting by gravity
- (C) Pulping machines
 - (1) Removing pulp
 - (2) Removing mucilage
- (D) Passing into water channels
 - (1) Gravity selection
 - (2) Washing
- (E) Concrete drying yard
 - (1) drying, (2) cleaning

FARMERS

Coyote (small)

Coyote (big)

Pulper

Transportation

Brokers

Dry Processing

Brokers

Agro-Export Co

Domestic Suppliers

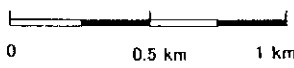
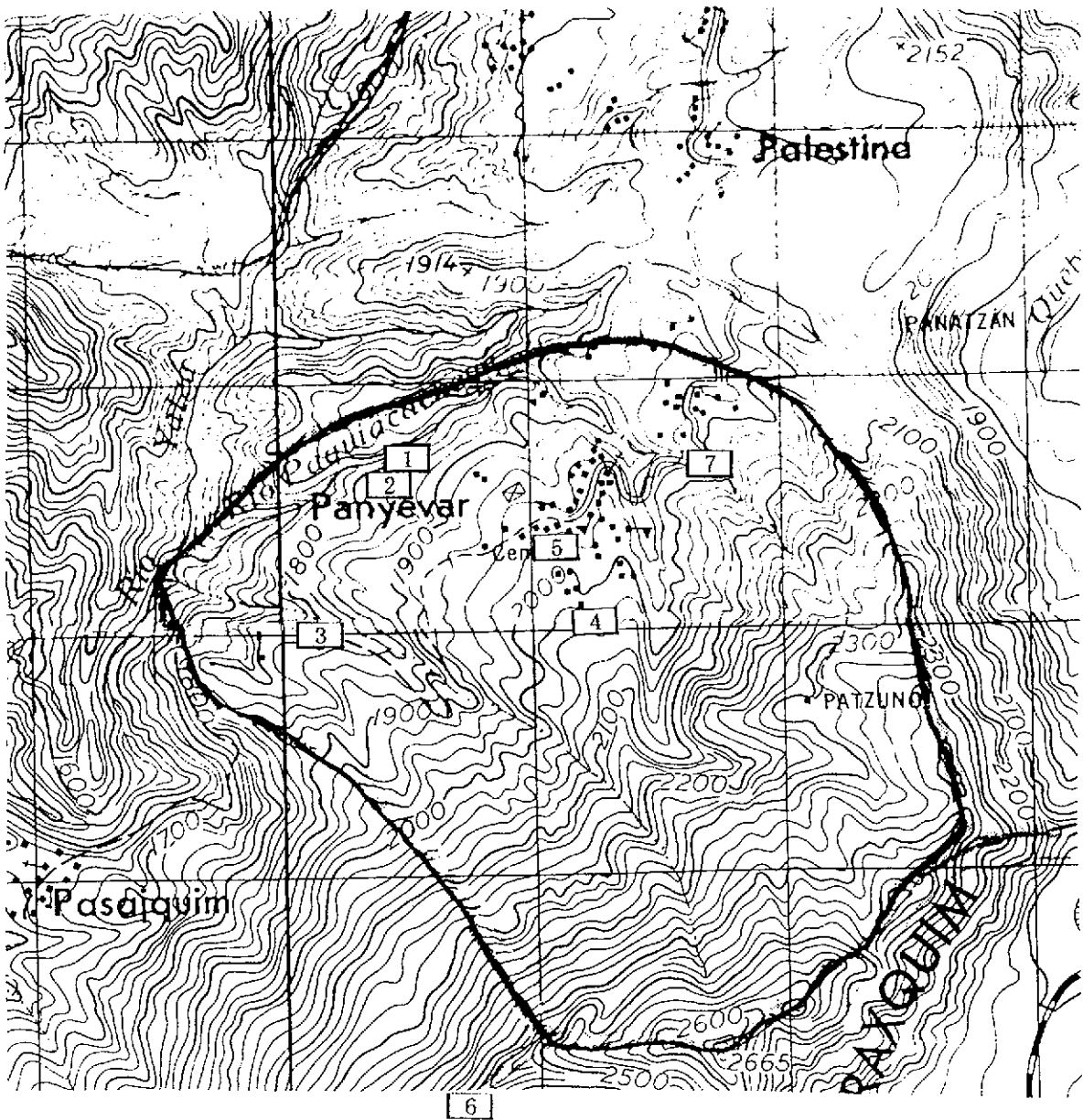
Consumers

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Gráfica 5.2.3(1)

Proceso de Beneficio del Café



Panyebar		
1	S-1	fountain
2	S-2	fountain
3	S-3	fountain
4	S-4	fountain
5	S-5	water tank
6	S-6	fountain
7	S-7	river

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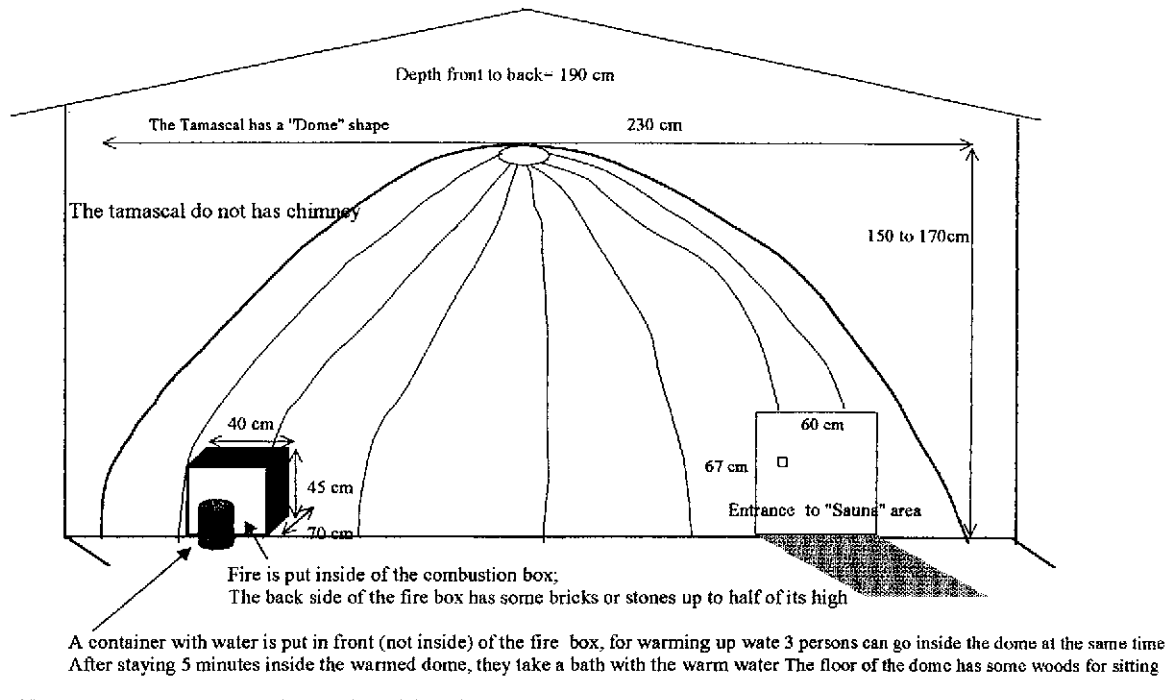
Gráfica 5.2.7(1)

Puntos de Muestreo de Agua en Panyebar, Sololá

Tamascal Type-1 : Tamascal in Pachum area

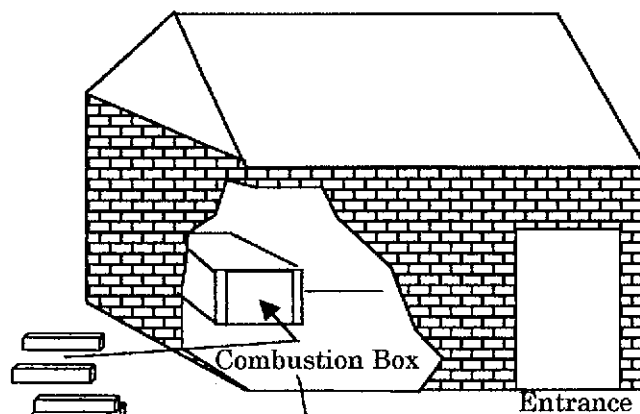
- 1) How to warm up inside de tamascal? They fire woods in the combustion box; Half of the back side is open to pass hot air to the Dome
- 2) The time required varies from 30 to 60 minutes, depending on the quality of wood.
- 3) Number of fire woods to be consumed is 15 to 20 pieces of about 50 cm long

They do not heat stones; just the direct heat from wood goes to the dome; Some of them spray water directly on top of fire to make vapor, but soon fire ends.



Tamascal Type-2 :Tamascal in other area, such as Palestina

Size : height 1.5m, width 2 m and 1.5m
made by concrete/clay blocks and clay

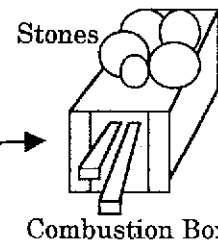


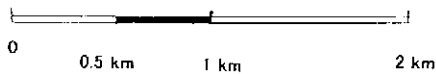
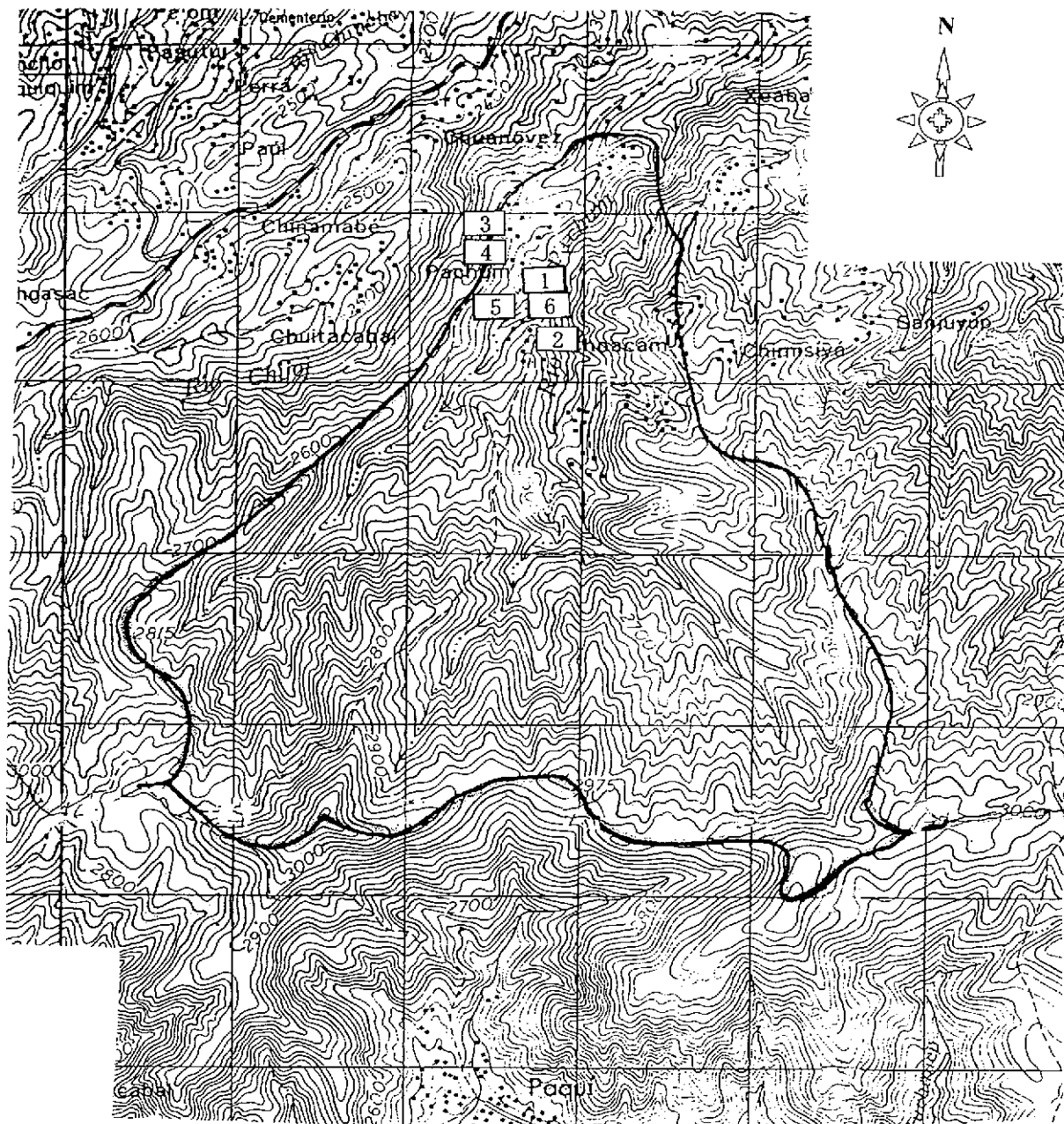
- Stones are heated on the combustion box
After heating stones they put water on them
to generate vapor.

- The box is located inside the room no any
ventilation but entrance space. Thus the
entrance should be opened during burning
to supply oxygen into the room. It makes
hot air go out from the room.

Firewood

Firewood to be consumed;
around 10-15 pieces for 1 hr preparation
Size is the same in the above.





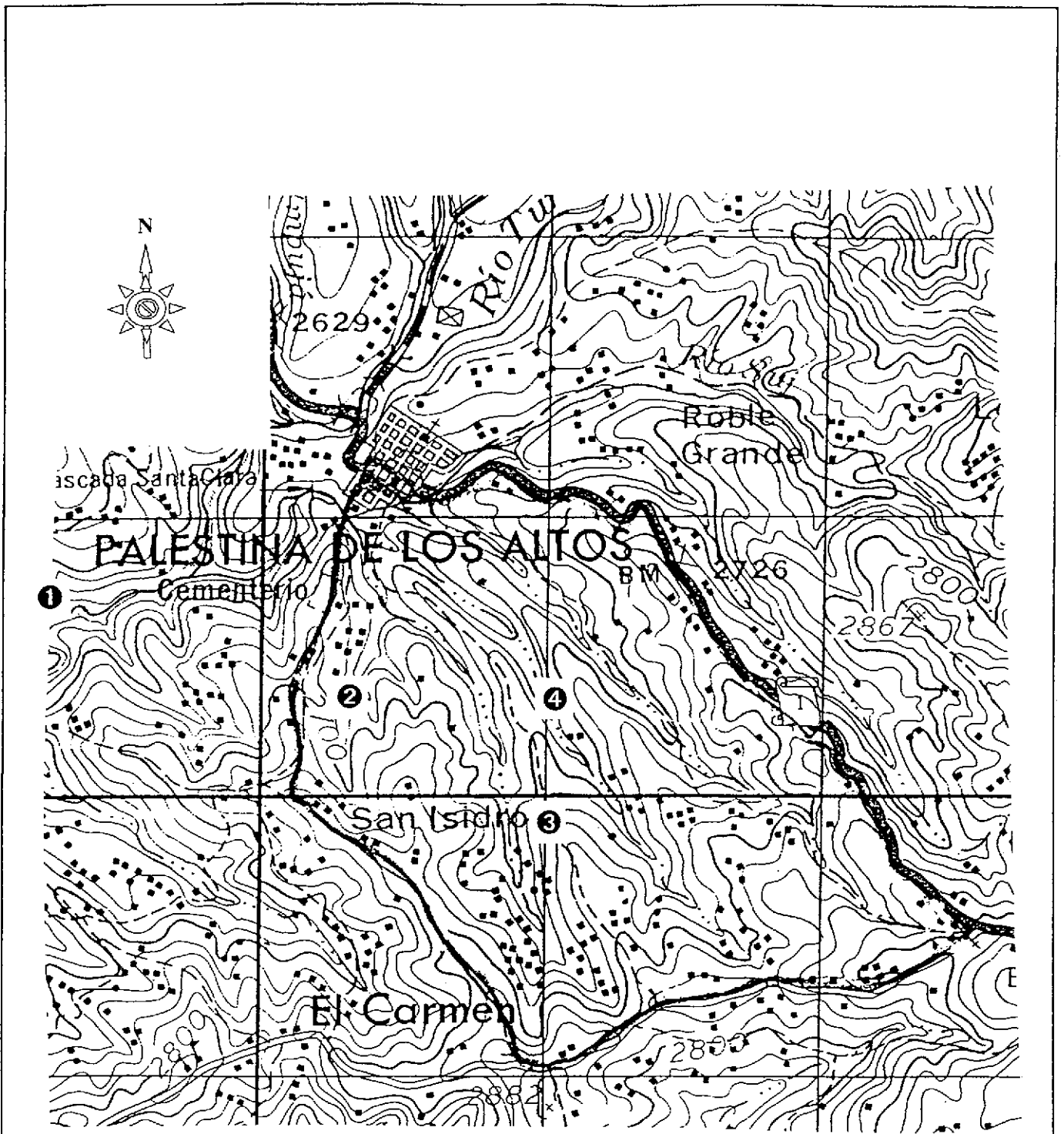
Pachum		
1	T-1	fountain
2	T-2	river
3	T-3	fountain
4	T-4	tap water
5	T-5	well
6	T-6	river

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Gráfica 5.3.7(1)

**Puntos de Muestreo de Agua en Pachum,
Totonicapán**



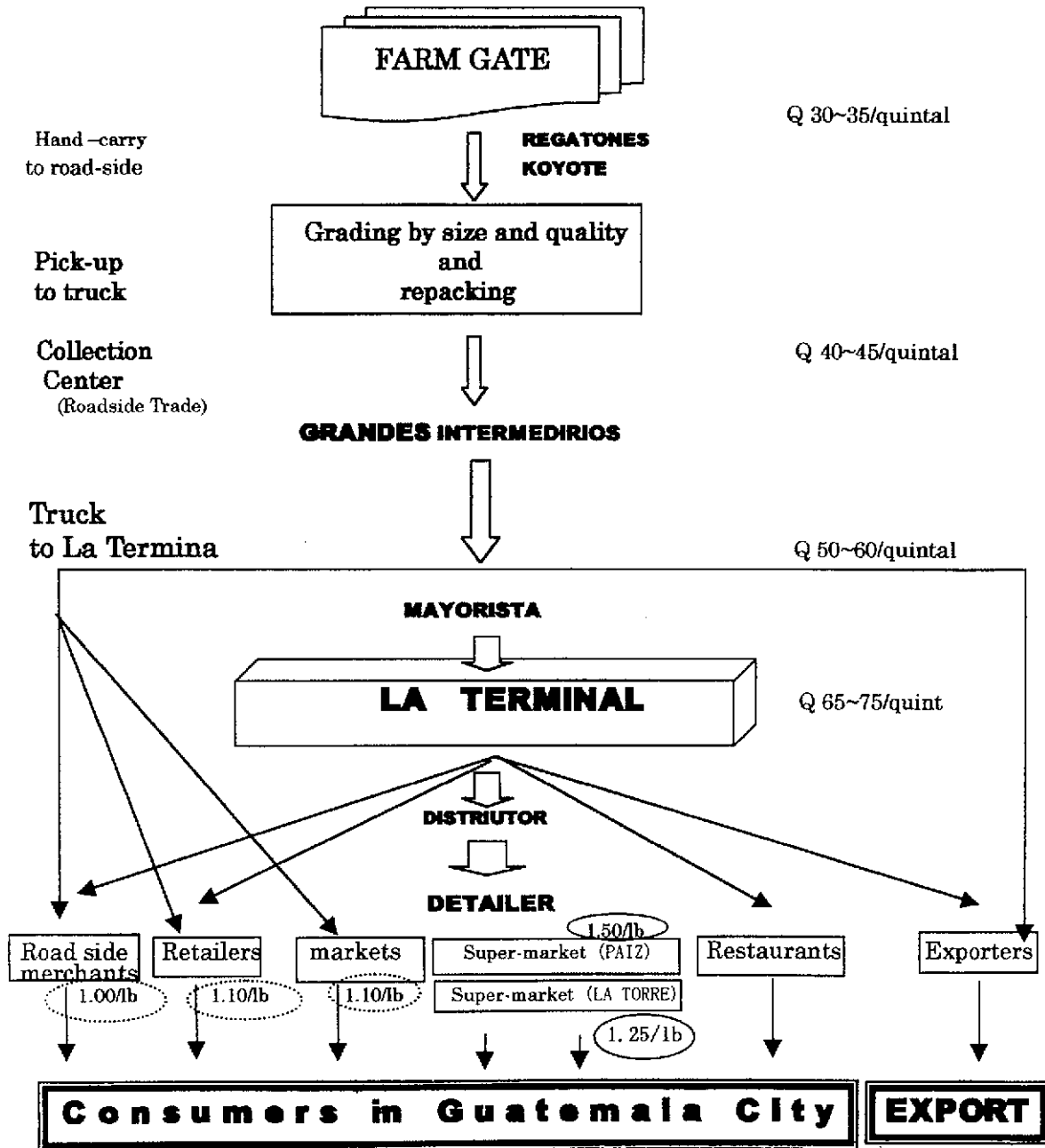
- Palestina**
- | | |
|-----|------------------|
| No. | Spring |
| ① | Los Morinos |
| ② | Berden Monteroso |
| ③ | Los Diaz |
| ④ | Sector I |

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Gráfica 5.4.1(1)
Fuentes de Agua en Palestina de los Altos, Quetzaltenango

PRODUCTION AREA : Quetzaltenango
 Palestina de Los Altos, Caserío Los Perez
 CONSUMPTION AREA : Guatemala City
 DATE : 16. August. 2000
 COMODITY : Loman, washed, mediana



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Gráfica 5.4.3(1)

Canales de Comercialización de Papa

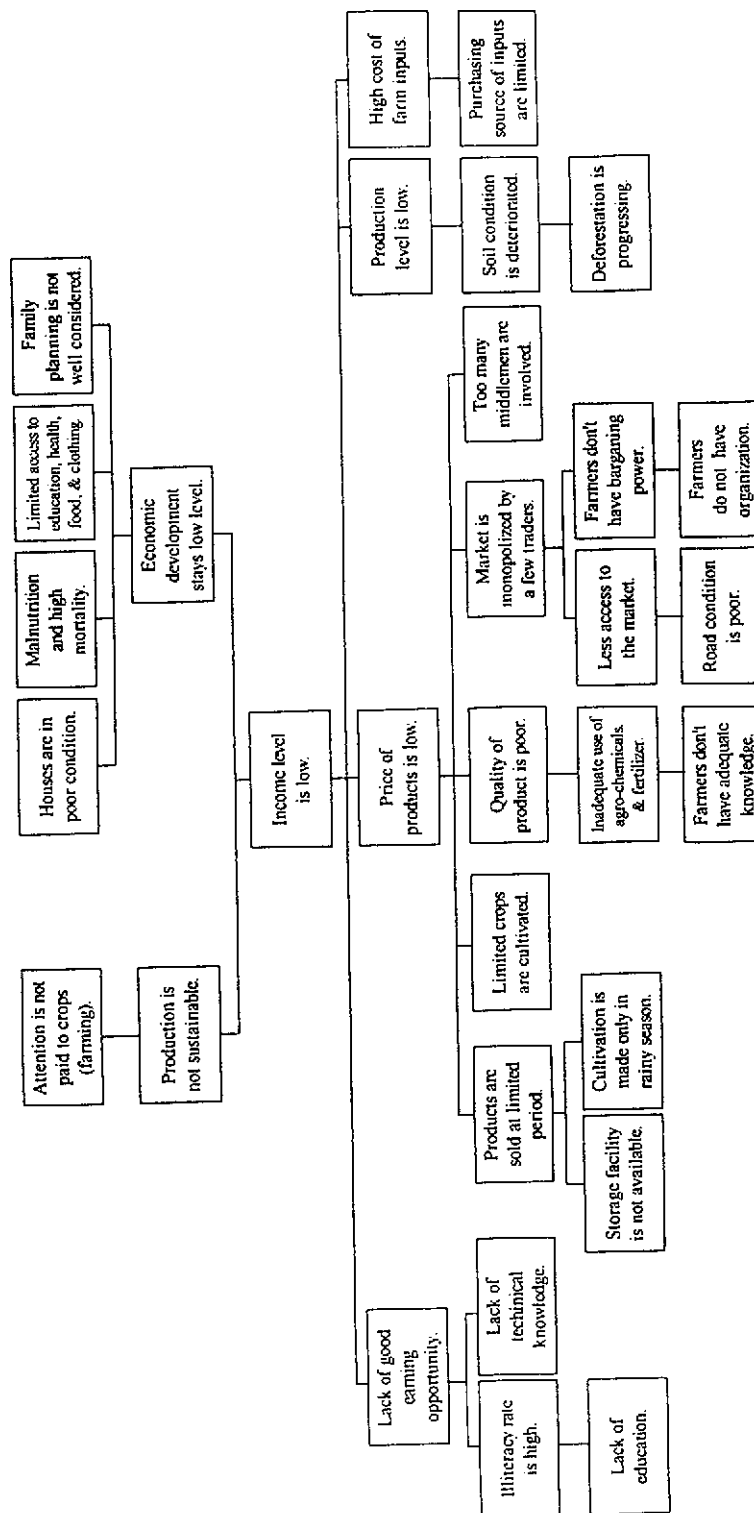


Palestina de Los Altos		
1	O-1	fountain
2	O-2	public tank
3	O-3	well
4	O-4	public tank
5	O-5	fountain
6	O-6	river
7	O-7	river

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Gráfica 5.4.7(1)
Puntos de Muestreo de Agua en Palestina, Quetzaltenango

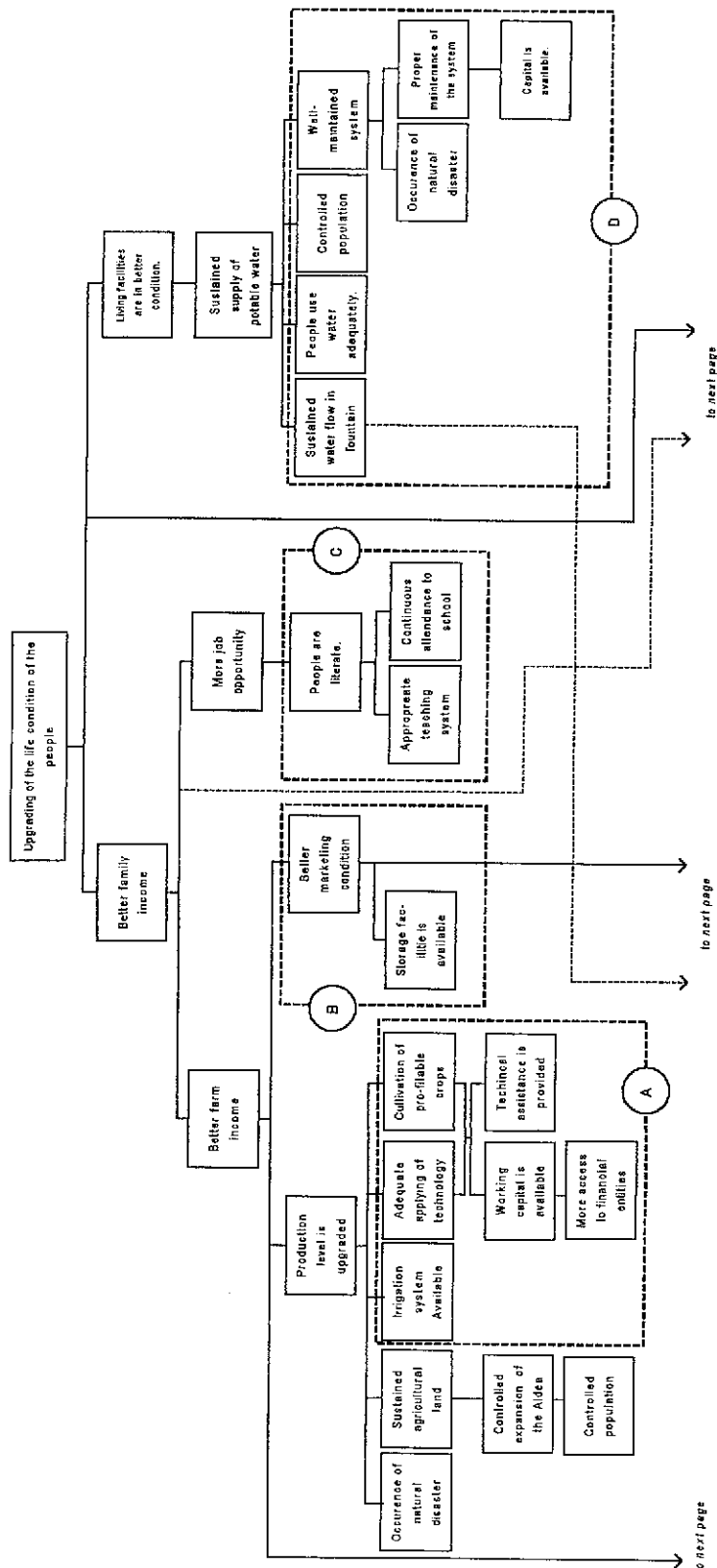


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Gráfica 6.4.1(1)

Arbol de problemas de Xeatzan Bajo



A. Agriculture Improvement Approach

- Credit assistance for agricultural activities
- Provision of technical assistance on production on coffee, vegetable.
- Implementation of mini-irrigation system

B. Market Improvement Approach

- Construction of storage

C. People Capacitation Approach

- Improvement of school facility and utilization of the facilities for children education and for training productive activities

D. Water Supply Improvement Approach

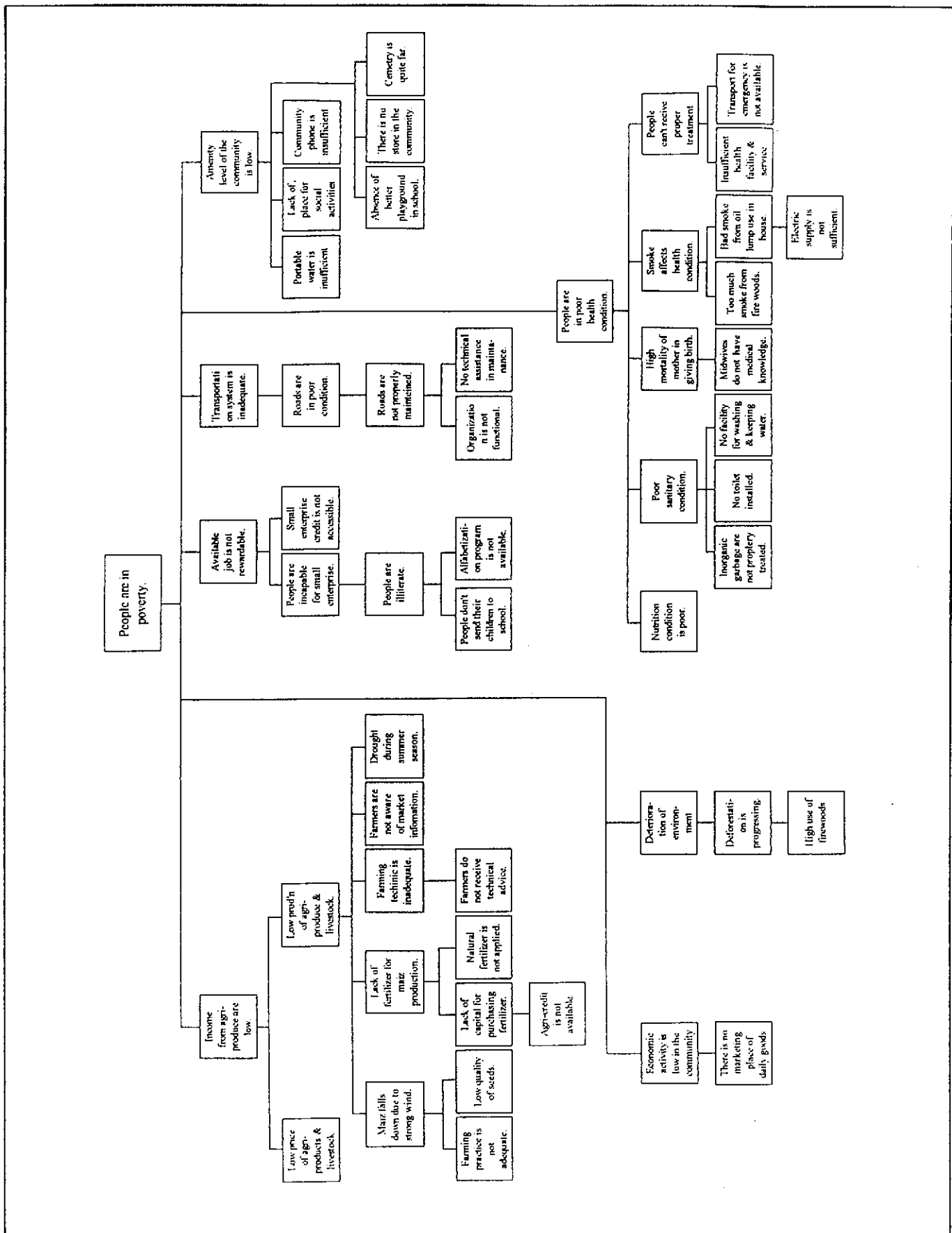
- Installation of Potable water supply system with the projection of 20 years projection of water consumption
- Protection of water source to maintain available water amount

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Gráfica 6.4.2(2)

Arbol de Objetivos con alternativas de desarrollo potenciales para Panyebar (1/2)

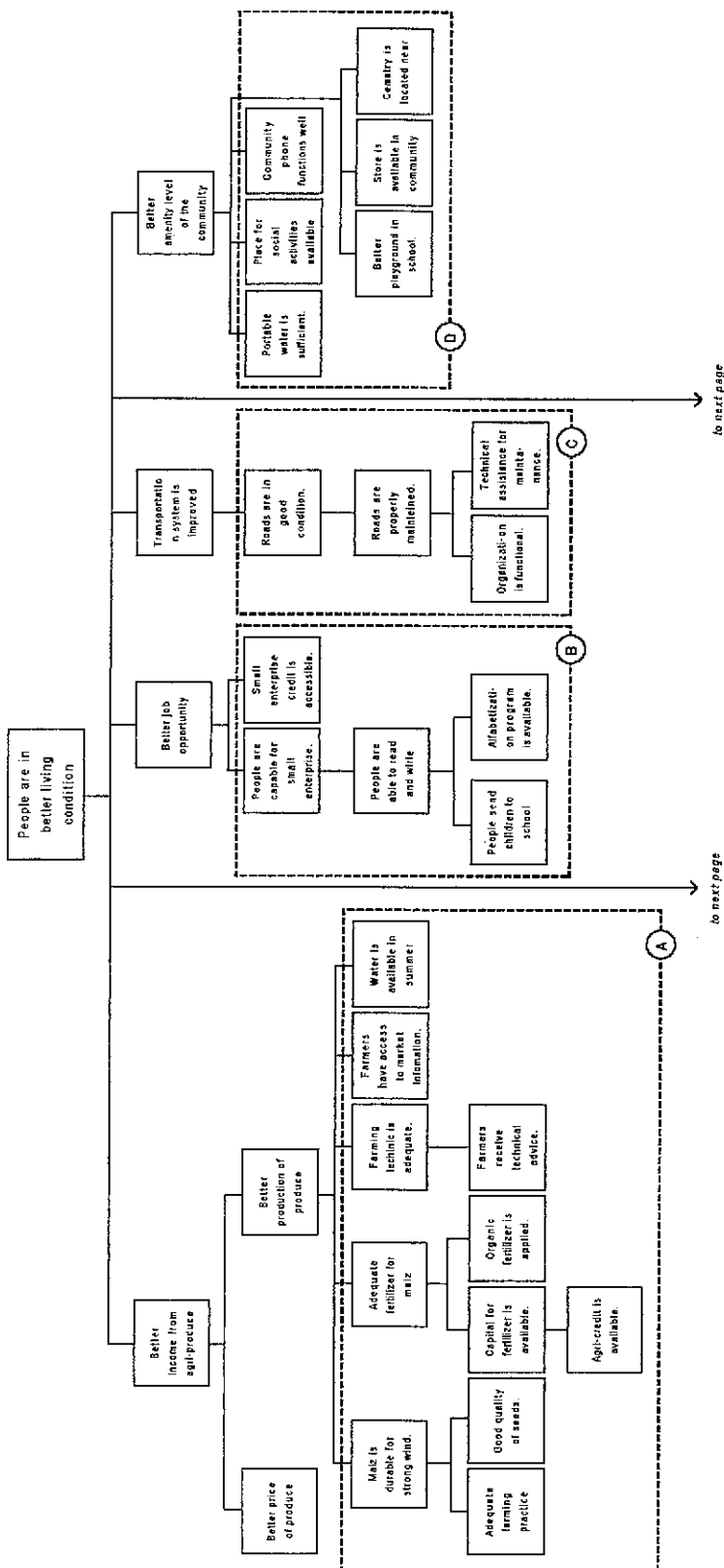


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Gráfica 6.4.3(1)

Arbol de Problemas de Pachum



D. Amenity Improvement Approach

- Improvement of tap water system
- Enhancement of electric service
- Diffusion of improved stove
- Improvement of school and housing
- Establishment of market in the community
- Establishment of cemetery

B. People Capacitation Approach

- Vocational training on non-agricultural activities (textile, carpenter, etc)
- Credit for commercialization of non-agricultural activities

C. Road Improvement Approach

- Improvement of road and maintenance

A. Agriculture Improvement Approach

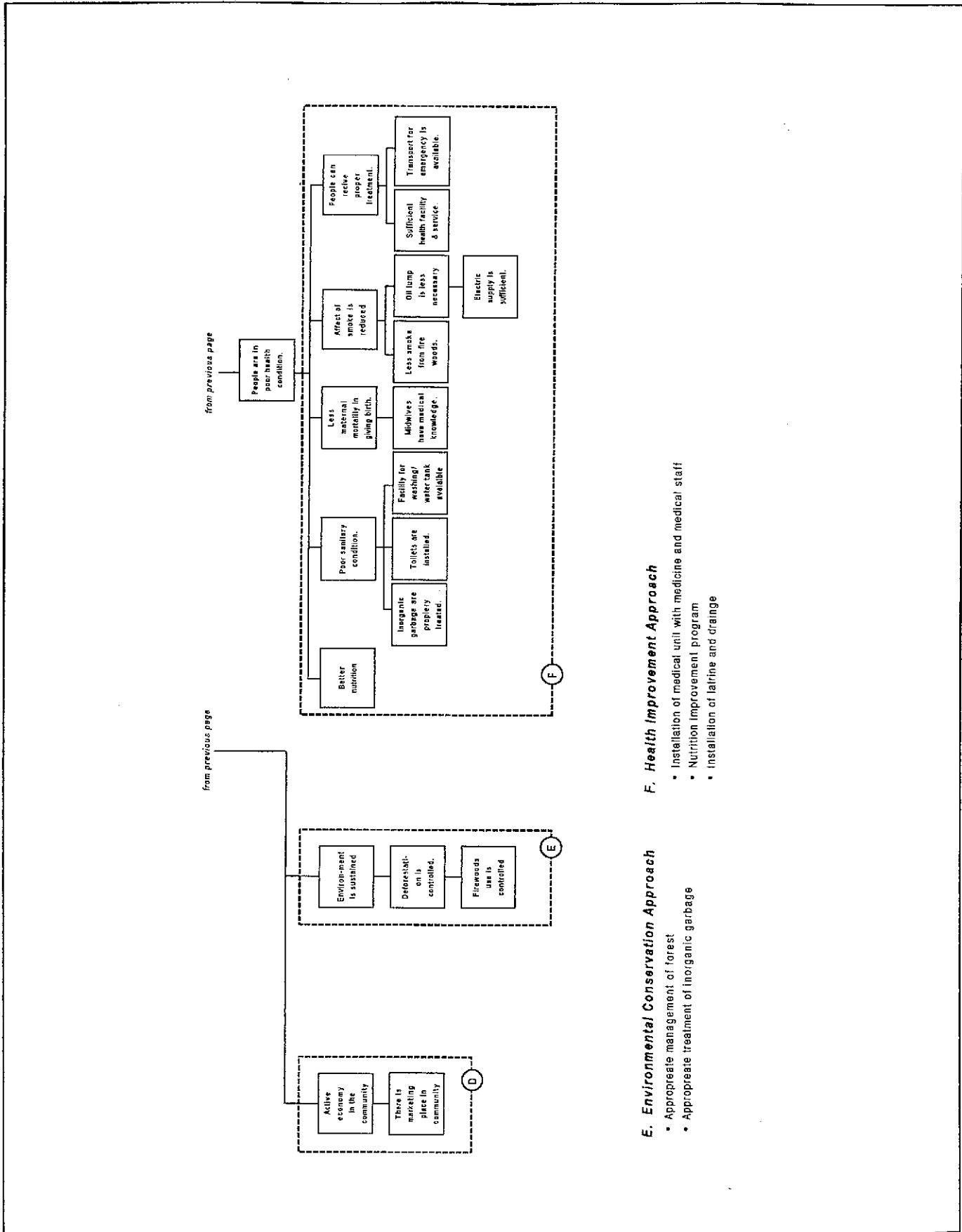
- Installation of mini-irrigation
- Technical assistance of agriculture
- Agricultural credit

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Gráfica 6.43(2)

Arbol de Objetivos con alternativas de desarrollo potenciales para Pachum (1/2)

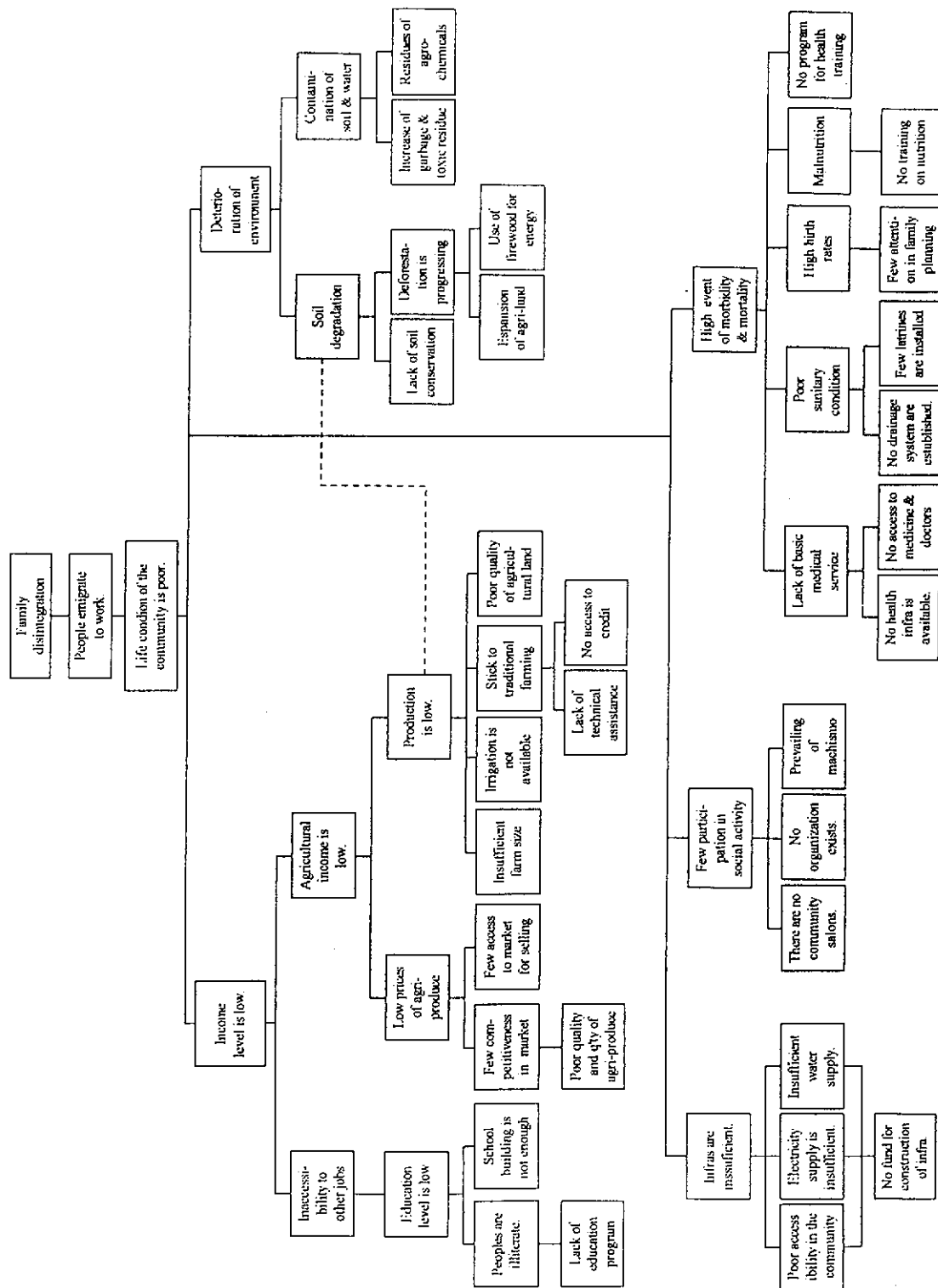


F. Health Improvement Approach

- Installation of medical unit with medicine and medical staff
- Nutrition improvement program
- Installation of latrine and drainage

E. Environmental Conservation Approach

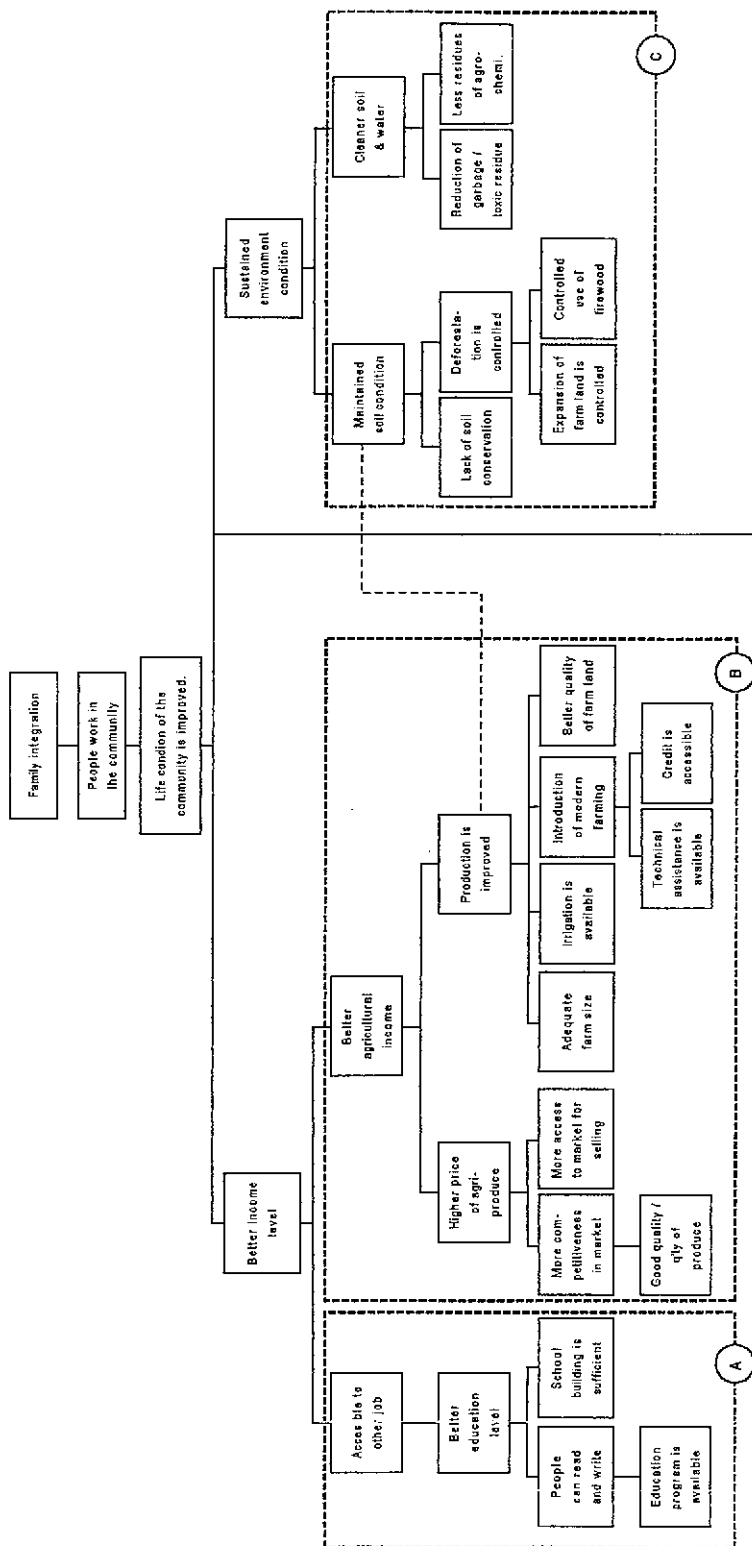
- Appropriate management of forest
- Appropriate treatment of inorganic garbage



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Gráfica 6.4.4(1)
Arbol de Problemas para Palestina de Los Altos



to next page

C. Environment Conservation Approach

- Management of forest conservation
- Reforestation
- Management of soil conservation
- Management of agro-chemicals

B. Agriculture Improvement Approach

- Technical assistance for agriculture
- Introduction of improved seeds
- Provision of agricultural credit
- Promotion of commercialization of produce
- Installation of mini-irrigation system

A. People Capacitation Approach

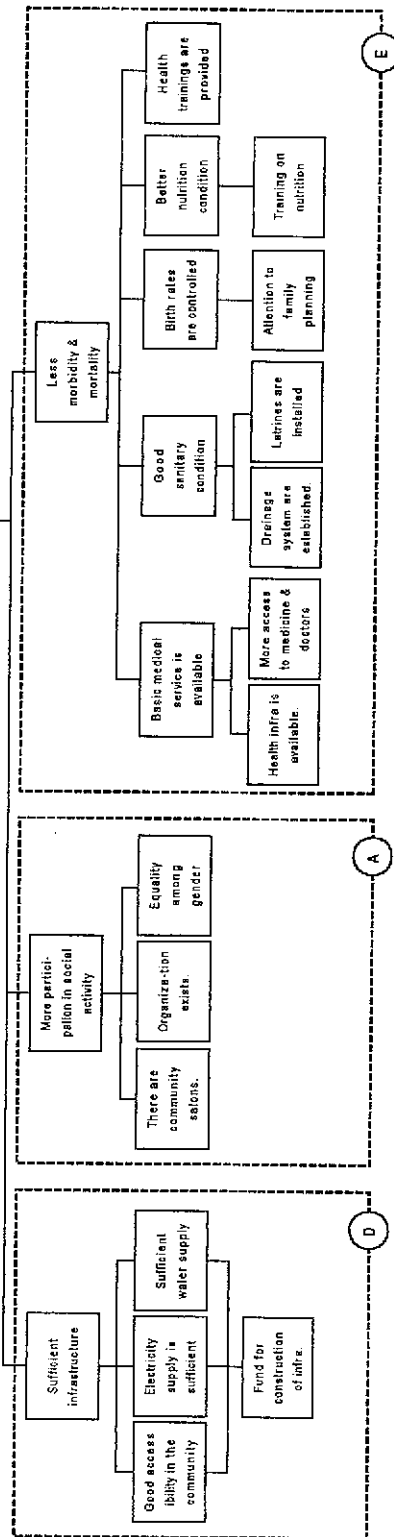
- Strengthening of community organization
- Implementation of training of productive activities
- Implementation of education program

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Gráfica 6.4.4(2)
Arbol de Objetivos alternativas de desarrollo potenciales para Palestina de los Altos (1/2)

from previous page



D. Infrastructure Improvement Approach

- Rehabilitation of water tank for washing
- Asphalt paving of road
- Enhancement of potable water supply system
- Constructin oldrainage
- Enlargement of school facility

E. Health Improvement Approach

- Construction of health post
- Implementation of health education program
- Disposition of medical staff and medicine
- Establishment of communal pharmacy
- Establishment of medical unit

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Gráfica 6.4.4(2)

Arbol de Objetivos alternativas de desarrollo potenciales para Palestina de Los Altos (2/2)