1.4. Feasibility Assessment of the Pilot Project in Las Verapaces PTDA

1.4.1. Existing and Projected Socio-economic & Regional Development Frameworks

The two Departments of Alta and Baja Verapaz (in the following Las Verapaces) have an estimated population size of some 1,017,732 people[27] (year 2000, about 8.9 percent of Guatemala's total population size in that very year). The population density in Alta Verapaz is with 737 people/km2 and in Baja Verapaz with 759 people/km2 quite high in comparison with other Departments in Guatemala[28].

The combined absolute population size of Las Verapaces according to the 1981 and 1994 population census data was 437,610 and 699,257 people, respectively[29]. Hence, the gross population growth rate is 3.67 percent over the period 1981 to 1994, and 6.46 percent over the six-year period 1994 to 2000. The implied long-term 1981 to 2000 population growth rate is with 4.54 percent well above the national average of 3.4 percent, indicating that the Las Verapaces Departments are clearly a net in-migration area, mainly into Baja Verapaz.

1994 population census results allow for the identification of the then prevailing urban/rural split, as well as the ethnic composition of the population base. These data suggest that the Las Verapaces were a predominantly rural Department (Alta Verapaz 84.2 per cent of the population and Baja Verapaz about 79.5 per cent of the 1994 population) mainly comprising an indigenous population (Alta Verapaz 89.0 percent indigenous; Baja Verapaz about 55.5 per cent indigenous)[30].

Alta Verapaz had in the year 2000 some 15 and Baja Verapaz some 8 municipalities. The largest municipalities in Alta Verapaz are San Pedro Carchá (159,574 urban dwellers) and Cobán (156,086 urban dwellers). The largest municipality in Baja Verapaz is Salamá with about 49,089 urban dwellers. The urban structure in both Departments combined is characterized and dominated by 17 municipalities in the "10,000 to 50,000" population size category[31]. One municipality[32] in Baja Verapaz falls into the "below 10,000" inhabitants category. An urbanization rate cannot, at this point in time, be indicated, due to a lack of time-series on the Department's rural/urban split.

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[27] Estimated and enumerated by the national statistical institute, INE. Please consult with Appendix 1 for more details.

[28] This part deals only with the numerical frameworks needed to undertake the feasibility study. All other aspects, such as physical environment and so on, have been presented and discussed in Interim Report 1. They do not need to be repeated here.

[29] Please consult with Appendices.

[30] Please consult with Appendices.

[31] Please consult with Appendices.

[32] The municipality is El Chol.

The two Las Verapaces Departments are identical with Guatemala's "Development Region II (North)". Detailed reliable past performance gross regional domestic product (GRDP) data have not been made available. However, using a "cross-referencing" approach and common sense allow for tentative, but not conclusive general observations on most likely past trends in GRDP structure and development. The population size in the "work-age" bracket of 15 to 64 years is estimated by the national statistical institute INE at some 735,821 people, equivalent to 72.3 percent of the absolute population size in the year 2000[33]. Formal sector employment is derived at by using a 35 percent participation rate. That results in some 305,320 formal sector employees in the year 2000, or about 41.5 percent of the working-age population size.

The distribution of formal sector employment over major economic sectors is estimated at 88.7 percent for agriculture (equivalent to 270,698 people); 1.9 percent in industry (equivalent to around 5,923 people) 1.7 percent in the construction sub-sector (equivalent to about 5,251 people); 2.6 percent in the trade sub-sector (equivalent to about 8,061 people); 2.6 percent in the services sub-sector (equivalent to about 8,060 people); 1.8 percent in public administration (about 5,373people), and 0.6 percent (about 1,954 people) for which the formal economic sector cannot be identified.

Implied "open unemployment" is estimated at 13,131 people (around 2.6 percent of the working age population); implied "open under-employment" is estimated at 128,768 people (around 17.5 percent of the working age population), and the implied "informal sector labor force" is therefore estimated at around 282,601 persons, or around 38.4 percent of the working age population size.

It is possible to roughly calculate from such data a static picture for the GRDP of Las Verapaces in the year 2000 GRDP, including the implied GRDP's structural composition. The values are derived at by applying national average sector-labor productivity data to the estimated formal sector employment data, as well as average national level productivity data. Table 1.30 presents the results of that approach for the GRDP estimation in 1958 constant Quetzales and Table 1.31 for a likely structural composition of Las Verapaces GRDP in the year 2000.

Table 1.30 Rough estimation for Las Verapaces GRDP size in 2000

Parameter	*Based on Sub-sector* Labor Productivity (2)	*Based on National Average* Labor Productivity (3)
Absolute GRDP Size	314.6	431.4
Share in GDP	*6.50%*	*8.90%*

Note: Unit: Million Quetzales/Percent
Source: JICA Study Team.

Hence, the Departments Las Verapaces, which account for roughly 8.9 percent of the total labor force in the formal sector accounted in the year 2000 for between 6.5 per cent to 8.9 per cent of total national level GDP (measured in constant 1958 Quetzales prices) and covering the formal sector of the economy only.

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[33] Please consult with Appendices.

Table 1.31 Rough estimation for Las Verapaces GRDP structure in 2000

At National Level			At Las Verapaces Level		
Parameter	% of Labor Force	% of GDP	Parameter	% of Labor Force	% of GRDP
Primary Sector	58.1	23.1	Primary Sector	88.7	48.4
Secondary Sector	17.7	20.3	Secondary Sector	3.7	4.0
Tertiary Sector	24.2	56.6	Tertiary Sector	7.6	47.6
Total	100.0	100.0	Total	100.0	100.0

Note: Unit: percent of total
1) The sector definition is according to United Nations standard classification.
2) Public Administration is included under the tertiary sector.

Source: JICA Study Team.

Though the above data have to be interpreted with caution, due to the approach employed in estimating the departmental level data, the following features appear to be quite characteristic:

- The relationship between labor force employed and share of output produced in the primary sectors hints at the quite low level in terms of efficiency, size and technology employed in Las Verapaces primary sector. Some 89 percent of the Department's labor force produces only about 48 percent of GRDP, where some 58 percent of total national level labor force produce some 23 percent of GDP, and
- The tertiary sector, which comprises all services, including tourism and tourism related economic activities, produces with only 7.6 percent of the labor force some 48 percent of GRDP. It is therefore fair to state that the tertiary sector, including tourism and tourism related service activities, are quite important for Las Verapaces in terms of overall gross output.

It is not recommendable for projecting Las Verapaces socio-economic framework to use a "one point-in-time" related projection approach, given the high uncertainty level in past regional & local level empirical socio-economic data. As a consequence, a scenario approach is adopted to project trend corridors for the socio-economic fundamentals of absolute population size; formal sector employment, GRDP and per capita income in current Quetzales.

Three scenarios are defined, namely a "linear past trend scenario"; a "low-end" as well as a "high-end" scenario. The fundamental underlying assumptions for the three scenarios are summarized in Table 1.32. Table 1.33 provides the numerical results of the major socio-economic parameter projected up to the planning horizon of 2020. It should be kept generally in mind that, though clearly an in-migration and predominantly rural area over the past 20 years, the economic base of the Departments Las Verapaces is predominantly agricultural-based and it may be at a relatively early stage of development in terms of labor force availability and its skill level composition, economic structure, scope and depth of such structure, and modern sector enterprise-base.

The number of informal sector and formal sector SME's could not be established with certainty.

Table 1.32 Assumptions for scenario formulation to project socio-economic fundamentals of Las Verapaces 2000 to 2020

Low-end Scenario	Linear Past Trend Scenario	High-end Scenario
Qualitative assumptions	Qualitative assumptions	Qualitative assumptions
1) Political & economic instability	1) Past trends & interrelationships continue over the coming 20 years	1) Growth in the national, regional and global economy accelerates
2) Private sector investment stagnates	2) Socio-economic fundamentals remain at similar levels	2) Domestic and foreign direct investment picks up & consumer confidence is restored
3) No focused development efforts at national & regional levels	3) The tourism sector remains at the same level in terms of "scope" & "depth"	3) Tourism development is guided by coordinated and targeted resource allocation (public & private)
4) Tourism sector remains fragmented and negatively effected by down- turn in visitor arrivals		
Basic numerical assumptions	Basic numerical assumptions	Basic numerical assumptions
1) Population size growth: 3.38%	1) Population size growth: 6.45%	1) Population size growth: 4.00%
2) Real GRDP Growth: 1.7%	2) Real GRDP Growth: 3.7%	2) Real GRDP Growth: 6.5%
3) Inflation rate: 6.0%	3) Inflation rate: 7.0%	3) Inflation rate: 5.0%

Source: JICA Study Team.

Table 1.33 Projection of major socio-economic parameter for Las Verapaces 2000 to 2020

Main Socio-economic Parameter	Year	Low-end Scenario	Linear Past Trend Scenario	High-end Scenario
Absolute population size	2000	1,017,732	1,017,732	1,017,732
(Number of people)	2010	1,419,053	1,901,473	1,506,492
	2020	1,978,627	3,552,604	2,229,976
Formal sector employment	2000	305,320	305,320	305,320
(Number of people)	2010	496,669	665,516	527,272
	2020	692,519	1,243,411	780,492
GRDP (current prices)	2000	13,038	13,038	13,038
(Million Quetzales)	2010	27,375	36,032	38,722
	2020	57,479	99,578	115,002
Current price per capita income	2000	12,811	12,811	12,811
	2010	19,291	18,950	25,703
(Quetzales)	2020	29,050	28,030	51,571

Note: Unit: as indicated

Source: JICA Study Team.

1.4.2. Las Verapaces PTDA Projected Tourism Development Direction

Volume 2 elaborates in detail on the regional development direction of Las Verapaces and there is no need to repeat this discussion here[34] in detail, except to highlight that the existing development plans (SCEP, CODEDUR and GTZ 1999 for Alta Verapaz; and SEGEPLAN and GTZ 1994 for Baja Verapaz) are rather general thereby making it difficult to operationalize individual objectives and numerical development targets. Also, eco-tourism was identified for Baja Verapaz as one of the potential areas for promoting economic development.

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[34] Please refer to Volume 2 for details.

The Las Verapaces Departments have some 40 important tourism resources (23 in Alta Verapaz and 17 in Baja Verapaz), the major number of which are nature-based resources. The major tourism development issues and the basic tourism development strategy as identified in the tourism development plan are summarized in Table 1.34 and the general tourism structure is identified in Table 1.35.

Table 1.34 Major tourism development issues and development strategy for Las Verapaces

Tourism Development Issues	*Tourism Development Strategy*
1) Nature-tourism related accommodation supply is insufficient	1) Consolidation of existing nature areas
2) Lack of human resources to develop nature-based tourism	2) Introduction of agro-tourism
3) Potential nature-tourism areas are located in remote areas	3) Revitalization of cultural traditions through tourism
4) Cobán City lacks tourism attractions and visitor facilities	4) Improvement of existing tourism products
5) Poor awareness in international tourism market of Guatemala as nature-tourism destination	5) Strengthening of tourism network

Note: The numbering does not imply a ranking of priority.
Source: JICA Study Team.

Table 1.35 Directions for spatial tourism structure development

Tourism Structure	Existing Structural Features	Additional/Future Structural Features	
		Short-term	Long-term
Tourism Center	Cobán		
Tourism Sub-center	None	Salamá	
Major Tourism Area	Cobán & surrounding areas Biotop Mario Dary Rivera	San Cristobal Verapaz Lanquin & Semuc Champey	Salamá & surrounding areas Laguna Lachua Chilasco
Major Tour Route	Cobán & surrounding areas	Coban - San Cristobal Verapaz Coban - Lanquin Area Coban - Canderaria	Coban - Salama – Salama Valley - Guatemala Coban - Laguna Lachua
Reginal Linkage	None	Coban - Sayaxche - Flores Cobán - Ixil Triangle - Huehuetenango	Coban - Tactic - El Estor - Rio Dulce

Source: JICA Study Team.

1.4.3. Las Verapaces PTDA Supporting Infrastructure Development and Public Sector Projects

The Ministry of Communications, Infrastructure and Housing implements currently two road up-grading projects, namely for the sections between San Cristóbal Verapaz and Huehuetenango and for the section between Cobán and Chinaja. These two projects could enhance the possibility of forming tourism corridors of Antigua-Cobán-Petén and Huehuetenango-Cobán-Rio Dulce.

The public investment process works the same as is described for the Department Petén. However, no list of the public investment projects during FY 2001 has been made available.

1.4.4. Las Verapaces PTDA Tourism Development Support Measures 2000 to 2020 and Short-term Projects

Tourism development support measures are divided in the tourism development plan into two rough groups, those recommended for implementation before 2010 (short-term), and those that should be implemented between 2010 and 2020. There are 3 pilot, 5 short-term and some five long-term development projects and measures[35] that are in line with the tourism development strategy for Las Verapaces PTDA. The pilot project under consideration here has to be interpreted in the context of these short- and long-term projects and related support measures.

1.4.5. Pilot Project Definition and Structure

(1) Pilot project background & justification

The analysis of the tourism resources and tourist flows within Guatemala and Las Verapaces has resulted in the following major conclusions:

- The need to consolidate the existing nature areas with high priority attached to forest conservation. Tourism development supporting measures are the formulation of the Verapaz Eco-corridor, promotion and support for private reserves and the introduction of agro-tourism, and
- The need to establish Las Verapaces as a crossroad in Guatemala's tourism network
- Major effects that are to be expected from such development are:
- Securing the remaining nature areas with tourism potential along the Verapaz Eco-corridors, an endeavor that has the highest priority, and
- Diversification toward agro-tourism and cultural tourism with a view to supplement the Eco-corridor formation.

(2) Pilot project preliminary design, development and direct objectives

The short-term project list comprises three categories, namely the proposed pilot project, *short-term projects, the components of which are all related to the proposed Community* Tourism, and other short-term projects that support the tourism facilities infrastructure. Implementing entities are overwhelmingly public sector entities with two accommodation facilities to be realized by the private sector[36]. The major development direction of the pilot project is nature-tourism site development and a Community Tourism development scheme. The pilot project's development and direct project objectives are:

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[35] They were referred to in Volume 2. However, it is preferable in this feasibility study to term them as measures, since not all are to be implemented by the public sector and not for all of them external financing will be required.

[36] Please refer to Volume 2 for a detailed description.

a. Development objective

The development objective of the proposed pilot projects is to strengthen the tourism facilities' structure of the Departments Las Verapaces, thereby contributing to an accelerated socio-economic development of the Departments through direct and indirect economic effects.

b. Direct project objectives

Realization of the proposed pilot project aims at a bundle of direct project objectives that are partly overlapping and partly complimentary[37]. It suffices in the context of this viability investigation to recall the direct project objectives as:

- To promote and encourage nature-based tourism activities
- To improve and add tourist attractiveness and convenience
- To provide tourism information on the surrounding area
- To promote cultural exchange and interaction between local people and visitors, and
- To improve local economic conditions.

(3) Expected project output & results

a. Project outputs

Implementation of the pilot projects is expected to result in the following direct outputs:

- Three improved and upgraded tourism facilities
- An established and operational part of Community Tourism with 1 comet facility, and
- Realization of additional accommodation.

b. Project results

Major project results will be higher visitor numbers in general and more visitors in higher market value segments, as well as a flow of researchers of various fields of expertise interested in eco-tourism related fields.

(4) Pilot Project "Implementing Entity"

The proposed project involves, due to its very nature, both public sector and private sector entities and the same general observations and comments as summarized in the Section for the Petén F/S apply. There are, in principle, five entities that are considered direct stakeholders in the project, namely INGUAT, MICUDE/IDAEH, MICIVI, the Municipality concerned and the "private sector". The Eco-lodge in the Sierra Pampacche

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[37] For a detailed discussion, please refer to the relevant Sections in Volume 2.

Cloud Forest Park hotel facility will be financed by INGUAT and leased out for operations to the private sector or operated by INGUAT themselves (managerial alternative).

The following principles should apply, since the pilot project comprises to a large extent the establishment and/or upgrading of physical facilities:

- Ownership title of the physical facilities to be established should be granted to the entities that are under the existing legal framework responsible for such or similar type of facilities/assets, and
- Hence, O&M cost responsibilities, but also beneficiary of potential revenue streams generated by the facilities should be the very same entities.

1.4.6. Future Tourism Demand Considerations and Projections

The recommendations in Volume 2 for further developing the tourism facilities' infrastructure and related facilities imply that all short-term projects or, in other words, *the related public and private sector investments materialize in a certain pattern and time* related sequence. The implicit key assumption is that there is a parallel cycle between the supply and demand sides, i.e. in particular investment into additional accommodation facilities is realized[38] in parallel with increasing demand so that there is, at no point in time, any demand overhang and/or supply capacity constraint[39]. The future visitor numbers and/or tourism demand patterns and flow projections that are outlined in Volume 2 represent, therefore, the "with" pilot and other short-term project implementation scenario in the tourism development framework for the Las Verapaces PTDA. The main features of the "with" scenario are reproduced for comparative reasons in Table 1.36.

Table 1.36 Las Verapaces PTDA "with case" tourism development framework

Parameter		Unit	2000	2010	2020
Las Verapaces PTDA					
A. Visitor arrivals	International	"000"	49	111	189
	Domestic	"000"	175	239	388
	Total	"000"	224	350	577
B. Bed-nights	International	"000"	107	270	448
	Domestic	"000"	262	358	582
	Total	"000"	369	628	1,030

Source: JICA Study Team.

However, it is necessary, in order to delineate the "with" against the "without" or "do nothing" case to determine, i) the number of international and domestic tourists, as well

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[38] Whenever normal operating capacity is reached in the already existing facilities.

[39] A demand overhang and/or supply capacity constraint in accommodation facilities would automatically imply that visitor numbers, from that point in time, could not increase further and visitor numbers and benefits would have to be capped.

as ii) the number of international and domestic bed-nights that would accrue under the "without" or "do nothing" scenario. "Without" refers to three elements. First, tourism support measures and the pilot project do not materialize and, secondly, the market segmentation measured in terms of average length-of-stay and average bed-nights remains at year 2000 constant values. Table 1.37 identifies the results of the computations in terms of absolute number of tourists and bed-nights. The results are summarized briefly as:

- The accumulated differential up to the year 2020 in total visitor arrivals (international and domestic) is some 210,000 people, and
- The accumulated differential up to the year 2020 is some 759,000 bed-nights.

Table 1.37 "With" and "without" project tourism flow and pattern Las Verapaces PTDA

Parameter	Unit	2000	2010	2020
"WITHOUT " SCENARIO				
1) International visitor arrivals	"000"	49	71	107
2) International bed-nights	"000"	107	182	269
3) Domestic tourists	"000"	175	203	260
4) Domestic bed-nights	"000"	262	305	390
5) Total visitor arrivals	"000"	224	274	367
6) Total bed-nights	"000"	369	487	659
"WITH" SCENARIO				
1) International visitor arrivals	"000"	49	111	189
2) International bed-nights	"000"	124	270	448
3) Domestic tourists	"000"	175	239	388
4) Domestic bed-nights	"000"	262	478	970
5) Total visitor arrivals	"000"	224	350	577
6) Total bed-nights	"000"	386	748	1,418
DIFFERENTIALS BETWEEN SCENARIOS				
1) International visitor arrivals	"000"	0	40	82
2) International bed-nights	"000"	0	88	179
3) Domestic tourists	"000"	0	36	128
4) Domestic bed-nights	"000"	0	173	580
5) Total visitor arrivals	"000"	0	76	210
6) Total bed-nights	"000"	0	261	759

Source: JICA Study Team.

1.4.7. Economic Project Analysis

(1) Project Base and Investment Cost

In general, the economic cost-benefit-analysis (CBA) is based on the basic definitions and assumptions as reported in Section 2 of this Volume 3 and as outlined in detail in this Section of the F/S for the Petén PTDA. They do, therefore, not to be repeated here. Minor additional definitions, in particular as they refer to O&M cost items and responsibilities and the financing structure, are introduced and discussed under the individual headings.

a. Land acquisition & compensation cost; land acquisition schedule

The proposed pilot project and its related supporting short-term projects have six components that may require the acquisition of land for the realization of the facilities. These components are:

- Development of the Verapaz Eco-Corridor Interpretation Center; about 2,000 sqm. In a rural setting. The "best estimate" provided per sqm. is US $ 86, equivalent to about Quetzales 690 per sqm.
- Community tourism Satellite 1. Land requirement is estimated at 500 sqm., and the "best estimate" per sqm. is 58 US $, equivalent to Quetzales 460
- Community tourism Satellite 3. Land requirement is estimated at 1,500 sqm, and the "best estimate" per sqm is US $ 58, equivalent to Quetzales 460
- Community tourism Satellite 4. Land requirement is estimated at sqm 300 with the "best estimate" per sqm at US $ 58, equivalent to Quetzale's 460 per sqm.
- Community tourism Satellite 7, 80 rooms accommodation development. Land requirement are estimated at sqm. 40,000 with the "best estimate" per sqm at US 58, equivalent to Quetzales 460 per sqm, and
- Accommodation development in Alta Verapaz. Land requirement is estimated at sqm. 16,000 with the "best estimate" per sqm. At US $ 58, equivalen to Quetzales 460 per sqm.

Actual land purchase cost, compensation cost, utility relocation cost and administrative overhead are assumed as summarized in Table 1.38.

Table 1.38 Estimated total land acquisition cost

Project Element	Land Acquisition Cost	Compensation Cost	Utility Relocation Cost	Administrative Overhead Cost	Total
Eco-Corridor Interpretation Center	1.380	0.000	0.000	0.021	1.401
Community tourism Satellite 1	0.230	0.000	0.000	0.003	0.233
Community tourism Satellite 3	0.690	0.000	0.000	0.010	0.700
Community tourism Satellite 4	0.138	0.000	0.000	0.002	0.140
Community tourism Satellite 7	18.400	0.000	0.000	0.276	18.676
Alta Verapaz Hotel	7.360	0.000	0.000	0.110	7.470
TOTAL	28.198	0.000	0.000	0.423	28.621

Note: Unit: Million Quetzales
Source: JICA Study Team.

Total land acquisition and related cost are estimated at Quetzales 28,621 million, equivalent to about US dollar 3.578 million or ¥ 432,893 million at the established exchange rates.

It is furthermore assumed that the land acquisition process will be finalized within fiscal year (FY) 2002.

b. Estimated O&M costs for roads and facilities

Routine operation and maintenance expenditures (O&M expenditures) are estimated for the eco trails, the trekking trails, the canopy walkway and other trails on the sites. O&M expenditures for all other facilities are estimated based on the principles and assumptions as outlined in detail under the F/S for the Petén PTDA.

c. Estimated construction engineering base cost

The additional assumptions are identical to those already elaborated on under the Peten PTDA F/S.

Table 1.39 identifies the project base cost in constant 2001 price-base and Table 1.40 summarizes the project base cost in current prices. The implicit meaning of both tables is summarized as:

- Total project base cost in current prices before financing, all cost components and all resources, is estimated at Quetzales 194.21 million, equivalent to about US dollar 24.28 million or ¥ 2,937.43 million
- The share of the engineering base cost, but excluding the Government of Guatemala contribution, is estimated at 71.32 percent of the above total
- The local cost component in the engineering base cost is around Quetzales 107.84 million (about US dollar 13.48 million or ¥ 1,631.08), equivalent to about 85 percent of project engineering base cost
- The foreign cost component in the engineering base cost is about Quetzales 30.68 million (around US dollar 3.84 million or ¥ 464.04 million), equivalent to some 22.15 percent of project engineering base cost
- Total direct cost to the GOG in terms of land acquisition and compensation cost are estimated Quetzales 30.32 million, equivalent to about 15.61 percent of project base cost (all resources and all cost components)
- Administrative overhead represented by the salaries and other fringe benefits of line ministries and other relevant official entities involved in the "Implementing/ Management Entity" of the pilot project is estimated at about Quetzales 2.53 million over the implementation cycle, about 1.3 percent of project base cost (all resources and all cost components)
- Direct government receipts resulting from duties, levies and value-added-tax are estimated at Quetzales 22.84 million or about 11.76 percent of project base cost (all resources and all cost components), and
- The above item represents a direct net benefit to the GOG, if for example no exemptions on duties, levies and VAT will be granted to private sub-contractors.

Table 1.39 Total engineering base cost estimation all resources all cost components Las Verapaces PTDA (in constant 2001 prices)

Major Cost Category	2002			2003			2004			2005			2006			Total			Total (in percent)		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Civil works components *)	0.00	0.00	0.00	40.13	10.03	50.16	40.13	10.03	50.16	0.00	0.00	0.00	0.00	0.00	0.00	80.26	20.06	100.32	57.06	67.78	58.93
2. Rail works component	0.00	0.00	0.00	0.00	3.04	3.04	0.00	3.04	3.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.08	6.08	0.00	20.54	3.57
3. Re-forestation component	0.00	0.00	0.00	0.80	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.80	0.57	0.00	0.47
4. Equipment component	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.80	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.80	1.61	0.57	2.72	0.94
5. Physical contingency **)	0.00	0.00	0.00	4.09	1.31	5.40	4.05	1.35	5.40	0.00	0.00	0.00	0.00	0.00	0.00	8.15	2.65	10.80	5.79	8.97	6.34
6. Engineering base cost sub-total	0.00	0.00	0.00	45.02	14.38	59.40	44.99	15.22	60.21	0.00	0.00	0.00	0.00	0.00	0.00	90.01	29.60	119.61	64.00	100.00	70.26
7. Land acquisition; compensation;	28.20	0.00	28.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.20	0.00	28.20	20.05	0.00	16.56
8. Related administration OH ***)	0.42	0.00	0.42	0.89	0.00	0.89	0.90	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	2.22	4.38	0.00	1.30
9. Duty & levies on Imports	0.00	0.00	0.00	1.08	0.00	1.08	1.14	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	2.22	1.58	0.00	1.30
10. Value -added-tax at 12 percent	3.38	0.00	3.38	7.26	0.00	7.26	7.36	0.00	7.36	0.00	0.00	0.00	0.00	0.00	0.00	18.00	0.00	18.00	12.80	0.00	10.57
11. GOG contribution subtotal	32.00	0.00	32.00	9.23	0.00	9.23	9.41	0.00	9.41	0.00	0.00	0.00	0.00	0.00	0.00	50.64	0.00	50.64	36.00	0.00	29.74
12. Project base cost all resources	32.00	0.00	32.00	54.25	14.38	68.63	54.39	15.22	69.62	0.00	0.00	0.00	0.00	0.00	0.00	140.64	29.60	170.25	100.00	100.00	100.00

Note: Unit: Million Constant Quetzales

*) The civil works components include all physical buildings, related utilities and landscaping.

**) Physical contingency for civil works, tourism farm, rail works and re-forestation components is assumed at 10 percent and for the equipment component at 5 percent.

***) Related administrative overhead covers the salaries and related expenditures incurred by the "Implementing/Management Entity" and other related technical Ministries. It is assessed at 1.5 percent of engineering base cost.

****) The re-forestation component is actually part of the landscaping.

Source: JICA Study Team.

Table 1.40 Total engineering base cost estimation all resources all cost components Las Verapaces PTDA (in current prices)

Major Cost Category	2002			2003			2004			2005			2006			Total			Total (in percent)		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Civil works components *)	0.00	0.00	0.00	46.38	10.33	56.71	49.85	10.49	60.34	0.00	0.00	0.00	0.00	0.00	0.00	96.23	20.82	117.05	58.85	67.85	60.27
2. Rail works component	0.00	0.00	0.00	0.00	3.13	3.13	0.00	3.18	3.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.31	6.31	0.00	20.56	3.25
3. Re-forestation component	0.00	0.00	0.00	0.86	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.86	0.53	0.00	0.44
4. Equipment component	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.80	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.80	1.79	0.61	2.62	0.92
5. Physical contingency **)	0.00	0.00	0.00	4.72	1.35	6.07	5.03	1.41	6.44	0.00	0.00	0.00	0.00	0.00	0.00	9.76	2.75	12.51	5.97	8.97	6.44
6. Engineering base cost sub-total	0.00	0.00	0.00	51.96	14.81	66.77	55.87	15.88	71.76	0.00	0.00	0.00	0.00	0.00	0.00	107.84	30.69	138.53	65.95	100.00	71.33
7. Land acquisition; compensation;	30.32	0.00	30.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.32	0.00	30.32	18.54	0.00	15.61
8. Related administration OH ***)	0.45	0.00	0.45	1.00	0.00	1.00	1.08	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	2.53	0.00	2.53	4.54	0.00	1.30
9. Duty & levies on Imports	0.00	0.00	0.00	1.11	0.00	1.11	1.19	0.00	1.19	0.00	0.00	0.00	0.00	0.00	0.00	2.30	0.00	2.30	1.41	0.00	1.19
10. Value -added-tax at 12 percent	3.64	0.00	3.64	8.15	0.00	8.15	8.75	0.00	8.75	0.00	0.00	0.00	0.00	0.00	0.00	20.54	0.00	20.54	12.56	0.00	10.57
11. GOG contribution subtotal	34.41	0.00	34.41	10.26	0.00	10.26	11.02	0.00	11.02	0.00	0.00	0.00	0.00	0.00	0.00	55.69	0.00	55.69	34.05	0.00	28.67
12. Project base cost all resources	34.41	0.00	34.41	62.22	14.81	77.03	66.90	15.88	82.78	0.00	0.00	0.00	0.00	0.00	0.00	163.53	30.69	194.21	100.00	100.00	100.00

Note: Unit: Million Constant Quetzales

*) The civil works component includes all physical buildings, related utilities and landscaping.

**) Physical contingency for civil works, tourism farm, rail works and re-forestation components is assumed at 10 percent and for the equipment component at 5 percent.

***) Related administrative overhead covers the salaries and related expenditures incurred by the "Implementing/Management Entity" and other related technical Ministries. It is assessed at 1.5 percent of engineering base cost.

****) The re-forestation component is actually part of the landscaping.

Source: JICA Study Team.

d. Proposed project financing structure

The main features of the financing structure as implicitly already reflected above are summarized as:

- After finalization of Guatemala's established internal reviewing and approval procedure, the GOG seeks external financial assistance under a sovereign guaranteed loan agreement
- After the loan agreement is signed, the Ministry of Public Finance allocates the appropriate amounts to the relevant line ministries and/or entities responsible financially for "their" project components
- The allocation by the MOF is treated as a "budget support" item, and

- Hence, no repayment "terms & conditions" apply back to the MOF.

e. Estimated total investment cost

In view of the proposed financing structure, there is no need to establish the project's repayment schedule and debt-service capability in view of the fact that the cash flow is treated as "budget support". There is nevertheless a need to establish the total cost to Guatemala's economy. Hence, interest-during-constructions (IDC) needs to be computed and added to the project base cost, in order to arrive at the total investment requirements, or the capital that will need to be borrowed on the external ODA capital market for pilot project implementation.

Table 1.41 presents the detailed project investment cost (all resources and all cost components), which amount to Quetzales 203.02 million, roughly equivalent to US dollar 25.38 million or ¥ 3,070.68 million. Table 1.42 presents the summary overview of project investment cost in Quetzales, US dollar and Japanese ¥ by major cost components only.

Table 1.41 Project investment cost estimation all resources all cost components Las Verapaces PTDA (in current prices)

Major Cost Category	2002			2003			2004			2005			2006			Total			Total (in percent)		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Civil Works Components *)	0.00	0.00	0.00	46.38	10.33	56.71	49.85	10.49	60.34	0.00	0.00	0.00	0.00	0.00	0.00	96.23	20.82	117.05	58.85	67.86	60.27
2. Rail works Component	0.00	0.00	0.00	0.00	3.13	3.13	0.00	3.18	3.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.31	6.31	0.00	20.57	3.25
3. Re-forestation Component	0.00	0.00	0.00	0.86	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.86	0.53	0.00	0.44
4. Equipment Component	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.80	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.80	1.79	0.61	2.61	0.92
5. Physical Contingency **)	0.00	0.00	0.00	4.72	1.35	6.07	5.03	1.41	6.44	0.00	0.00	0.00	0.00	0.00	0.00	9.76	2.75	12.51	5.97	8.97	6.44
6. Engineering base cost subtotal	0.00	0.00	0.00	51.96	14.81	66.77	55.87	15.88	71.75	0.00	0.00	0.00	0.00	0.00	0.00	107.84	30.68	138.52	65.95	100.00	71.33
7 Land Acquisition; compensation;	30.32	0.00	30.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.32	0.00	30.32	18.54	0.00	15.61
8. Related administration OH ***)	0.45	0.00	0.45	1.00	0.00	1.00	1.08	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	2.53	0.00	2.53	4.54	0.00	1.30
9. Duty & levies on imports	0.00	0.00	0.00	1.11	0.00	1.11	1.19	0.00	1.19	0.00	0.00	0.00	0.00	0.00	0.00	2.30	0.00	2.30	1.41	0.00	1.18
10. Value-added-tax at 12 %	3.64	0.00	3.64	8.15	0.00	8.15	8.75	0.00	8.75	0.00	0.00	0.00	0.00	0.00	0.00	20.54	0.00	20.54	12.56	0.00	10.57
11 GOG Contribution Sub-total	*34.41*	*0.00*	*34.41*	*10.26*	*0.00*	*10.26*	*11.02*	*0.00*	*11.02*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*55.69*	*0.00*	*55.69*	*34.05*	*0.00*	*28.67*
12. Project base cost all resources	34.41	0.00	34.41	62.22	14.81	77.03	66.89	15.88	82.77	0.00	0.00	0.00	0.00	0.00	0.00	163.52	30.68	194.21	100.00	100.00	100.00
13. Working capital requirements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
14. Interest during construction	0.00	0.00	0.00	2.24	0.00	2.24	4.88	0.00	4.88	1.69	0.00	1.69	0.00	0.00	0.00	8.81	0.00	8.81			
15. TOTAL CAPITAL COST	34.41	0.00	34.41	64.46	14.81	79.27	71.77	15.88	87.65	1.69	0.00	1.69	0.00	0.00	0.00	172.33	30.68	203.02			

Note: Unit: Million Constant Quetzales

*) The civil works component includes all physical buildings, related utilities and landscaping.

**) Physical contingency for civil works, tourism farm, rail works and re-forestation components is assumed at 10 percent and for the equipment component at 5 percent.

***) Related administrative overhead covers the salaries and related expenditures incurred by the "Implementing/Management Entity" and other related technical Ministries. It is assessed at 1.5 percent of engineering base cost.

****) The re-forestation component is actually part of the landscaping.

Source: JICA Study Team.

Table 1.42 Summary overview of project investment cost

Parameter	LC	FC	Total	LC	FC	Total	LC	FC	Total
	(Unit: Quetzales)			(Unit: US dollars)			(Unit: Japanese Yen)		
1) Engineering Base Cost	107.84	30.68	138.52	13.48	3.84	17.32	1,631.08	464.04	2,095.12
2) Land Acquisition & Administrative Overhead	32.85	0.00	32.85	4.11	0.00	4.11	496.86	0.00	496.86
3) Levies & VAT *)	22.84	0.00	22.84	2.86	0.00	2.86	345.46	0.00	345.46
4) Working Capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5) IDC	8.81	0.00	8.81	1.10	0.00	1.10	133.25	0.00	133.25
6) Total Capital Cost	172.34	30.68	203.02	21.54	3.84	25.38	2,606.64	464.04	3,070.68

Note: Unit: million

Source: JICA Study Team.

(2) Economic Benefits

The same principles and definitions as outlined and discussed in the F/S for the pilot project in the Petén PTDA apply, that is on the benefit site direct and indirect economic gross benefits are taken into account. Indirect benefits comprise the categories of indirect employment generation, indirect effects generated by investment, multiplier effects generated by tourists' consumption and multiplier effects generated by construction and related civil works.

(3) Cost-benefit analysis (CBA) and projected project returns - EIRR

Direct economic gross benefits in financial prices reflecting the result of the comparison of the "with" and "without" scenarios are summarized in Table 1.43 and indirect economic gross benefits also in financial prices are summarized in Table 1.44.

As indicated earlier, the "without" scenario reflects a situation under which no pilot and related short-term projects are implemented and market distribution remains unchanged at year 2000 characteristics. The "with" scenario reflects implementation of the pilot and related short-term projects and the Las Verapaces PTDA receive a higher share of visitors to Guatemala, the bed-nights increase in response to higher attractiveness of tourism resources and market characteristics shift over the planning horizon to higher value market segments.

Table 1.43 Direct gross economic benefits for "with" against "without" scenarios

CASES	2000	2010	2020
A) Without" Case	84.80	106.08	156.64
B) "With" Case	84.80	168.80	329.44
C) Differential A to B	0.00	62.72	172.80

Note: Unit: million Quetzales
All values are in financial prices.

Source: JICA Study Team.

Table 1.44 Indirect gross economic benefits for "with" against "without" scenarios

Calendar Year	Life Cycle Year	Indirect Gross Benefit 1	Indirect Gross Benefit 2	Multiplier Effects		Total Indirect Economic Benefits
				Tourist Consumption	Construction Sub-sector	
2002	-4	0.00	5.16	0.31	0.00	5.47
2003	-3	0.00	5.16	0.31	2.69	8.16
2004	-2	0.00	5.16	0.31	2.69	8.16
2005	-1	0.00	5.16	0.31	2.69	8.16
2006	1	3.26	5.16	0.31	0.00	8.72
2007	2	3.26	5.16	0.31	0.00	8.72
2008	3	3.26	5.16	0.31	0.00	8.72
2009	4	3.26	5.16	0.31	0.00	8.72
2010	5	3.26	5.16	0.31	0.00	8.72
2011	6	9.14	13.43	0.87	0.00	23.44
2012	7	9.14	13.43	0.87	0.00	23.44
2013	8	9.14	13.43	0.87	0.00	23.44
2014	9	9.14	13.43	0.87	0.00	23.44
2015	10	9.14	13.43	0.87	0.00	23.44
2016	11	9.14	13.43	0.87	0.00	23.44
2017	12	9.14	13.43	0.87	0.00	23.44
2018	13	9.14	13.43	0.87	0.00	23.44
2019	14	9.14	13.43	0.87	0.00	23.44
2020	15	9.14	13.43	0.87	0.00	23.44
2021	16	9.14	13.43	0.87	0.00	23.44
2022	17	9.14	13.43	0.87	0.00	23.44
2023	18	9.14	13.43	0.87	0.00	23.44
2024	19	9.14	13.43	0.87	0.00	23.44
2025	20	9.14	13.43	0.87	0.00	23.44
Total		153.32	247.90	15.83	8.07	425.12

Note: Unit: Number/Quetzales
All values are in financial prices and indirect economic benefits 1 derive from indirect labor generation generated by hotels and indirect economic benefits 2 derive from indirect labor generated by investments.

Source: JICA Study Team.

After converting all financial economic cost and financial direct and indirect economic gross benefits into economic prices, the economic rate of return (EIRR) is computed. The results of the EIRR computations for the "with" as measured against the "without" scenario are illustrated in Table 1.45. The computation results are interpreted to signify the following:

- The EIRR is with 10.29 percent in the medium range indicating, however, the overall economic viability of the proposed pilot and supporting short-term projects.

Table 1.45 Departments Las Verapaces projects' economic costs and benefits (constant 2001 economic prices)

		ECONOMIC COSTS													ECONOMIC BENEFITS			
Year	Life cycle year	Land acquisition	Administrative OH	Civil works	Rail & reforestation element	Equipment component	Physical contingency	Insurance	Levies & duty	Taxes	O&M costs roads	O&M costs facilities	O&M costs equipment	Total	Gross economic benefits	Gross indirect & multiplier benefits	Total benefits	Net economic benefits
2002	-4	25.38	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.74	0.00	3.88	3.88	-21.86
2003	-3	0.00	0.64	35.91	2.82	0.00	3.87	0.00	0.00	0.00	0.00	0.00	0.00	43.24	0.00	5.79	5.79	-37.45
2004	-2	0.00	0.65	35.91	2.25	1.16	3.87	0.00	0.00	0.00	0.00	0.00	0.00	43.84	0.00	5.79	5.79	-38.05
2005	-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.79	5.79	5.79
2006	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	2.23	6.19	8.42	1.29
2007	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	4.45	6.19	10.64	3.51
2008	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	4.45	6.19	10.64	3.51
2009	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	4.45	6.19	10.64	3.51
2010	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	4.45	6.19	10.64	3.51
2011	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2012	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2013	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2014	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2015	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2016	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2017	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2018	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2019	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2020	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2021	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2022	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2023	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2024	19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
2025	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	5.93	0.98	7.14	12.27	16.64	28.91	21.78
Accumulated		25.38	1.65	71.82	5.07	1.16	7.74	0.00	0.00	0.00	4.50	118.60	19.60	255.52	204.08	301.80	505.88	250.36
																EIRR		10.29%
																NPV at 5%		73.54
																NPV at 10%		2
																NPV at 15.0%		-27
																NPV at 20.0%		-40

Note: Unit: million Quetzales

1. The O&M component for other facilities excludes O&M expenditures for the eco-lodge and accommodation facilities in Community Tourism development, since this facility will be leased out to the private sector, which will have to assume O&M responsibilities.

Source: JICA Study Team

- The net-present-value (NPV) indicators are positive for a discount rate of 5 and 10 percent. *The NPV value turns, however, negative at a discount rate of 15 and 20* percent.
- Two conclusions may, therefore, be drawn from the resulting NPV values. Firstly, the *projects are viable, if capital is borrowed at a 2 percent rate*, as is assumed for the proposed projects. Secondly, on the other hand, if the borrowing rate moves into the rate range commercially available in Guatemala, i.e. at or around 20 percent, the projects would move into doubtful economic viability[40]

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[40] The fact that there is no long-term (say 20 years) capital market in Guatemala is neglected here.

- Another conclusion to be drawn is that a shift into higher market value segments over the planning horizon of some 20 years is essential for increasing total net benefits to be generated by the pilot and supporting short-term projects.

(4) EIRR sensitivity analysis

In a final step on the economic appraisal side, a sensitivity test is conducted that investigates how the EIRR will change, if the cost and benefit sides are either over- or underestimated by 10 percent and 20 percent, respectively. This range is selected, since 20 percent is the maximum allowable error margin in either estimating costs or benefits. The sensitivity test is conducted for the "with" against the "without" scenarios. The numerical results of the sensitivity test analysis are summarized in Table 1.46.

Table 1.46 Results of sensitivity analysis EIRR Las Verapaces Departments

	ECONOMIC COSTS				
NET-BENEFITS	Minus 20%	Minus 10%	No Change	Plus 10%	Plus 20%
Plus 20%	EIRR 17.07%	EIRR 14.94%	EIRR 13.14%	EIRR 11.58%	EIRR 10.29%
Plus 10%	EIRR 15.48%	EIRR 13.44%	EIRR 11.71%	EIRR 10.29%	EIRR 8.87%
No Change	EIRR 13.82%	EIRR 11.87%	**EIRR 10.29%**	EIRR 8.74%	EIRR 7.43%
Minus 10%	EIRR 12.08%	EIRR 10.29%	EIRR 8.59%	EIRR 7.16%	EIRR 5.87%
Minus 20%	EIRR 10.29%	EIRR 8.40%	EIRR 6.82%	EIRR 5.41%	EIRR 4.13%

Source: JICA Study Team.

The main conclusions that are derived at from the sensitivity test results are:

- In the worse case, i.e. the economic cost are 20 percent higher than estimated and economic net benefits are overestimated by 20 percent, the projects' EIRR will be around 4 percent, well below the now in Guatemala prevailing capital cost interest rate
- In the best case, that is economic cost are actually 20 percent lower and economic net benefits are higher by 20 percent, the projects' EIRR will be around 17 percent, within the range of the now in Guatemala prevailing capital cost interest rate
- Any EIRR in between the above range is potentially possible, depending on the extent to which either economic cost and/or net benefits were either under- or overestimated
- It is important that the GOG employs a QCBS approach when tendering the projects for private sector execution.

1.4.8. Financial Project Analysis – FIRR of the "Base Case"

All computations for calculating the financial rate of return or FIRR are undertaken in financial constant 2001 price base and covering the pilot project only. All cost-stream items are considered under the "all components & all resources" principle. As is the present case in Guatemala, a split entrance fee for international and domestic visitors is applied. Also, there are separate entrance fees for the site itself and the facilities located on the sites.

(1) Project cost streams and draw-down schedule

The project base cost for the pilot project is computed based on data provided for in Table 1.39, but excluding all other short-term projects

The individual cost items are estimated as:

- Pilot project engineering base cost = Quetzales 23.92 million, including 10 percent contingency for civil works and five percent for the equipment component
- Land acquisition cost: Quetzales 1.38 million
- Administrative overhead: Quetzales 0.708 million
- Duties and levies on all imports: Quetzales 0.526 million
- Value added tax at 12 percent: Quetzales 2.996 million, and
- Total pilot project base cost (all components & all resources): Quetzales 29.53 million.

The underlying draw-down schedule is:

- 2002: land acquisition and related administrative overhead and value added tax
- 2003: fifty percent of civil works and the equipment component, and
- 2004: fifty percent of civil works and the equipment component.

The monetary value of the O&M expenditures estimate is summarized in Table 1.47.

Table 1.47 Estimated O&M cost by major cost components (constant 2001 prices)

O&M Item	Annual O&M Budget Requirement
Trail routine maintenance	0.264
O&M physical facilities	1.211
Maintenance equipment	1.113
Total	2.588

Source: JICA Study Team.

(2) Project revenue streams

Three types of revenue streams are considered for the "base-case" and all other computations, namely revenues generated by visitors accessing the sites and the facilities on the sites, and revenues generated by the eco-lodges, and revenues generated by the sale of "other goods and services" as explained later in the text.

The "base case" is defined such that it reflects the prevailing situation in the fee structure. In other words, the revenue stream generated by visitors is based on a flat entrance fee of Quetzales 50 for the site and Quetzales 25 for the facilities to be paid by international visitors, and Quetzales 15 for the site and Quetzales 5 for the facilities to be paid by domestic visitors. No additional revenues are generated from either sales of "other goods & services" and/or the lease of land and/or property.

Table 1.48 summarizes the result for the Base case", which is 10.57 per cent. That indicates that, from a purely financial point of view, the pilot project under the prevailing fee structure is in the medium range of financial viability.

Table 1.48 Results of "base case" financial rate of return – FIRR

Calendar Year	Cycle Year	Full Cost/Full Revenues				
		Base Cost	O&M Cost	Revenue Streams		Net Revenue
				Visitors	Other Revenues	
2002	-4	(1.57)	0.00	0.00	0.00	(1.57)
2003	-3	(13.98)	0.00	0.00	0.00	(13.98)
2004	-2	(13.98)	*0.00*	*0.00*	*0.00*	*(13.98)*
2005	-1	0.00	0.00	1.57	2.38	3.96
2006	1	0.00	(2.59)	1.57	4.77	3.75
2007	2	0.00	(2.59)	1.57	4.77	3.75
2008	3	0.00	(2.59)	1.57	4.77	3.75
2009	4	0.00	(2.59)	1.57	4.77	3.75
2010	5	0.00	(2.59)	1.57	4.77	3.75
2011	6	0.00	(2.59)	1.57	4.77	3.75
2012	7	0.00	(2.59)	1.57	4.77	3.75
2013	8	0.00	(2.59)	1.57	4.77	3.75
2014	9	0.00	(2.59)	1.57	4.77	3.75
2015	10	0.00	(2.59)	1.57	4.77	3.75
2016	11	0.00	(2.59)	1.57	4.77	3.75
2017	12	0.00	(2.59)	1.57	4.77	3.75
2018	13	0.00	(2.59)	1.57	4.77	3.75
2019	14	0.00	(2.59)	1.57	4.77	3.75
2020	15	0.00	(2.59)	1.57	4.77	3.75
2021	16	0.00	(2.59)	1.57	4.77	3.75
2022	17	0.00	(2.59)	1.57	4.77	3.75
2023	18	*0.00*	(2.59)	1.57	4.77	3.75
2024	19	*0.00*	(2.59)	1.57	4.77	3.75
2025	20	*0.00*	(2.59)	1.57	4.77	3.75
Accumulated		*(29.53)*	*(51.76)*	*33.03*	*97.68*	*49.42*
FINANCIAL IRR						*10.57%*

Note: Unit: million Quetzales

Source: JICA Study Team.

1.4.9. FIRR Response to Changes in the Entrance Fee Structure

The general recommendations for changes in the entrance fee structure to be charged for access to the sites and facilities on the sites has been discussed already in the relevant Section of the F/S for the Petén PTDA. Also, the same assumptions as for the F/S Petén apply for the formulation of the three additional revenue scenarios. The FIRR results achievable under all four scenarios is presented in Table 1.49 and they are summarized as follows:

Table 1.49 Response of FIRR to revenue scenarios - results of pilot project FIRR Las Verapaces (2001 constant price base)

		Prevailing Fee Structure					International Q100site/Q50 facility					International Q100site/Q50 facility/I plus Q50 person					International Q100site/Q50 facility/I plus Q100 person				
Calendar Year	Cycle Year	Base Cost	O&M Cost	Revenue Other	Revenue Visitors	Net Revenue	Base Cost	O&M Cost	Revenue Other	Revenue Visitors	Net Revenue	Base Cost	O&M Cost	Revenue Other	Revenue Visitors	Net Revenue	Base Cost	O&M Cost	Revenue Other	Revenue Visitors	Net Revenue
2002	-4	(1.57)	0.00	0.00	0.00	(1.57)	(1.57)	0.00	0.00	0.00	(1.57)	(1.57)	0.00	0.00	0.00	(1.57)	(1.57)	0.00	0.00	0.00	(1.57)
2003	-3	(13.98)	0.00	0.00	0.00	(13.98)	(13.98)	0.00	0.00	0.00	(13.98)	(13.98)	0.00	0.00	0.00	(13.98)	(13.98)	0.00	0.00	0.00	(13.98)
2004	-2	(13.98)	0.00	0.00	0.00	(13.98)	(13.98)	0.00	0.00	0.00	(13.98)	(13.98)	0.00	0.00	0.00	(13.98)	(13.98)	0.00	0.00	0.00	(13.98)
2005	-1	0.00	0.00	2.38	1.57	3.95	0.00	0.00	2.38	2.57	4.95	0.00	0.00	2.38	3.10	5.48	0.00	0.00	2.38	3.63	6.01
2006	1	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2007	2	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2008	3	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2009	4	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2010	5	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2011	6	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2012	7	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2013	8	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2014	9	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2015	10	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2016	11	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2017	12	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2018	13	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2019	14	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2020	15	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2021	16	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2022	17	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2023	18	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2024	19	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
2025	20	0.00	(2.59)	4.77	1.57	3.75	0.00	(2.59)	4.77	2.57	4.75	0.00	(2.59)	4.77	3.10	5.28	0.00	(2.59)	4.77	3.63	5.81
Accumulated		*(29.53)*	*(51.80)*	*97.78*	*32.97*	*49.42*	*(29.53)*	*(51.80)*	*97.78*	*54.05*	*70.50*	*(29.53)*	*(51.80)*	*97.78*	*65.12*	*81.57*	*(29.53)*	*(51.80)*	*97.76*	*76.27*	*92.72*
FINANCIAL IRR						*10.57%*					*14.00%*					*15.69%*					*17.33%*

Note: Unit: million Quetzales
Source: JICA Study Team.

- The FIRR for the "revenue scenario 1"[41] is with 14.00 percent significantly higher than the FIRR for the "base case"
- The FIRRs for the revenue scenarios 2 and 3 are with 15.69 and 17.33 percent in an attractive range.

As is the case for the Petén F/S, the following general conclusions and recommendations must be drawn from the above picture:

- Prevailing entrance fee levels for sites and museums for international visitors are too low. They should perhaps be standardized at least for "World Heritage Sites" and doubled
- It is desirable from a financial viability point of view to generate a minimum of additional Q 50 per international visitors, preferably an additional Q 100, in order to bring the financial viability of the pilot project into a range that is quite attractive to the ownership entity. Such additional revenues may result either from the sales of "other goods and services" and/or the lease of land and/or property located on the sites, and

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[41] As per definition explained in the Peten F/S.

- The appropriate authorities should adjust nominal fee levels on a regular basis (perhaps every two to three years) at lest to reflect general inflationary developments within the economy.

Also, and in addition to the general conclusions, a case-specific conclusion is that the cash flow of the pilot project are the revenues generated by the lodges. Hence, financial project viability is likely to be highly sensitive to the price achievable under given market circumstances.

1.4.10. Construction Method

Two potential approaches are possible either directly by the line entities concerned or through tendering and sub-contracting to the private sector as seems to be the common practice in Guatemala. If the sub-contracting to the private sector approach is adopted, the numbers in the feasibility calculation would have to be adjusted for "duties & levies" and the VAT, which would then actually not reflect direct project cost, but direct revenues to the GOG generated by project realization.

1.4.11. Implementation Time Schedule

Total project realization is assumed at 2 years or 24 months beginning in 2003. It is assumed that loan preparation, from assessment mission to signature of the loan agreement will take up to one year, i.e. 2002. Hence, the facilities could be opened to the public in January 2005.

1.5. Feasibility Assessment of the Pilot Project in the Southwestern Highlands PTDA

1.5.1. Existing and Projected Socio-economic & Regional Development Frameworks

The two Departments of Quetzaltenango and Totonicapan (in the following for the purpose of this F/S Southwestern Highlands) have an estimated population size of some 1,039,551 people[42] (year 2000, about 9.1 percent of Guatemala's total population size in that very year).

The absolute population size of the Southwestern Highlands according to the 1981 and 1994 population census data was 571,368 and 775,951 people, respectively[43]. Hence, the gross population growth rate is 2.38 percent over the period 1981 to 1994, and 4.99 percent over the six-year period 1994 to 2000. The implied long-term 1981 to 2000 population growth rate is with 3.20 percent slightly below the national average of 3.4 percent.

1994 population census results allow for the identification of the then prevailing urban/rural split, as well as the ethnic composition of the population base. These data indicate that the Southwestern Highlands were a somewhat predominantly rural area (Totonicapan 89.3 per cent of the population and Quetzaltenango about 60.2 per cent of the 1994 population) mainly comprising an indigenous population (Totonicapan 94.5 percent indigenous; Quetzaltenango about 59.6 per cent indigenous)[44].

Quetzaltenango had in the year 2000 some 24 and Totonicapan some eight municipalities. The largest municipalities in Quetzaltenango are Quetzaltenango (148,108 urban dwellers) and Coatepeque (94,389 urban dwellers). The largest municipalities in Totonicapan are Totonicapan (about 103,173 urban dwellers) AND Momostenango (some 89,123 urban dwellers). The urban structure in Quetzaltenango is characterized and dominated by 18 municipalities in the "10,000 to 50,000" population size category[45]. An urbanization rate cannot, at this point in time, be indicated, due to a lack of time-series on the Department's rural/urban split.

The two Departments are part of Guatemala's "Development Region VI"[46]. Detailed reliable past performance gross regional domestic product (GRDP) data have not been made available. However, using a "cross-referencing" approach and common sense allow for tentative, but not conclusive general observations on most likely past trends in GRDP structure and development. The combines population size in the "work-age" bracket of 15 to 64 years is estimated by the national statistical institute INE at some 751,596 people, equivalent to 72.3 percent of the absolute population size in the year 2000[47]. Formal sector employment is derived at by using a 35 percent participation rate. That results in some 311,864 formal sector employees in the year 2000, or about 41.5 percent of the working-age population size.

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[42] Estimated and enumerated by the national statistical institute, INE. Please consult with Appendix 1 for more details.

[43] Please consult with Appendix 8 for details.

[44] Please consult with Appendices.

[45] Please consult with Appendices.

[46] The other Departments in Development Region VI are Sololá, Suchitepequez, Retalhuleu and San Marcos.

The distribution of formal sector employment over major economic sectors in both Departments combined is estimated at 63.8 percent for agriculture (equivalent to 199,067 people); 15.6 percent in industry (equivalent to around 48,660 people) 4.4 percent in the construction sub-sector (equivalent to about 13,724 people); 10.1 percent in the trade sub-sector (equivalent to about 31,498 people); 4.7 percent in the services sub-sector (equivalent to about 14,671 people); 0.8 percent in public administration (about 2,577 people), and 0.5 percent (about 1,667 people) for which the formal economic sector cannot be identified.

Implied "open unemployment" is estimated at 19,542 people (around 2.6 percent of the working age population); implied "open under-employment" is estimated at 131,428 people (around 17.5 percent of the working age population), and the implied "informal sector labor force" is therefore estimated at around 288,659 persons, or around 38.4 percent of the working age population size.

It is possible to roughly calculate from such data a static picture for the GRDP of the Southwestern Highlands in the year 2000 GRDP, including the implied GRDP's structural composition. The values are derived at by applying national average sector-labor productivity data to the estimated formal sector employment data, and in comparison average national level productivity data. Table 1.50 presents the results of that approach for the GRDP estimation in 1958 constant Quetzales and Table 1.51 for a likely structural composition of the Southwestern Highlands GRDP in the year 2000.

Table 1.50 Rough estimation for the Southwestern Highlands GRDP size in 2000

Parameter	Based on Sub-sector Labor Productivity (2)	Based on National Average Labor Productivity (3)
Absolute GRDP Size	514.9	440.7
Share in GDP	10.57%	9.04%

Note: Unit: Million Quetzales/Percent

Source: JICA Study Team.

Hence, the Southwestern Highlands which account for roughly 9.0 percent of the total economically active population in the formal sector accounted in the year 2000 for between 9.0 per cent to 10.6 per cent of total national level GDP (measured in constant 1958 Quetzales prices) and covering the formal sector of the economy only.

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[47] Please consult with Appendices.

Table 1.51 Rough estimation for the Southwestern Highlands GRDP structure in 2000

At National Level			At Southwestern Highlands Level		
Parameter	*% of Labor Force*	*% of GDP*	*Parameter*	*% of Labor Force*	*% of GRDP*
Primary Sector	58.1	23.1	Primary Sector	63.8	21.8
Secondary Sector	17.7	20.3	Secondary Sector	20.0	15.4
Tertiary Sector	24.2	56.6	Tertiary Sector	16.2	62.8
Total	100.0	100.0	Total	100.0	100.0

Note: Unit: percent of total
1) The sector definition is according to United Nations standard classification.
2) Public Administration is included under the tertiary sector.

Source: JICA Study Team.

Though the above data have to be interpreted with caution, due to the approach employed in estimating the departmental level data, the following features appear to be quite characteristic:

- The relationship between labor force employed and share of output produced in the primary sectors hints at the quite low level in terms of efficiency, size and technology employed in the Southwestern Highlands primary sector. Some 64 percent of the two Department's labor force produces only about 22 percent of GRDP, where some 58 percent of total national level labor force produce some 23 percent of GDP, and
- The tertiary sector, which comprises all services, including tourism and tourism related economic activities, produces with only 16.2 percent of the labor force some 63 percent of GRDP. It is therefore fair to state that the tertiary sector, including tourism and tourism related service activities, are quite important for the Southwestern Highlands in terms of overall gross output.

It is not recommendable for projecting Las Verapaces PTDA socio-economic framework to use a "*one point-in-time*" *related projection approach, given the high uncertainty level* in past regional & local level empirical socio-economic data. As a consequence, a scenario approach is adopted to project trend corridors for the socio-economic fundamentals of absolute population size; formal sector employment, GRDP and per capita income in current Quetzales.

Three scenarios are defined, namely a "linear past trend scenario"; a "low-end" as well as a "high-end" scenario. The fundamental underlying assumptions for the three scenarios are summarized in Table 1.52. Table 1.53 provides the numerical results of the major socio-economic parameter projected up to the planning horizon of 2020. It should be kept generally in mind that the Southwestern Highlands are a predominantly rural area over the past 20 years, the economic base of the Departments is predominantly agricultural-based (in terms of labor force size) and it may be at a relatively early stage of development in terms of labor force availability and its skill level composition, economic structure, scope and depth of such structure, and modern sector enterprise-base.

The number of informal sector and formal sector SME's could not be established with certainty.

Table 1.52 **Assumptions for scenario formulation to project socio-economic fundamentals of the Southwestern Highlands 2000 to 2020**

"Low-end" Scenario	Linear Past Trend Scenario	"High-end" Scenario
Qualitative assumptions	Qualitative assumptions	Qualitative assumptions
1) Political & economic instability	1) Past trends & interrelationships continue over the coming 20 years	1) Growth in the national, regional and global economy accelerates
2) Private sector investment stagnates	2) Socio-economic fundamentals remain at similar levels	2) Domestic and foreign direct investment picks up & consumer confidence is restored
3) No focused development efforts at national & regional levels	3) The tourism sector remains at the same level in terms of "scope" & "depth"	3) Tourism development is guided by coordinated and targeted resource allocation (public & private)
4) Tourism sector remains fragmented and negatively effected by downturn in visitor arrivals		
Basic numerical assumptions	Basic numerical assumptions	Basic numerical assumptions
1) Population size growth: 4.1%	1) Population size growth: 3.20%	1) Population size growth: 2.75%
2) Real GRDP Growth: 2.0%	2) Real GRDP Growth: 4.5%	2) Real GRDP Growth: 6.5%
3) Inflation rate: 6.0%	3) Inflation rate: 7.0%	3) Inflation rate: 5.0%

Source: JICA Study Team.

Table 1.53 **Projection of major socio-economic parameter for the Southwestern Highlands 2000 to 2020**

Main Socio-economic Parameter	Year	Low-end Scenario	Linear Past Trend Scenario	High-end Scenario
Absolute Population Size (Number of people)	2000	1,039,551	1,039,551	1,039,551
	2010	1,553,650	1,424,436	1,363,528
	2020	2,321,991	1,951,821	1,788,473
Formal Sector Employment (Number of people)	2000	311,864	311,864	311,864
	2010	543,778	498,553	477,235
	2020	812,697	683,137	625,966
GRDP (current prices) (Million Quetzales)	2000	17,436	17,436	17,436
	2010	37,643	51,784	51,784
	2020	81,268	153,796	153,796
Current price per capita income (Quetzales)	2000	16,773	16,773	16,773
	2010	24,229	36,354	37,978
	2020	35,184	78,796	85,923

Source: JICA Study Team.

1.5.2. Southwestern Highlands PTDA Projected Tourism Development Direction

Volume 2 elaborates in detail on the regional development direction of the Southwestern Highlands and there is no need to repeat this discussion here[48] in detail.

The Southwestern Highlands have some 58 important tourism resources (21 in Totonicapan and 37 in Quetzaltenango), the major number of which are indigenous culture-based resources. The major tourism development issues and the basic tourism development strategy as identified in the tourism development plan are summarized in Table 1.54 and the general tourism structure is identified in Table 1.55.

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[48] Please refer to Volume 2 for details.

Table 1.54 Major tourism development issues and development strategy for the Southwestern Highlands

Tourism Development Issues	Tourism Development Strategy
1) Dead end of Guatemala's tourism network	1) Function as a "bridge" between Chiapas Highlands of Mexico and Guatemalan Highlands
2) Traditional townscape is being lost	2) Introduce alternative tourism products that promote cultural exchange between tourists & indigenous communities
3) Tourism value of indigenous culture has not been recognized	3) Use colonial & vernacular houses for tourism purposes
4) Lack of visitor facilitation	4) Develop production of handicrafts as tourism attraction & spas
5) Handicrafts are not used well for tourism purposes	
6) It is not easy to differentiate the area from neighboring destinations such as Panajachel & Chichicastenango	

Note: The numbering does not imply a ranking of priority.

Source: JICA Study Team.

Table 1.55 Directions for spatial tourism structure development

Tourism Structure	Existing Structural Features	Additional/Future Structural Features	
		Short-term	Long-term
Tourism Center	Quetzaltenango		
Tourism Sub-center	None		
Major Tourism Area	Quetzaltenango & surrounding areas San Francisco El Alto	Momostenango Zunil San Martin Sacatepequez	Volcanic mountain area
Major Tour Route	Quetzaltenango & surrounding areas Quetzaltenango - San Francisco El Alto	Quetzaltenango - San Francisco El Alto – Momostenango Quetzaltenango - La Esperanza- San Martin Sacatepequez Quetzaltenango - Zunil	Quetzaltenango - Zunil - Volcanic mountain area Quetzaltenango - San Martin Sacatepequez – Volcanic mountain area
International Linkage	None		Quetzaltenango - Mexico
Inter-regional Linkage	None	Quetzaltenango – Huehuetenango – Ixil Quetzaltenango - Panajachel/ Chichicastenango Pacific coast area - Quetzaltenango	Quetzaltenango – Northern Huehuetenango

Source: JICA Study Team.

1.5.3. Southwestern Highlands PTDA Supporting Infrastructure Development and Public Sector Projects

Upgrading of the Central American Highway is on-going between Guatemala City and near Sololá. Funding for this project is provided through multi- and bilateral cooperation. Other national highways and departmental roads are also being improved. However, improvement of National Road 7W that connects between Huehuetenango and Cobán would support the creation of a tourism circuit in Guatemala that is expected to benefit this area.

The public investment process works the same as is described for the other two relevant Section of this document. However, no list of the public investment projects during FY 2001 has been made available and, hence, a detailed discussion of such on-going projects cannot be introduced here.

1.5.4. Southwestern Highlands PTDA Tourism Development Support Measures 2000 to 2020 and Short-term Projects

Tourism development support measures are divided in the tourism development plan into two rough groups, those recommended for implementation before 2010 (short-term), and those that should be implemented between 2010 and 2020. There are some six (6) short-term and some five (5) long-term development projects and measures[49] that are in line with the tourism development strategy for the Southwestern Highlands PTDA. The pilot project under consideration, i.e. the establishment of a Community Tourism in Momostenango, has to be interpreted in the context of the other short- and long-term projects and related support measures.

1.5.5. Pilot Project Definition and Structure

(1) Pilot project background & justification

The analysis of the tourism resources and tourist flows within Guatemala and the Southwestern Highlands has resulted in the following major conclusions:

- The need to revitalize indigenous cultures through tourism, mainly through the realization of the key concept of a Community Tourism
- The need for tourism to make suitable use of historical towns
- The need to strengthen the linkage with tourism destinations beyond Cuatro Caminos, and
- The need to improve visitor facilities of nature-tourism sites.

Major effects that are to be expected from such development are:

- Strengthening the identity, culture and traditions of living indigenous cultures, and
- Increasing the level of control of local people over their resources

(2) Pilot project preliminary design, development and direct objectives

The short-term project list comprises three categories, namely the proposed pilot project, of a Community Tourism in Momostenango, and other short-term and long-term projects that support the tourism facilities infrastructure. Implementing entities are overwhelmingly public sector entities with the accommodation facilities to be realized by the private sector[50]. The major development direction of the pilot project is living *indigenous cultural site development. The pilot project's development and direct project* objectives are:

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[49] They were referred to in the "Interim Report1"as "projects". However, it is preferable in this feasibility study to term them as measures, since not all are to be implemented by the public sector and not for all of them external financing will be required.

a. Development objective

The development objective of the proposed pilot projects is to strengthen the economic, social and cultural welfare of living indigenous cultures in the Southwestern Highlands, thereby contributing to an accelerated socio-economic development of the Southwestern Highlands through direct and indirect economic effects.

b. Direct project objectives

Realization of the proposed pilot project aims at a bundle of direct project objectives that are partly overlapping and partly complimentary[51]. It suffices in the context of this viability investigation to recall the direct project objectives as:

- To revitalize indigenous cultures
- To improve and add tourist attractiveness and convenience
- To provide tourism information on the surrounding area
- To promote cultural exchange and interaction between local people and visitors, and
- To improve local economic conditions.

(3) Expected project output & results

a. Project outputs

Implementation of the pilot projects is expected to result in the following direct outputs:

- The establishment of a Community Tourism with satellite facilities, and
- Realization of additional accommodation.

b. *Project results*

Major project results will be higher visitor numbers in general and more visitors in higher *market value segments.*

(4) Pilot project "implementing entity"

The proposed project involves, due to its very nature, both public sector and private sector entities and the same general observations and comments as summarized in the previous relevant Sections apply. There are, in principle, six (6) entities that are considered direct stakeholders in the project, namely the local communities, the Municipalities, INGUAT, INFOM, NGOs concerned and the "private sector". The private sector is expected to implement the sub-contracts and to finance and construct in Quetzaltenango a 269 room hotel. The 30 room middle class hotel facility in Community Tourism in Momostenango may be leased out to the private sector under a concession agreement.

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[50] Please refer to Volume 2 for a detailed description.

[51] For a detailed discussion, please refer to Volume 2.

1.5.6. Future Tourism Demand Considerations and Projections

The recommendations in Volume 2 for further developing the tourism facilities' infrastructure and related facilities imply that all short-term projects or, in other words, the related public and private sector investments materialize in a certain pattern and time related sequence. The implicit key assumption is that there is a parallel cycle between the supply and demand sides, i.e. in particular investment into additional accommodation facilities is realized[52] in parallel with increasing demand so that there is, at no point in time, any demand overhang and/or supply capacity constraint[53]. The future visitor numbers and/or tourism demand patterns and flow projections that are outlined in Volume 2 represent, therefore, the "with" pilot and other short-term project implementation scenario in the tourism development framework for the Southwestern Highlands PTDA. The main features of the "with" scenario are reproduced for comparative reasons in Table 1.56.

Table 1.56 Southwestern Highlands PTDA "with case" tourism development framework

Parameter	Unit	2000	2010	2020
Southwestern Highlands PTDA				
A. Visitor arrivals				
International	"000"	67	113	177
Domestic	"000"	317	412	642
Total	"000"	384	525	819
B. Bed-nights				
International	"000"	298	437	669
Domestic	"000"	475	618	963
Total	"000"	773	1,055	1,632

Source: JICA Study Team.

However, it is necessary, in order to delineate the "with" against the "without" or "do nothing" case to determine: i) the number of international and domestic tourists, as well as ii) the number of international and domestic bed-nights that would accrue under the "without" or "do nothing" scenario. "Without" refers to two elements. First, tourism support measures and the pilot project do not materialize and, secondly, the market segmentation measured in terms of average length-of-stay and average bed-nights remains at year 2000 constant values. Table 1.57 identifies the results of the computations in terms of absolute number of tourists and bed-nights. The results are summarized briefly as:

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[52] Whenever normal operating capacity is reached in the already existing facilities.

[53] A demand overhang and/or supply capacity constraint in accommodation facilities would automatically imply that visitor numbers, from that point in time, could not increase further and visitor numbers and benefits would have to be capped.

- The accumulated differential up to the year 2020 in total visitor arrivals (international and domestic) is some 222,000 people, and
- The accumulated differential up to the year 2020 is some 434,000 bed-nights.

Table 1.57 "With" and "without" project tourism flow and pattern Southwestern Highlands PTDA

Parameter	Unit	2000	2010	2020
"WITHOUT " SCENARIO				
1) International visitor arrivals	"000"	67	97	145
2) International bed-nights	"000"	298	375	548
3) Domestic tourists	"000"	317	362	452
4) Domestic bed-nights	"000"	475	510	650
5) Total visitor arrivals	"000"	384	459	597
6) Total bed-nights	"000"	773	885	1,198
"WITH" SCENARIO				
1) International visitor arrivals	"000"	67	113	177
2) International bed-nights	"000"	298	437	669
3) Domestic tourists	"000"	317	412	642
4) Domestic bed-nights	"000"	475	618	963
5) Total visitor arrivals	"000"	384	525	819
6) Total bed-nights	"000"	773	1,055	1,632
DIFFERENTIALS BETWEEN SCENARIOS				
1) International visitor arrivals	"000"	0	16	32
2) International bed-nights	"000"	0	62	121
3) Domestic tourists	"000"	0	50	190
4) Domestic bed-nights	"000"	0	108	313
5) Total visitor arrivals	"000"	0	66	222
6) Total bed-nights	"000"	0	170	434

Source: JICA Study Team

1.5.7. Economic Project Analysis

(1) Project base and investment cost

In general , the economic cost-benefit-analysis (CBA) is based on the basic definitions and assumptions as reported in Section 2 of this Volume 3 and as outlined in detail in the previous Sections under this heading. Minor additional definitions, in particular as they refer to O&M cost items and responsibilities and the financing structure, are introduced and discussed under the individual headings.

a. Land acquisition & compensation cost; land acquisition schedule

The proposed pilot project and its related supporting short-term projects have twelve components that may require the acquisition of land for the realization of the facilities. These components are:

- Community Tourism Satellite 2; about 500 sqm. in an urban setting. The "best estimate" provided per sqm. is US $ 86, equivalent to about Quetzales 690 per sqm.
- Community Tourism Satellite 3. Land requirement is estimated at 2,500 sqm., and the "best estimate" per sqm. is 58 US $, equivalent to Quetzales 460
- Community Tourism Satellite 4. Land requirement is estimated at 1,500 sqm. In a rural setting, and the "best estimate" per sqm is US $ 58, equivalent to Quetzales 460

- Community Tourism Satellite 5. Land requirement is estimated at sqm. 1,000 in an urban setting with the "best estimate" per sqm at US $ 86, equivalent to Quetzales 690 per sqm.
- Community Tourism Satellite 6. Land requirement is estimated at sqm. 500 in an urban setting with the "best estimate" per sqm at US $ 86, equivalent to Quetzales 690 per sqm.
- Community Tourism Satellite 7. Land requirement is estimated at sqm. 2,000 in a rural setting with the "best estimate" per sqm at US $ 58, equivalent to Quetzales 460 per sqm.
- Community Tourism Satellite 8. Land requirement is estimated at sqm. 300 in an urban setting with the "best estimate" per sqm at US $ 86, equivalent to Quetzales 690 per sqm.
- Community Tourism Satellite 9/hotel development. Land requirement is estimated at sqm. 3,000 in a rural setting with the "best estimate" per sqm at US $ 58, equivalent to Quetzales 460 per sqm.
- Traditional Toy Museum. Land requirement is estimated at sqm. 3,000 in an urban setting, with the "best estimate" per sqm at US $ 86, equivalent to Quetzales 690 per sqm
- Handicrafts Showcase. Land requirement is estimated at sqm. 2,000 in an urban setting, with the "best estimate" per sqm. At US$ 86, equivalent to Quetzales 690 per sqm.
- Integrated tourism development around San Martin. Land requirement is estimated at sqm. 500 in an urban setting, with the "best estimate" per sqm at US $ 58, equivalent to Quetzales 460 per sqm.
- Accommodation development in Quetzaltenango and Totonicapan. Land requirment is estimated at sqm. 23,900, with the "best estimate" per sqm. At US $ 75, equivalen to Quetzales 600 per sqm.

Actual land purchase cost, compensation cost, utility relocation cost and administrative overhead are assumed as summarized in Table 1.58.

Table 1.58 Estimated total land acquisition cost

Project Element	Land acquisition	Compensation	Utility relocation	Administrative overhead	Total
Community Tourism Satellite 2	*0.345*	*0.000*	*0.000*	*0.005*	*0.350*
Community Tourism Satellite 3	1.150	0.000	0.000	0.017	1.167
Community Tourism Satellite 4	0.690	0.000	0.000	0.010	0.700
Community Tourism Satellite 5	0.690	0.000	0.000	0.010	0.700
Community Tourism Satellite 6	0.345	0.000	0.000	0.005	0.350
Community Tourism Satellite 7	0.920	0.000	0.000	0.014	0.934
Community Tourism Satellite 8	0.207	0.000	0.000	0.003	0.210
Community Tourism Satellite 9	1.380	0.000	0.000	0.021	1.401
Traditional Toy Museum	2.070	0.000	0.000	0.031	2.101
Handicrafts Showcase	1.380	0.000	0.000	0.021	1.401
San Martin tourism development	0.230	0.000	0.000	0.003	0.233
Accommodation development	14.340	0.000	0.000	0.215	14.555
TOTAL	23.747	0.000	0.000	0.356	24.103

Note: Unit: Million Quetzales
Source: JICA Study Team.

Total land acquisition and related cost are estimated at Quetzales 24.103 million, equivalent to about US dollar 3.01 million or ¥ 364.56 million at the established exchange rates.

It is furthermore assumed that the land acquisition process will be finalized within fiscal year (FY) 2003.

b. Estimated O&M costs for roads and facilities

Routine operation and maintenance expenditures (O&M expenditures) are estimated for the trails, the walkways and on the sites. O&M expenditures for all other facilities are estimated based on the principles and assumptions as outlined in detail in the previous relevant Sections.

c. Estimated construction engineering base cost

The additional assumptions are identical to those already elaborated on in previous relevant Sections.

Table 1.59 identifies the project base cost in constant 2001 price-base and Table 1.60 summarizes the project base cost in current prices. The implicit meaning of both tables is summarized as:

- Total project base cost in current prices before financing, all cost components and all resources, is estimated at Quetzales 232.04 million, equivalent to about US dollar 29.01 million or ¥ 3,509.61 million
- The share of the engineering base cost, but excluding the Government of Guatemala contribution, is estimated at 75.76 percent of the above total
- The local cost component in the engineering base cost is around Quetzales 146.32 million (about US dollar 18.29 million or ¥ 2,213.09 million), equivalent to about 83 percent of project engineering base cost

- The foreign cost component in the engineering base cost is about Quetzales 29.47 million (around US dollar 3.68 million or ¥ 445.73 million), equivalent to some 16.76 percent of project engineering base cost

Table 1.59 **Total engineering base cost estimation all resources all cost components Southwestern Highlands PTDA (in constant 2001 prices)**

Major Cost	2002			2003			2004			2005			2006			Total			Total [in percent]		
Category	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Civil works component	0.00	0.00	0.00	0.00	0.00	0.00	48.19	12.05	60.23	48.19	12.05	60.23	0.00	0.00	0.00	96.37	24.09	120.46	62.16	86.21	65.83
2. Equipment component	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38	1.38	2.75	0.00	0.00	0.00	1.38	1.38	2.75	0.89	4.92	1.50
3. Physical contingency **)	0.00	0.00	0.00	0.00	0.00	0.00	4.82	1.20	6.02	4.89	1.27	6.16	0.00	0.00	0.00	9.71	2.48	12.18	6.26	8.87	6.66
4. Engineering base cost subtotal	0.00	0.00	0.00	0.00	0.00	0.00	53.00	13.25	66.26	54.45	14.70	69.14	0.00	0.00	0.00	107.45	27.95	135.40	69.31	100.00	74.00
5. Land acquisition, compensation	11.87	0.00	11.87	11.87	0.00	11.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.75	0.00	23.75	15.32	0.00	12.98
6. Related administration OH***)	0.18	0.00	0.18	0.18	0.00	0.18	0.99	0.00	0.99	1.04	0.00	1.04	0.00	0.00	0.00	2.39	0.00	2.39	5.02	0.00	1.30
7. Duty & levies on imports	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.99	1.10	0.00	1.10	0.00	0.00	0.00	2.10	0.00	2.10	1.35	0.00	1.15
8. Value -added-tax at 12 percent	1.42	0.00	1.42	1.42	0.00	1.42	8.07	0.00	8.07	8.43	0.00	8.43	0.00	0.00	0.00	19.35	0.00	19.35	12.48	0.00	10.57
9. GOG contribution subtotal	13.48	0.00	13.48	13.48	0.00	13.48	10.06	0.00	10.06	10.57	0.00	10.57	0.00	0.00	0.00	47.58	0.00	47.58	30.69	0.00	26.00
10. Project base cost (all resources)	13.48	0.00	13.48	13.48	0.00	13.48	63.06	13.25	76.31	65.02	14.70	79.71	0.00	0.00	0.00	155.03	27.95	182.98	100.00	100.00	100.00

Note: Unit: Million Constant Quetzales
*) Civil works includes all physical buildings, related utilities and landscaping.
**) Physical contingency for civil works is assumed at 10 percent and for the equipment component at 5 percent.
***) Related administrative overhead covers the salaries and related expenditures incurred by the "Implementing/Management Entity" and other related technical Ministries. It is assessed at 1.5 percent of engineering base cost.

Source: JICA Study Team computations.

Table 1.60 **Total engineering base cost estimation all resources all cost components Southwestern Highlands PTDA (in current prices)**

Major Cost	2002			2003			2004			2005			2006			Total			Total [in percent]		
Category	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Civil Works component	0.00	0.00	0.00	0.00	0.00	0.00	59.87	12.60	72.47	64.36	12.79	77.15	0.00	0.00	0.00	124.22	25.39	149.61	61.32	86.16	64.48
2. Equipment component	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.21	1.47	10.68	0.00	0.00	0.00	9.21	1.47	10.69	4.55	4.97	4.60
3. Physical contingency **)	0.00	0.00	0.00	0.00	0.00	0.00	5.99	1.26	7.25	6.90	1.35	8.25	0.00	0.00	0.00	12.88	2.61	15.50	6.36	8.86	6.68
4. Engineering base cost sub-total	0.00	0.00	0.00	0.00	0.00	0.00	65.85	13.86	79.71	80.47	15.61	96.07	0.00	0.00	0.00	146.32	29.47	175.79	72.23	100.00	75.76
5. Land Acquisition, compensation	12.76	0.00	12.76	13.72	0.00	13.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.48	0.00	26.48	13.07	0.00	11.41
6. Related administration OH ***)	0.19	0.00	0.19	0.21	0.00	0.21	1.20	0.00	1.20	1.44	0.00	1.44	0.00	0.00	0.00	3.03	0.00	3.03	5.39	0.00	1.31
7. Duty & levies on imports	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	1.04	1.17	0.00	1.17	0.00	0.00	0.00	2.21	0.00	2.21	1.09	0.00	0.95
8. Value -added-tax at 12 percent	1.53	0.00	1.53	1.65	0.00	1.65	9.69	0.00	9.69	11.67	0.00	11.67	0.00	0.00	0.00	24.54	0.00	24.54	12.11	0.00	10.57
9. GOG contribution sub-total	14.48	0.00	14.48	15.57	0.00	15.57	11.93	0.00	11.93	14.28	0.00	14.28	0.00	0.00	0.00	56.26	0.00	56.26	27.77	0.00	24.24
10. Project base cost (all resources)	14.48	0.00	14.48	15.57	0.00	15.57	77.78	13.86	91.64	94.75	15.61	110.35	0.00	0.00	0.00	202.58	29.47	232.04	100.00	100.00	100.00

Note: Unit: Million Current Quetzales

Source: JICA Study Team computations.

- Total direct cost to the GOG in terms of land acquisition and compensation cost are estimated Quetzales 26.48 million, equivalent to about 11.41 percent of project base cost (all resources and all cost components)

- Administrative overhead represented by the salaries and other fringe benefits of line ministries and other relevant official entities involved in the "Implementing/Management Entity" of the pilot project is estimated at about Quetzales 3.03 million over the implementation cycle, about 1.3 percent of project base cost (all resources and all cost components)

- Direct government receipts resulting from duties, levies and value-added-tax are estimated at Quetzales 26.75 million or about 11.53 percent of project base cost (all resources and all cost components), and

- The above item represents a direct net benefit to the GOG, if for example no exemptions on duties, levies and VAT will be granted to private sub-contractors.

d. Proposed project financing structure

The main features of the financing structure as implicitly already reflected above are summarized as:

- *After finalization of Guatemala's established internal reviewing and approval* procedure, the GOG seeks external financial assistance under a sovereign guaranteed loan agreement
- After the loan agreement is signed, the Ministry of Public Finance allocates the appropriate amounts to the relevant line ministries and/or entities responsible financially for "their" project components
- The allocation by the MOF is treated as a "budget support" item, and
- Hence, no repayment "terms & conditions" apply back to the MOF.

e. Estimated total investment cost

In view of the proposed financing structure, there is no need to establish the project's repayment schedule and debt-service capability in view of the fact that the cash flow is treated as "budget support". There is nevertheless a need to establish the total cost to Guatemala's economy. Hence, interest-during-constructions (IDC) needs to be computed and added to the project base cost, in order to arrive at the total investment requirements, or the capital that will need to be borrowed on the external ODA capital market for pilot project implementation.

Table 1.61 presents the detailed project investment cost (all resources and all cost components), which amount to Quetzales 257.91 million, roughly equivalent to US dollar 32.24 million or ¥ 3,901.04 million. Table 1.62 presents the summary overview of project investment cost in Quetzales, US dollar and Japanese Yen by major cost components only.

Table 1.61 Project investment cost estimation all resources all cost components the Southwestern Highlands PTDA (in current prices)

Major Cost Category	2002			2003			2004			2005			2006			Total			Total (in percent)		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
1. Civil Works component	0.00	0.00	0.00	0.00	0.00	0.00	59.87	12.60	72.47	64.36	12.79	77.15	0.00	0.00	0.00	124.22	25.39	149.61	61.32	86.16	64.48
2. Equipment component	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.21	1.47	10.68	0.00	0.00	0.00	9.21	1.47	10.68	4.55	4.97	4.60
3. Physical contingency *)	0.00	0.00	0.00	0.00	0.00	0.00	5.99	1.26	7.25	6.90	1.35	8.25	0.00	0.00	0.00	12.88	2.61	15.50	6.36	8.86	6.68
4. Engineering base cost sub-total	0.00	0.00	0.00	0.00	0.00	0.00	65.85	13.86	79.71	80.47	15.61	96.07	0.00	0.00	0.00	146.32	29.47	175.79	72.23	100.00	75.76
5. Land acquisition, compensation;	12.76	0.00	12.76	13.72	0.00	13.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.48	0.00	26.48	13.07	0.00	11.41
6. Related administration OH **)	0.19	0.00	0.19	0.21	0.00	0.21	1.20	0.00	1.20	1.44	0.00	1.44	0.00	0.00	0.00	3.03	0.00	3.03	5.39	0.00	1.31
7. Duty & levies on imports	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	1.04	1.17	0.00	1.17	0.00	0.00	0.00	2.21	0.00	2.21	1.09	0.00	0.95
8. Value -added-tax at 12 percent	1.53	0.00	1.53	1.65	0.00	1.65	9.69	0.00	9.69	11.67	0.00	11.67	0.00	0.00	0.00	24.54	0.00	24.54	12.11	0.00	10.57
9. GOG contribution sub-total	14.48	0.00	14.48	15.57	0.00	15.57	11.93	0.00	11.93	14.28	0.00	14.28	0.00	0.00	0.00	56.26	0.00	56.26	27.77	0.00	24.24
10. Project base cost (all resources)	14.48	0.00	14.48	15.57	0.00	15.57	77.78	13.86	91.64	94.75	15.61	110.35	0.00	0.00	0.00	202.58	29.47	232.04	100.00	100.00	100.00
11. Working capital requirements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
12. Interest during construction	0.00	0.00	0.00	0.92	0.00	0.92	3.98	0.00	3.98	6.28	0.00	6.28	14.69	0.00	14.69	25.87	0.00	25.87			
13. Total capital cost	14.48	0.00	14.48	16.49	0.00	16.49	81.76	13.86	95.62	101.03	15.61	116.63	14.69	0.00	14.69	228.45	29.47	257.91			

Note: Unit: Million Current Quetzales

Source: JICA Study Team computations.

Table 1.62 Summary overview of project investment cost

Parameter	LC	FC	Total	LC	FC	Total	LC	FC	Total
	(Unit: Quetzales)			(Unit: US dollars)			(Unit: Japanese Yen)		
1) Engineering Base Cost	146.32	29.47	175.79	18.29	3.68	21.97	2,213.09	445.73	2,658.82
2) Land Acquisition & Administrative Overhead	29.51	0.00	29.51	3.69	0.00	3.69	446.34	0.00	446.34
3) Levies & VAT *)	26.75	0.00	26.75	3.34	0.00	3.34	404.59	0.00	404.59
4) Working Capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5) IDC	25.87	0.00	25.87	3.23	0.00	3.23	391.28	0.00	391.28
6) Total Capital Cost	228.45	29.47	257.92	28.56	3.68	32.24	3,455.31	445.73	3,901.04

Note: Unit: million

Source: JICA Study Team.

(2) Economic benefits

The same principles and definitions as outlined and discussed in the F/S for the other pilot projects apply, that is on the benefit site direct and indirect economic gross benefits are taken into account. Indirect benefits comprise the categories of indirect employment generation, indirect effects generated by investment, multiplier effects generated by tourists' consumption and multiplier effects generated by construction and related civil works.

(3) Cost-benefit analysis (CBA) and projected project returns - EIRR

Direct economic gross benefits in financial prices reflecting the result of the comparison of the "with" and "without" scenarios are summarized in Table 1.63 and indirect economic gross benefits also in financial prices are summarized in Table 1.64.

As indicated earlier, the "without" scenario reflects a situation under which no pilot and related short-term projects are implemented and market distribution remains unchanged at year 2000 characteristics. The "with" scenario reflects implementation of the pilot and related short-term projects and the Southwestern Highlands receive a higher share of visitors to Guatemala, the bed-nights increase in response to higher attractiveness of tourism resources and market characteristics shift over the planning horizon to higher value market segments.

Table 1.63 Direct gross economic benefits for "with" against "without" scenarios

CASES	2000	2010	2020
A) Without" Case	167.54	190.55	237.01
B) "With" Case	167.54	289.39	525.37
C) Differential A to B	0.00	98.85	288.37

Note: Unit: million Quetzales
All values are in financial prices.
Source: JICA Study Team.

Table 1.64 Indirect gross economic benefits for "with" against "without" scenarios

Calendar Year	Life cycle Year	Indirect gross Benefit 1	Indirect gross Benefit 2	Multiplier Effects		
				Tourist Consumption	Construction Sub-sector	Total Indirect Economic Benefits
2002	-4	0.00	4.09	0.65	0.00	4.73
2003	-3	0.00	4.09	0.65	2.46	7.20
2004	-2	0.00	4.09	0.65	2.46	7.20
2005	-1	0.00	4.09	0.65	2.46	7.20
2006	1	2.42	4.09	0.65	0.00	7.16
2007	2	2.42	4.09	0.65	0.00	7.16
2008	3	2.42	4.09	0.65	0.00	7.16
2009	4	2.42	4.09	0.65	0.00	7.16
2010	5	2.42	4.09	0.65	0.00	7.16
2011	6	12.09	17.69	0.65	0.00	30.42
2012	7	12.09	17.69	0.65	0.00	30.42
2013	8	12.09	17.69	0.65	0.00	30.42
2014	9	12.09	17.69	0.65	0.00	30.42
2015	10	12.09	17.69	0.65	0.00	30.42
2016	11	12.09	17.69	0.65	0.00	30.42
2017	12	12.09	17.69	0.65	0.00	30.42
2018	13	12.09	17.69	0.65	0.00	30.42
2019	14	12.09	17.69	0.65	0.00	30.42
2020	15	12.09	17.69	0.65	0.00	30.42
2021	16	12.09	17.69	0.65	0.00	30.42
2022	17	12.09	17.69	0.65	0.00	30.42
2023	18	12.09	17.69	0.65	0.00	30.42
2024	19	12.09	17.69	0.65	0.00	30.42
2025	20	12.09	17.69	0.65	0.00	30.42
Total		193.41	302.09	15.54	7.38	518.42

Note: Unit: Number/ Quetzales
All values are in financial prices and indirect economic benefits 1 derive from indirect labor generation generated by hotels and indirect economic benefits 2 derive from indirect labor generated by investments.
Source: JICA Study Team.

After converting all financial economic cost and financial direct and indirect economic gross benefits into economic prices, the economic internal rate of return (EIRR) is computed. The results of the EIRR computations for the "with" as measured against the "without" scenario are illustrated in Table 1.65. The computation results are interpreted to signify the following:

- The EIRR is with 14.98 percent in an attractive range indicating the overall economic viability of the proposed pilot and supporting short-term projects

Table 1.65 Southwestern Highlands projects' economic costs and benefits (constant 2001 economic prices)

		ECONOMIC COSTS													ECONOMIC BENEFITS			
Year	Life cycle year	Land acquisition	Administrative OH	Civil works	Other elements	Equipment component	Physical contingency	Insurance	Levies & duty	Taxes	O&M costs horse trail	O&M costs facilities	O&M costs equipment	Total	Gross economic benefits	Gross indirect & multiplier benefits	Total benefits	Net economic benefits
2002	-4	10.68	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.83	0.00	3.36	3.36	-7.47
2003	-3	10.68	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.83	0.00	5.11	5.11	-5.72
2004	-2	0.00	0.84	43.13	0.00	0.00	4.31	0.00	0.00	0.00	0.00	0.00	0.00	48.28	0.00	5.11	5.11	-43.17
2005	-1	0.00	0.88	43.13	0.00	2.00	4.41	0.00	0.00	0.00	0.00	0.00	0.00	50.42	0.00	5.11	5.11	-45.31
2006	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	3.51	5.11	8.62	1.24
2007	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	7.02	5.11	12.13	4.75
2008	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	7.02	5.11	12.13	4.75
2009	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	7.02	5.11	12.13	4.75
2010	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	7.02	5.11	12.13	4.75
2011	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2012	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2013	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2014	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2015	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2016	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2017	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2018	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2019	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2020	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2021	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2022	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2023	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2024	19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
2025	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	7.06	0.31	7.38	20.47	21.60	42.07	34.69
Accumulated		21.36	2.02	86.26	0.00	2.00	8.72	0.00	0.00	0.00	0.25	141.20	6.20	268.01	338.64	368.24	706.88	438.87
																EIRR		14.98%
																NPV at 5%		159.37
																NPV at 10%		47
																NPV at 15.0%		-0
																NPV at 20.0%		-20

Note: Unit: million Quetzales
Source: JICA Study Team.

- The net-present-value (NPV) indicators are positive for a discount rate of 5 and 10 per cent. The NPV value turns, however, negative at a discount rate of 15 and 20 per cent.
- Two conclusions may, therefore, be drawn from the resulting NPV values. Firstly, the projects are viable, if capital is borrowed at a 2 per cent rate, as is assumed for the proposed projects. Secondly, on the other hand, if the borrowing rate moves into the rate range commercially available in Guatemala, i.e. at or around 20 per cent, the projects would move into disputable economic viability[54]
- Another conclusion to be drawn is that a shift into higher market value segments over the planning horizon of some 20 years is essential for increasing total net benefits to be generated by the pilot and supporting short-term projects.

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[54]) The fact that there is no long-term (say 20 years) capital market in Guatemala is neglected here.

(4) EIRR sensitivity analysis

In a final step on the economic appraisal side, a sensitivity test is conducted that investigates how the EIRR will change, if the cost and benefit sides are either over- or underestimated by 10 percent and 20 percent, respectively. This range is selected, since 20 percent is the maximum allowable error margin in either estimating costs or benefits. The sensitivity test is conducted for the "with" against the "without" scenarios. The numerical results of the sensitivity test analysis are summarized in Table 1.66.

Table 1.66 Results of sensitivity analysis EIRR the Southwestern Highlands PTDA

	ECONOMIC COSTS				
NET-BENEFITS	Minus 20%	Minus 10%	No Change	Plus 10%	Plus 20%
Plus 20%	EIRR 22.99%	EIRR 20.43%	EIRR 18.32%	EIRR 16.54%	EIRR 14.98%
Plus 10%	EIRR 21.08%	EIRR 18.68%	EIRR 16.69%	EIRR 14.98%	EIRR 13.50%
No Change	EIRR 19.12%	EIRR 16.87%	**EIRR 14.98%**	EIRR 13.36%	EIRR 11.93%
Minus 10%	EIRR 17.10%	EIRR 14.98%	EIRR 13.19%	EIRR 11.63%	EIRR 10.26%
Minus 20%	EIRR 14.98%	EIRR 12.98%	EIRR 11.28%	EIRR 9.78%	EIRR 8.45%

Source: JICA Study Team.

The main conclusions that are derived at from the sensitivity test results are:

- In the worse case, i.e. the economic cost are 20 percent higher than estimated and economic net benefits are overestimated by 20 percent, the projects' EIRR will be around 8.5 percent, somewhat below the now in Guatemala prevailing capital cost interest rate
- In the best case, that is economic cost are actually 20 percent lower and economic net benefits are higher by 20 percent, the projects' EIRR will be around 23 percent, well above the range of the now in Guatemala prevailing capital cost interest rate
- Any EIRR in between the above range is potentially possible, depending on the extent to which either economic cost and/or net benefits were either under- or overestimated
- It is important that the GOG employs a QCBS approach when tendering the projects for private sector execution.

1.5.8. Financial Project Analysis – FIRR of the "Base Case"

All computations for calculating the financial rate of return or FIRR are undertaken in financial constant 2001 price base and covering the pilot project only. All cost-stream items are considered under the "all components & all resources" principle. As is the present case in Guatemala, a split entrance fee for international and domestic visitors is applied. Also, there are separate entrance fees for the site itself and the facilities located on the sites.

(1) Project cost streams and draw-down schedule

The project base cost for the pilot project is computed based on data provided for in Table 1.59, but excluding all other short-term projects

The individual cost items are estimated as:

- Pilot project engineering base cost = Quetzales 26.04 million, including 10 per cent contingency for civil works and five per cent for the equipment component
- Land acquisition cost: Quetzales 5.73 million
- Administrative overhead: Quetzales 0.75 million
- Duties and levies on all imports: Quetzales 0.43 million
- Value added tax at 12 per cent: Quetzales 3.86 million, and
- Total pilot project base cost (all components & all resources): Quetzles 36.81 million.

The underlying draw-down schedule is:

- 2002: land acquisition and related administrative overhead and value added tax
- 2003: land acquisition and related administrative overhead and value added tax
- 2004: fifty per cent of civil works and the equipment component, and
- 2005: fifty per cent of civil works and the equipment component.

The monetary value of the O&M expenditures estimate is summarized in Table 1.67.

Table 1.67 Estimated O&M cost by major cost components (constant 2001 prices)

O&M item	Annual O&M budget requirement
Horse trail routine maintenance	0.018
O&M physical facilities	1.827
Maintenance equipment	0.239
Total	2.084

Source: JICA Study Team.

(2) Project revenue streams

Three types of revenue streams are considered for the "base-case" and all other computations, namely revenues generated by visitors accessing the sites and the facilities on the sites, and revenues generated by the accommodation facility (Community Tourism Satellite 9), and revenues generated by the sale of "other goods and services" as explained later in the text.

The "base case" is defined such that it reflects the prevailing situation in the fee structure. In other words, the revenue stream generated by visitors is based on a flat entrance fee of Quetzales 50 for the site and Quetzales 25 for the facilities to be paid by international visitors, and Quetzales 15 for the site and Quetzales 5 for the facilities to be paid by domestic visitors. No additional revenues are generated from either sales of "other goods & services" and/or the lease of land and/or property.

Table 1.68 summarizes the result for the "base-case", which is 13.98 percent. That indicates that, from a purely financial point of view, the pilot project even under the prevailing fee structure is somewhat attractive it being clearly understood that the accommodation facilities (Community Tourism Satellite 9) are the cash-cow of the pilot project from a financial perspective.

Table 1.68 Results of "base case" financial rate of return – FIRR

		Full Cost/Full Revenues				
Calendar Year	Cycle Year	Base Cost	O&M Cost	Revenue Streams Visitors	 Other revenues	Net Revenue
2002	-4	(3.39)	0.00	0.00	0.00	(3.39)
2003	-3	(3.39)	0.00	0.00	0.00	(3.39)
2004	-2	(14.03)	0.00	0.00	0.00	(14.03)
2005	-1	(16.00)	0.00	0.00	0.00	(16.00)
2006	1	0.00	(2.08)	0.34	6.26	4.52
2007	2	0.00	(2.08)	0.69	6.26	4.86
2008	3	0.00	(2.08)	1.03	6.26	5.20
2009	4	0.00	(2.08)	1.38	6.26	5.55
2010	5	0.00	(2.08)	1.72	6.26	5.89
2011	6	0.00	(2.08)	2.07	6.26	6.24
2012	7	0.00	(2.08)	2.41	6.26	6.58
2013	8	0.00	(2.08)	2.75	6.26	6.93
2014	9	0.00	(2.08)	3.10	6.26	7.27
2015	10	0.00	(2.08)	3.44	6.26	7.61
2016	11	0.00	(2.08)	3.79	6.26	7.96
2017	12	0.00	(2.08)	4.13	6.26	8.30
2018	13	0.00	(2.08)	4.13	6.26	8.30
2019	14	0.00	(2.08)	4.13	6.26	8.30
2020	15	0.00	(2.08)	4.13	6.26	8.30
2021	16	0.00	(2.08)	4.13	6.26	8.30
2022	17	0.00	(2.08)	4.13	6.26	8.30
2023	18	*0.00*	(2.08)	4.13	6.26	8.30
2024	19	*0.00*	(2.08)	4.13	6.26	8.30
2025	20	*0.00*	(2.08)	4.13	6.26	8.30
Accumulated		*(36.81)*	*(41.68)*	*59.91*	*125.10*	*106.52*
FINANCIAL IRR						*13.98%*

Note: Unit: million Quetzales
Source: JICA Study Team.

1.5.9. FIRR Response to Changes in the Entrance Fee Structure

The general recommendations for changes in the entrance fee structure to be charged for access to the sites and facilities on the sites has been discussed already in the relevant Section of the other two F/S investigations. Also, the same assumptions as for the other two F/S' apply for the formulation of the three additional revenue scenarios. The FIRR results achievable under all four scenarios is presented in Table 1.69 and they are summarized as follows:

Table 1.69 Response of FIRR to revenue scenarios - results of pilot project FIRR Southwestern Highlands PTDA (2001 constant price base)

		Prevailing Fee Structure					International Q100site/Q50 facility					International Q100site/Q50 facility/I plus Q50 person					International Q100site/Q50 facility/I plus Q100 person				
Calendar Year	Cycle Year	Base Cost	O&M Cost	Revenue Other	Revenue Visitors	Net Revenue	Base Cost	O&M Cost	Revenue Hotel	Revenue Visitors	Net Revenue	Base Cost	O&M Cost	Revenue Hotel	Revenue Visitors	Net Revenue	Base Cost	O&M Cost	Revenue Hotel	Revenue Visitors	Net Revenue
2002	-4	(3.39)	0.00	0.00	0.00	(3.39)	(3.39)	0.00	0.00	0.00	(3.39)	(3.39)	0.00	0.00	0.00	(3.39)	(3.39)	0.00	0.00	0.00	(3.39)
2003	-3	(3.39)	0.00	0.00	0.00	(3.39)	(3.39)	0.00	0.00	0.00	(3.39)	(3.39)	0.00	0.00	0.00	(3.39)	(3.39)	0.00	0.00	0.00	(3.39)
2004	-2	(14.03)	0.00	0.00	0.00	(14.03)	(14.03)	0.00	0.00	0.00	(14.03)	(14.03)	0.00	0.00	0.00	(14.03)	(14.03)	0.00	0.00	0.00	(14.03)
2005	-1	(16.00)	0.00	0.00	0.00	(16.00)	(16.00)	0.00	0.00	0.00	(16.00)	(16.00)	0.00	0.00	0.00	(16.00)	(16.00)	0.00	0.00	0.00	(16.00)
2006	1	0.00	(2.08)	6.26	0.34	4.52	0.00	(2.08)	6.26	0.91	5.09	0.00	(2.08)	6.26	1.66	5.84	0.00	(2.08)	6.26	2.41	6.59
2007	2	0.00	(2.08)	6.26	0.69	4.87	0.00	(2.08)	6.26	1.81	5.99	0.00	(2.08)	6.26	3.31	7.49	0.00	(2.08)	6.26	4.81	8.99
2008	3	0.00	(2.08)	6.26	1.03	5.21	0.00	(2.08)	6.26	2.72	6.90	0.00	(2.08)	6.26	4.97	9.15	0.00	(2.08)	6.26	7.22	11.40
2009	4	0.00	(2.08)	6.26	1.38	5.56	0.00	(2.08)	6.26	3.63	7.81	0.00	(2.08)	6.26	6.62	10.80	0.00	(2.08)	6.26	9.62	13.80
2010	5	0.00	(2.08)	6.26	1.72	5.90	0.00	(2.08)	6.26	4.53	8.71	0.00	(2.08)	6.26	8.28	12.46	0.00	(2.08)	6.26	12.03	16.21
2011	6	0.00	(2.08)	6.26	2.07	6.25	0.00	(2.08)	6.26	5.44	9.62	0.00	(2.08)	6.26	9.93	14.11	0.00	(2.08)	6.26	14.43	18.61
2012	7	0.00	(2.08)	6.26	2.41	6.59	0.00	(2.08)	6.26	6.35	10.53	0.00	(2.08)	6.26	11.59	15.77	0.00	(2.08)	6.26	16.84	21.02
2013	8	0.00	(2.08)	6.26	2.75	6.93	0.00	(2.08)	6.26	7.25	11.43	0.00	(2.08)	6.26	13.25	17.43	0.00	(2.08)	6.26	19.24	23.42
2014	9	0.00	(2.08)	6.26	3.10	7.28	0.00	(2.08)	6.26	8.16	12.34	0.00	(2.08)	6.26	14.90	19.08	0.00	(2.08)	6.26	21.65	25.83
2015	10	0.00	(2.08)	6.26	3.44	7.62	0.00	(2.08)	6.26	9.06	13.24	0.00	(2.08)	6.26	16.56	20.74	0.00	(2.08)	6.26	24.05	28.23
2016	11	0.00	(2.08)	6.26	3.79	7.97	0.00	(2.08)	6.26	9.97	14.15	0.00	(2.08)	6.26	18.21	22.39	0.00	(2.08)	6.26	26.46	30.64
2017	12	0.00	(2.08)	6.26	4.13	8.31	0.00	(2.08)	6.26	10.88	15.06	0.00	(2.08)	6.26	19.87	24.05	0.00	(2.08)	6.26	28.86	33.04
2018	13	0.00	(2.08)	6.26	4.13	8.31	0.00	(2.08)	6.26	10.88	15.06	0.00	(2.08)	6.26	19.87	24.05	0.00	(2.08)	6.26	28.86	33.04
2019	14	0.00	(2.08)	6.26	4.13	8.31	0.00	(2.08)	6.26	10.88	15.06	0.00	(2.08)	6.26	19.87	24.05	0.00	(2.08)	6.26	28.86	33.04
2020	15	0.00	(2.08)	6.26	4.13	8.31	0.00	(2.08)	6.26	10.88	15.06	0.00	(2.08)	6.26	19.87	24.05	0.00	(2.08)	6.26	28.86	33.04
2021	16	0.00	(2.08)	6.26	4.13	8.31	0.00	(2.08)	6.26	10.88	15.06	0.00	(2.08)	6.26	19.87	24.05	0.00	(2.08)	6.26	28.86	33.04
2022	17	0.00	(2.08)	6.26	4.13	8.31	0.00	(2.08)	6.26	10.88	15.06	0.00	(2.08)	6.26	19.87	24.05	0.00	(2.08)	6.26	28.86	33.04
2023	18	*0.0C*	(2.08)	6.26	4.13	8.31	*0.00*	(2.08)	6.26	10.88	15.06	*0.00*	(2.08)	6.26	19.87	24.05	*0.00*	(2.08)	6.26	28.86	33.04
2024	19	*0.0C*	(2.08)	6.26	4.13	8.31	*0.00*	(2.08)	6.26	10.88	15.06	*0.00*	(2.08)	6.26	19.87	24.05	*0.00*	(2.08)	6.26	28.86	33.04
2025	20	*0.0C*	(2.08)	6.26	4.13	8.31	*0.00*	(2.08)	6.26	10.88	15.06	*0.00*	(2.08)	6.26	19.87	24.05	*0.00*	(2.08)	6.26	28.86	33.04
Accumulated		*(36.81)*	*(41.60)*	*125.20*	*59.89*	*106.68*	*(36.81)*	*(41.60)*	*125.20*	*157.72*	*204.51*	*(36.81)*	*(41.60)*	*125.20*	*288.09*	*334.88*	*(36.81)*	*(41.60)*	*125.20*	*418.47*	*465.26*
FINANCIAL IRR						*13.99%*					*19.83%*					*25.36%*					*29.69%*

Note: Unit: million Quetzales

Source: JICA Study Team.

- The FIRR for the "revenue scenario 1"[55] is with 19.83 per cent significantly higher than the FIRR for the "base case"
- The FIRRs for the revenue scenarios 1 and 2 are with 25.36 and 29.69 percent in a very attractive range, even if the project was financed under commercial terms

The following general conclusions and recommendations must be drawn from the above picture:

- Prevailing entrance fee levels for sites and museums for international visitors are too low at national level. They should perhaps be standardized at least for "World Heritage Sites" and doubled, though the pilot project case of the Southwestern Highlands is financially no so dependent on such increases
- Notwithstanding the above, it is still desirable to generate a minimum of additional Q 50 per international visitors, preferably an additional Q 100, in order to optimize financial viability of the pilot project into a range that is very attractive to the

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[55] As per previous definition

ownership entity. Such additional revenues may result either from the sales of "other goods and services" and/or the lease of land and/or property located on the sites, and

- The appropriate authorities should adjust nominal fee levels on a regular basis (perhaps every two to three years) at lest to reflect general inflationary developments within the economy.

Also, and in addition to the general conclusions, a case-specific conclusion is that the cash-cow of the pilot project are the revenues generated by the hotel facility. Hence, financial project viability is likely to be highly sensitive to the price achievable under given market circumstances.

1.5.10. Construction Method

Two potential approaches are possible, either directly by the line entities concerned or through tendering and sub-contracting to the private sector as seems to be the common practice in Guatemala. If the sub-contracting to the private sector approach is adopted, the numbers in the feasibility calculation would have to be adjusted for "duties & levies" and the VAT, which would then actually not reflect direct project cost, but direct revenues to the GOG generated by project realization.

1.5.11. Implementation Time Schedule

Total project realization is assumed at 2 years or 24 months beginning in 2004. Land acquisition is assumed to take two years, due to the fact that most plots are urban land and acquisition is, therefore, more complicated and lengthy. It is assumed that loan preparation, from assessment mission to signature of the loan agreement will take up to one year, i.e. 2002. Hence, the facilities could be opened to the public in January 2006.

1.6. Appendix

Appendix 1 Year 2000 population projections by Department

Department	Rank	Land	Population Size			Population Density
		Area [km^2]	Male	Female	Total	[km^2]
Guatemala	1	2,400	1,264,324	1,314,204	2,578,528	1,074
Huehuetenango	2	2,242	442,913	437,075	879,988	393
San Marcos	3	3,791	434,765	409,722	844,487	223
Alta Verapaz	4	1,105	416,546	397,755	814,301	737
Quiche	5	980	292,946	295,886	588,832	601
Quetzaltenango	6	2,111	342,372	335,878	678,250	321
Escuintla	7	4,384	248,282	235,487	483,769	110
Chimaltenango	8	1,979	216,638	210,963	427,601	216
Suchitepequez	9	2,424	205,885	197,724	403,609	167
Jutiapa	10	1,331	194,312	191,597	385,909	290
Totonicapan	11	1,034	179,317	181,984	361,301	349
Izabal	12	115	174,219	159,736	333,955	2,904
Peten	13	35,854	177,417	155,973	333,390	9
Santa Rosa	14	2,955	165,407	154,407	319,814	108
Chiquimula	15	753	156,637	156,513	313,150	416
Solola	16	924	156,773	151,018	307,791	333
Jalapa	17	289	134,210	135,845	270,055	934
Sacatepequez	18	428	132,686	126,579	259,265	606
Retalhuleu	19	1,856	123,911	118,010	241,921	130
Zacapa	20	386	107,766	105,028	212,794	551
Baja Verapaz	21	268	100,980	102,451	203,431	759
El Progreso	22	1,407	72,414	70,783	143,197	102
TOTAL		108,889	5,740,719	5,644,618	11,385,337	

Notes: 1) Total for the land area does not add up, since some of the municipality areas are not known exactly.
2) Population size figures do not add up, due to unspecified reasons.
3) The ranking is by absolute population size.

Source: JICA Study Team compilation from "Instituto Nacional de Estadística"; 176 aniversario leaflet.

Appendix 2 GDP performance indicators 1985 to 2001 (in constant 1958 prices)

(Unit: Million Quetzales/ per cent)

Parameter	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999 (estim.)	2000 (estim.)	2001 (estim.)	Compound Trend Growth Performance		
														1985 to 1990	*1990* to 1998	*1985* to 1998
Agriculture, Fisheries & Forestry	759.3	877.2	904.4	931.4	951.9	975.2	1,009.4	1,035.2	1,064.2	1,095.6	*1,127.0*	*1,159.2*	*1,192.4*	2.929	2.830	2.861
PRIMARY SECTOR	759.3	877.2	904.4	931.4	951.9	975.2	1,009.4	1,035.2	1,064.2	1,095.6	*1,127.0*	*1,159.2*	*1,192.4*	2.929	2.830	2.861
Mining & Quarrying	6.5	8.5	9.2	12.0	13.3	13.8	15.8	19.5	24.8	30.1	*33.9*	*38.1*	*42.9*	5.512	15.854	12.518
Manufacturing	464.8	510.2	522.3	539.4	555.0	571.4	589.9	601.1	617.4	637.5	*653.2*	*669.3*	*685.7*	1.881	2.724	2.460
Construction	49.7	67.4	68.4	85.8	83.2	83.0	90.4	93.2	101.9	112.0	*119.2*	*126.9*	*135.1*	6.282	6.526	6.450
Utilities (electricly, gas, water, sanitation)	56.3	84.6	87.9	99.9	109.6	115.8	125.7	133.3	152.9	166.0	*180.4*	*196.0*	*213.1*	8.486	8.761	8.675
SECONDARY SECTOR	577.3	670.7	687.8	737.1	761.1	784.0	821.8	847.1	897.0	945.6	*986.7*	*1,030.3*	*1,076.7*	3.045	4.397	3.972
Transport & Communications	209.8	269.9	285.9	307.3	322.2	335.6	361.1	374.2	396.3	426.2	*450.1*	*475.3*	*501.9*	5.167	5.802	5.603
Commerce	747.0	816.1	850.2	888.4	924.5	977.2	1,036.5	1,064.6	1,104.6	1,154.9	*1,194.3*	*1,235.0*	*1,277.1*	1.785	4.155	3.409
Banking &, Insurance	*263.1*	*310.5*	*324.5*	*338.3*	*355.3*	*373.2*	*397.9*	*464.4*	*485.4*	*514.0*	*541.2*	*569.8*	*599.9*	*3.368*	*6.170*	*5.286*
Communal, Social & Personal Services *)	379.6	445.1	460.9	481.1	513.2	537.5	552.0	517.9	541.2	556.5	*573.1*	*590.2*	*607.9*	3.235	2.874	2.987
TERTIARY SECTOR	1,599.5	1,841.6	1,921.5	2,015.1	2,115.2	2,223.5	2,347.5	2,421.1	2,527.5	2,651.6	*2,758.6*	*2,870.3*	*2,986.7*	2.859	4.494	3.980
LESS:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*	*0.0*	*0.0*	0.000	0.000	0.000
GROSS DOMESTIC PRODUCT - GDP	2,936.1	3,389.5	3,513.7	3,683.6	3,828.2	3,982.7	4,178.7	4,303.4	4,488.7	4,692.8	*4,872.3*	*5,059.8*	*5,255.8*	2.914	4.068	3.706

Note: All data are preliminary and subject to revisison as and when additional information becomes available.

*) Includes "Hotel & Restaurant Services", as well as "Business Services".

**) The GDP format was adjusted to follow the standard United Nations format, which inludes utilities under the secondary sector.

***) The 1998 value for the "Communal, Social & Personal Services" sub-sector has been estimated using the 1990 to 1997 compound growth rate of 2.832%.

****) The values for the years 1999, 2000 and 2001 have been estimated using the 1985 to 1998 compound growth rate.

Source: JICA Study Team based on data from "Banco de Guatemala" and "Comision Economica para America Latina y el Caribe y Banco de Datos del Comercio Exterior de America Latina y el Caribe".

Appendix 3 GDP performance indicators 1985 to 2001 (in constant 1990 US dollar)

(Unit: Million US dollar/per cent)

Parameter	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999 (estim.)	2000 (estim.)	2001 (estim.)	Compound Trend Growth Performance		
														1985 to 90	1990 to 98	1985 to 98
Agriculture, Fisheries & Forestry	1,522.1	1,758.4	1,812.9	1,867.1	1,908.1	1,954.9	2,024.6	2,075.1	2,115.6	2,178.0	*2,238.9*	*2,301.5*	*2,365.8*	2.928	2.734	2.795
PRIMARY SECTOR	*1,522.1*	*1,758.4*	*1,812.9*	*1,867.1*	*1,908.1*	*1,954.9*	*2,024.6*	*2,075.1*	*2,115.6*	*2,178.0*	*2,238.9*	*2,301.5*	*2,365.8*	*2.928*	*2.734*	*2.795*
Mining & Quarrying	24.8	32.4	35.1	45.6	50.7	52.6	60.3	74.0	94.6	116.7	*131.5*	*148.1*	*166.8*	5.492	16.063	12.651
Manufacturing	874.5	959.9	982.5	1,014.8	1,044.2	1,075.0	1,109.8	1,130.9	1,143.3	1,180.5	*1,208.1*	*1,236.3*	*1,265.1*	1.881	2.542	2.335
Construction	127.4	172.7	175.3	219.9	213.2	212.7	231.7	233.7	224.0	246.2	*259.0*	*272.5*	*286.6*	6.273	4.713	5.198
Utilities (electricity, gas, water, sanitation)	69.1	103.9	107.9	122.7	134.6	142.2	154.3	168.2	188.6	204.8	*222.7*	*242.1*	*263.1*	8.499	8.813	8.715
SECONDARY SECTOR	*1,095.8*	*1,268.9*	*1,300.8*	*1,403.2*	*1,442.7*	*1,482.5*	*1,556.1*	*1,606.8*	*1,650.5*	*1,748.2*	*1,821.2*	*1,898.9*	*1,991.7*	*2.977*	*4.136*	*3.772*
Transport & Communications	528.8	680.3	720.6	774.5	812.1	845.9	909.9	950.7	987.3	1,061.8	*1,120.3*	*1,182.0*	*1,247.1*	5.168	5.664	5.509
Commerce	1,776.0	1,940.3	2,021.4	2,112.2	2,198.0	2,323.3	2,464.3	2,521.6	2,595.5	2,713.7	*2,803.7*	*2,896.6*	*2,992.6*	1.785	4.018	3.315
Banking &, Insurance	606.7	716.0	748.3	780.1	819.3	860.6	917.6	964.4	1,008.0	1,067.4	*1,114.8*	*1,164.3*	*1,216.1*	3.368	4.934	4.442
Communal, Social & Personal Services *)	1,096.9	1,286.2	1,331.9	1.390.2	1,483.0	1,553.2	1,595.1	1.639.9	1,713.7	1.785.4	*1,853.6*	*1,924.3*	*1,997.8*	3.235	4.084	3.818
TERTIARY SECTOR	*4,008.4*	*4,622.8*	*4,822.2*	*5,057.0*	*5,312.4*	*5,583.0*	*5,866.9*	*6,076.6*	*6,304.5*	*6,628.3*	*6,892.3*	*7,167.3*	*7,453.6*	*2.983*	*4.438*	*3.953*
LESS:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*	*0.0*	*0.0*	0.000	0.000	0.000
GROSS DOMESTIC PRODUCT - GDP	6,626.3	7,650.1	7,935.9	8,327.3	8,663.2	9,020.4	9,467.6	9,758.5	10,070.6	10,554.5	*10,952.4*	*11,367.6*	*11,801.1*	2.915	4.019	3.673

Note: All data are preliminary and subject to revision as and when additional information becomes available.

*) Includes "*Hotel* & Restaurant Services", as *well* as "Business Services".

**) The GDP format has been adjusted to follow the standard United Nations format, which includes utilities under the secondary sector.

***) The 1998 value for the "Communal, Social & Personal Services" sub-sector has been estimated using the 1990 to 1997 compound growth rate of 4.185%.

****) The values for the years 1999, 2000 and 2001 have been estimated using the 1985 to 1998 long -term trend growth rate.

Source: JICA Study Team based on data from "Banco de Guatemala" and "Comision Economica para America Latina y el Caribe y Banco de Datos del Comercio Exterior de America Latina *y el Caribe*".

Appendix 4 Ranking of economic sectors by contribution to GDP growth over the period 1985 to 2001

(Unit:per cent)

Rank	Economic Sector	Contribution to 1 % GDP growth Point	
		Absolute	Accumulated
1	Commerce	0.224	0.224
2	Agriculture, fishing, forestry	0.188	0.412
3	Banking & insurance	0.142	0.554
4	Transport & communications	0.127	0.681
5	Com., social & personal services	0.101	0.782
6	Manufacturing	0.095	0.876
7	Utilities	0.070	0.947
8	Construction	0.038	0.985
9	Mining & quarrying	0.015	1.000
	1 % GDP Growth Rate	1.000	

Source: Compiled by JICA Study Team

Appendix 5 Population economically active in the formal economy and labor productivity developments 1985 to 1999 (values are based on constant 1958 prices)

	Unit	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
GDP (in constant 1958 prices)																
Agriculture, forestry and fisheries	Million Quetzales	759.3	753.0	782.4	817.6	842.7	877.2	904.4	931.4	951.9	975.2	1,009.4	1,035.2	1,064.2	1,095.6	1,127.0
Mining & quarrying	"	6.5	8.5	8.4	8.7	9.0	8.5	9.2	12.0	13.3	13.8	15.8	19.5	24.8	30.1	33.9
Manufacturing	"	464.8	467.9	477.4	487.9	499.1	510.2	522.3	539.4	555.0	571.4	589.9	601.1	617.4	637.5	653.2
Construction	"	49.7	51.2	58.7	67.9	73.2	67.4	68.4	85.8	83.2	83.0	90.4	93.2	101.9	112.0	119.2
Utilities	"	56.3	63.2	68.2	74.1	79.9	84.6	87.9	99.9	109.6	115.8	125.7	133.3	152.9	166.0	180.4
Transport & communications	"	209.8	210.6	220.8	230.4	254.3	269.9	285.9	307.3	322.2	335.6	361.1	374.2	396.3	426.2	450.1
Commerce	"	747.0	730.9	752.8	776.2	803.4	816.1	850.2	888.4	924.5	977.2	1,036.5	1,064.6	1,104.6	1,154.9	1,194.3
Banking & insurance	"	263.1	269.3	276.0	285.6	296.7	310.5	324.5	338.3	355.3	373.2	397.9	464.4	485.4	514.0	541.2
Communal, social & personal services	"	379.6	385.6	399.7	414.5	429.3	445.1	460.9	481.1	513.2	537.5	552.0	517.9	541.2	556.5	573.1
GDP	Million Quetzales	2,936.1	2,940.2	3,044.4	3,162.9	3,287.6	3,389.5	3,513.7	3,683.6	3,828.2	3,982.7	4,178.7	4,303.4	4,488.7	4,692.8	4,872.4
Economically Active Population																
Agriculture, forestry and fisheries	People	1,302,851	1,344,496	1,387,473	1,431,823	1,477,591	1,524,822	1,575,956	1,628,806	1,683,427	1,739,881	1,798,227	1,858,531	1,917,600	1,971,958	2,002,386
Manufacturing	People	304,970	314,719	324,778	335,160	345,873	356,929	368,899	381,269	394,055	407,270	420,928	435,043	449,930	456,077	469,266
Construction	People	91,940	94,879	97,911	101,041	104,271	107,604	111,212	114,942	118,796	122,780	126,898	131,153	136,608	132,462	141,988
Commerce, banking & insurance	People	163,698	168,931	174,330	179,903	185,653	191,588	198,013	204,653	211,516	218,609	225,940	233,517	242,146	241,469	252,225
Services*	People	269,092	277,693	286,569	295,729	305,182	314,937	325,499	336,414	347,696	359,356	371,407	383,862	397,160	401,574	414,143
Other**	People	109,880	113,391	117,016	120,757	124,616	128,600	132,913	137,370	141,976	146,738	151,658	158,869	163,720	160,552	169,249
TOTAL	People	2,242,431	2,314,109	2,388,077	2,464,413	2,543,186	2,624,480	2,712,492	2,803,454	2,897,466	2,994,634	3,096,058	3,200,975	3,307,164	3,364,092	3,449,257
Estimated Labor Productivity																
Agriculture, forestry and fisheries	Quetzales/ Person	583	560	564	571	570	575	574	572	565	560	561	557	555	556	563
Manufacturing	Quetzales/ Person	1,524	1,487	1,470	1,456	1,443	1,429	1,416	1,415	1,408	1,403	1,401	1,382	1,372	1,398	1,392
Construction	Quetzales/ Person	541	540	600	672	702	626	615	746	700	676	712	711	746	846	840
Commerce, banking & insurance	Quetzales/ Person	6,171	5,921	5,901	5,902	5,926	5,880	5.932	5,994	6,051	6,177	6,349	6,548	6,566	6,911	6,881
GDP	Quetzales/ Person	1,309	1,271	1,275	1,283	1,293	1,291	1,295	1,314	1,321	1,330	1,350	1,344	1,357	1,395	1,413

Note: Labor productivity developments for "services" and "other" cannot be calculated, since it is unclear which economic sub-sectors are covered under these categories.

Source: JICA Study Team computations based on raw data from "Banco de Guatemala" and "Instituto Nacional de Estatistica".

Appendix 6 Employment & unemployment characteristics 1985 to 1999 (values are based on constant 1958 prices)

	Unit	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Formal Employment (absolute)																
Agriculture, forestry and fisheries	People	1,302,851	1,344,496	1,387,473	1,431,823	1,477,591	1,524,822	1,575,956	1,628,806	1,683,427	1,739,881	1,798,227	1,858,531	1,917,600	1,971,958	2,002,386
Manufacturing	People	304,970	314,719	324,778	335,160	345,873	356,929	368,899	381,269	394,055	407,270	420,928	435,043	449,930	456,077	469,266
Construction	People	91,940	94,879	97,911	101,041	104,271	107,604	111,212	114,942	118,796	122,780	126,898	131,153	136,608	132,462	141,988
Commerce, banking & insurance	People	163,698	168,931	174,330	179,903	185,653	191,588	198,013	204,653	211,516	218,609	225,940	233,517	242,146	241,469	252,225
Services*	People	269,092	277,693	286,569	295,729	305,182	314,937	325,499	336,414	347,696	359,356	371,407	383,862	397,160	401,574	414,143
Other**	People	109,880	113,391	117,016	120,757	124,616	128,600	132,913	137,370	141,976	146,738	151,658	158,869	163,720	160,552	169,249
TOTAL	People	2,242,431	2,314,109	2,388,077	2,461,413	2,543,186	2,624,480	2,712,492	2,803,454	2,897,466	2,994,634	3,096,058	3,200,975	3,307,164	3,364,092	3,449,257
Formal Employment (distribution in per cent)																
Agriculture, forestry and fisheries	Per cent	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.0	58.6	58.1
Manufacturing	Per cent	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6
Construction	Per cent	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.9	4.1
Commerce, banking & insurance	*Per cent*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.2*	*7.3*
Services*	Per cent	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.9	12.0
Other**	Per cent	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	5.0	5.0	4.8	4.9
TOTAL	*Per cent*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Implied Employment Growth Rate																
Agriculture, forestry and fisheries	Per cent	n.a.	3.20	3.20	3.20	3.20	3.20	3.35	3.35	3.35	3.35	3.35	3.35	3.18	2.83	1.54
Manufacturing	Per cent	n.a.	3.20	3.20	3.20	3.20	3.20	3.35	3.35	3.35	3.35	3.35	3.35	3.42	1.37	2.89
Construction	Per cent	n.a.	3.20	3.20	3.20	3.20	3.20	3.35	3.35	3.35	3.35	3.35	3.35	4.16	-3.03	7.19
Commerce, banking & insurance	Per cent	n.a.	3.20	3.20	3.20	3.20	3.20	3.35	3.35	3.35	3.35	3.35	3.35	3.70	-0.28	4.45
Services*	Per cent	n.a.	3.20	3.20	3.20	3.20	3.20	3.35	3.35	3.35	3.35	3.35	3.35	3.46	1.11	3.13
Other**	Per cent	n.a.	3.20	3.20	3.20	3.20	3.20	3.35	3.35	3.35	3.35	3.35	4.75	3.05	-1.94	5.42
TOTAL	Per cent	n.a.	3.20	3.20	3.20	3.20	3.20	3.35	3.35	3.35	3.35	3.35	3.42	3.32	1.72	2.53
Statistically Reported 'Under-employment'																
Under-employed	People	800,358	872,037	946,007	1,022,341	1,101,116	1,149,244	1,237,255	1,328,218	1,337,620	1,347,336	1,311,133	1,323,715	1,336,297	1,348,878	n.a.
Open unemployment	People	299,055	298,053	257,517	211,450	162,958	156,448	108,942	42,907	71,845	99,804	110,505	116,604	162,168	199,542	n.a.
Total Under- and Unemployed	People	1,099,413	1,170,090	1,203,524	1,233,791	1,264,074	1,305,692	1,346,197	1,371,125	1,409,465	1,447,140	1,421,638	1,440,319	1,498,465	1,548,420	n.a.
Total 'Theoretical' Labor Force	*People*	*3,341,844*	*3,484,199*	*3,591,601*	*3,696,204*	*3,807,260*	*3,930,172*	*4,058,689*	*4,174,579*	*4,306,931*	*4,441,774*	*4,516,696*	*4,641,294*	*4,806,629*	*4,912,512*	*n.a.*

Source: JICA Study Team computations based on raw data from "Banco de Guatemala" and "Instituto Nacional de Estatistica".

Appendix 7 Population characteristics from the 1981 and 1994 population census results

		1981 Census		1994 Census		2000 Estimation		1981 to 1994		1994 to 2000		1981 to 2000	
	Unit	Number	Percent	Number	Percent	Number	Percent	Implied Growth Rate	Above/ Below Trend	Implied Growth Rate	Above/ Below Trend	Implied Growth Rate	Above/ Below Trend
Absolute population size by Department	People												
Guatemala	"	1,311,192	21.7	1,813,825	21.8	2,578,528	22.6	2.528	above	6.038	above	4.317	above
El Progreso	"	81,188	1.3	108,400	1.3	143,197	1.3	2.248	below	4.749	below	3.032	below
Sacatepequez	"	121,127	2.0	180,647	2.2	259,265	2.3	3.122	above	6.207	above	4.087	above
Chimaltenango	"	230,059	3.8	314,813	3.8	427,601	3.8	2.442	trend	5.236	trend	3.316	trend
Escuintla	"	334,666	5.5	386,534	4.6	483,769	4.2	1.115	below	3.811	below	1.958	below
Santa Rosa	"	194,168	3.2	246,698	3.0	319,814	2.8	1.859	below	4.421	below	2.661	below
Solola	"	154,249	2.5	222,094	2.7	307,791	2.7	2.844	above	5.589	above	3.703	above
Totonicapan	"	204,419	3.4	272,094	3.3	361,301	3.2	2.224	below	4.840	below	3.043	below
Quetzaltenango	"	366,949	6.1	503,857	6.0	678,250	6.0	2.469	trend	5.078	below	3.286	trend
Suchitepequez	"	237,554	3.9	307,187	3.7	403,609	3.5	1.997	below	4.655	below	2.829	below
Retalhuleu	"	150,923	2.5	188,764	2.3	241,921	2.1	1.736	below	4.222	below	2.514	below
San Marcos	"	472,326	7.8	645,418	7.7	844,487	7.4	2.431	trend	4.582	below	3.105	below
Huehuetenango	"	431,343	7.1	634,374	7.6	879,988	7.7	3.012	below	5.606	above	3.824	above
Quiche	"	328,175	5.4	437,669	5.3	588,832	5.2	2.239	below	5.069	below	3.125	below
Baja Verapaz	"	115,602	1.9	155,480	1.9	203,431	1.8	2.306	below	4.582	below	3.019	below
Alta Verapaz	"	322,008	5.3	543,777	6.5	814,301	7.2	4.113	above	6.961	above	5.004	above
Peten	"	131,927	2.2	224,884	2.7	333,390	2.9	4.188	above	6.782	above	5.000	above
Izabal	"	194,618	3.2	253,153	3.0	333,955	2.9	2.043	below	4.725	below	2.883	below
Zacapa	"	115,712	1.9	157,008	1.9	212,794	1.9	2.375	below	5.198	below	3.258	trend
Chiquimula	"	168,863	2.8	230,767	2.8	313,150	2.8	2.432	trend	5.220	trend	3.304	trend
Jalapa	"	136,091	2.2	196,940	2.4	270,055	2.4	2.884	above	5.403	above	3.673	above
Jutiapa	"	251,068	4.1	307,491	3.7	385,909	3.4	1.572	below	3.859	below	2.288	below
Total Population	"	6,054,227	100.0	8,331,874	100.0	11,385,338	100.0	2.487	n.a.	5.342	n.a.	3.380	n.a.

Source: JICA Study Team computations based on "Descripcion De Las Principales Caracteristicas De Poblacion Y Habitacion 1981 & 1994" and year 2000 estimates by the " Instituto Nacional de Estatistica".

Appendix 8 Urban rural split By Department according to 1994 population census results

		1994 Census		Of Which:		Of Which:	
	Unit			Urban		Rural	
		Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
Absolute Population Size by Department	People						
Guatemala	"	1,813,825	21.8	1,285,828	70.9	527,997	29.1
El Progreso	"	108,400	1.3	28,788	26.6	79,612	73.4
Sacatepequez	"	180,647	2.2	127,409	70.5	53,238	29.5
Chimaltenango	"	314,813	3.8	130,855	41.6	183,958	58.4
Escuintla	"	386,534	4.6	143,414	37.1	243,120	62.9
Santa Rosa	"	246,698	3.0	59,377	24.1	187,321	75.9
Solola	"	222,094	2.7	73,856	33.3	148,238	66.7
Totonicapan	"	272,094	3.3	29,188	10.7	242,906	89.3
Quetzaltenango	"	503,857	6.0	200,727	39.8	303,130	60.2
Suchitepequez	"	307,187	3.7	92,784	30.2	214,403	69.8
Retalhuleu	"	188,764	2.3	52,316	27.7	136,448	72.3
San Marcos	"	645,418	7.7	83,890	13.0	561,528	87.0
Huehuetenango	"	634,374	7.6	92,409	14.6	541,965	85.4
Quiche	"	437,669	5.3	66,459	15.2	371,210	84.8
Baja Verapaz	"	155,480	1.9	31,807	20.5	123,673	79.5
Alta Verapaz	"	543,777	6.5	85,875	15.8	457,902	84.2
Peten	"	224,884	2.7	60,115	26.7	164,769	73.3
Izabal	"	253,153	3.0	50,192	19.8	202,961	80.2
Zacapa	"	157,008	1.9	44,892	28.6	112,116	71.4
Chiquimula	"	230,767	2.8	58,305	25.3	172,462	74.7
Jalapa	"	196,940	2.4	53,702	27.3	143,238	72.7
Jutiapa	"	307,491	3.7	62,499	20.3	244,992	79.7
Total Pupulation	"	8,331,874	100.0	2,914,687	35.0	5,417,187	65.0

Source: JICA Study Team computations based on "Descripcion De Las Principales Caracteristicas De Poblacion Y Habitacion 1981 & 1994".

Appendix 9 Urban/ rural & indigenous/non indigenous split by Department according to 1994 population census results

	1994 Census		Of Which:		Of Which:		Of Which Indigenous						Of Which Non-Indigenous						Of Which ' Doesn't Know'					
			Urban		Rural		Urban		Rural		Total		Urban		Rural		Total		Urban		Rural		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Absolute Population Size by Department																								
Guatemala	1,813,825	21.8	1,285,828	70.9	527,997	29.1	109,733	8.5	114,215	21.6	223,948	12.3	1,128,354	87.8	391,585	74.2	1,519,939	83.8	47,741	3.7	22,197	4.2	69,938	3.9
El Progreso	108,400	1.3	28,788	26.6	79,612	73.4	739	2.6	1,488	1.9	2,227	2.1	27,501	95.5	76,705	96.3	104,206	96.1	548	1.9	1,419	1.8	1,967	1.8
Sacatepequez	180,647	2.2	127,409	70.5	53,238	29.5	57,634	45.2	17,584	33.0	75,218	41.6	66,529	52.2	34,671	65.1	101,200	56.0	3,246	2.5	983	1.8	4,229	2.3
Chimal-tenango	314,813	3.8	130,855	41.6	183,958	58.4	91,028	69.6	153,596	83.5	244,624	77.7	37,139	28.4	26,352	14.3	63,491	20.2	2,688	2.1	4,010	2.2	6,698	2.1
Escuintla	386,534	4.6	143,414	37.1	243,120	62.9	10,929	7.6	13,993	5.8	24,922	6.4	128,932	89.9	224,348	92.3	353,280	91.4	3,553	2.5	4,779	2.0	8,332	2.2
Santa Rosa	246,698	3.0	59,377	24.1	187,321	75.9	1,823	3.1	4,642	2.5	6,465	2.6	56,207	94.7	177,604	94.8	233,811	94.8	1,347	2.3	5,075	2.7	6,422	2.6
Solola	222,094	2.7	73,656	33.3	148,238	66.7	65,353	88.5	142,574	96.2	207,927	93.6	7,260	9.8	3,312	2.2	10,572	4.8	1,243	1.7	2,352	1.6	3,596	1.6
Totonicapan	272,094	3.3	29,188	10.7	242,906	89.3	24,423	83.7	232,700	95.8	257,123	94.5	3,982	13.6	4,192	1.7	8,174	3.0	783	2.7	6,014	2.5	6,797	2.5
Quetzal-tenango	503,857	6.0	200,727	39.8	303,130	60.2	94.792	47.2	205,323	67.7	300,115	59.6	102,066	50.8	91,982	30.3	194,048	38.5	3,869	1.9	5,825	1.9	9,694	1.9
Suchitepequez	307,187	3.7	92,784	30.2	214,403	69.8	37,467	40.4	138,767	64.7	176,234	57.4	53,982	58.2	73,234	34.2	127,216	41.4	1,335	1.4	2,402	1.1	3,737	1.2
Retalhuleu	188,764	2.3	52,316	27.7	136,448	72.3	12,026	23.0	50,782	37.2	62,808	33.3	39,120	74.8	82,726	60.6	121,846	64.5	1,170	2.2	2,940	2.2	4,110	2.2
San Marcos	645,418	7.7	83,890	13.0	561,528	87.0	14,305	17.1	259,793	46.3	274,098	42.5	67,185	80.1	288,191	51.3	355,376	55.1	2,400	2.9	13,544	2.4	15,944	2.5
Huehue-tenango	634,374	7.6	92,409	14.6	541,965	85.4	45,053	48.8	359,834	66.4	404,887	63.8	44,560	48.2	164,929	30.4	209,489	33.0	2,796	3.0	17,202	3.2	19,998	3.2
Quiche	437,669	5.3	66,459	15.2	371,210	84.8	42,580	64.1	322,426	86.9	365,006	83.4	22,037	33.2	38,256	10.3	60,293	13.8	1,842	2.8	10,523	2.8	12,370	2.8
Baja Verapaz	155,480	1.9	31,807	20.5	123,873	79.5	13,038	41.0	73,178	59.2	86,216	55.5	18,223	57.3	48,196	39.0	66,419	42.7	546	1.7	2,299	1.9	2,845	1.8
Alta Verapaz	543,777	6.5	85,875	15.8	457,902	84.2	55,723	64.9	428,025	93.5	483,748	89.0	28,603	33.3	20,726	4.5	49,329	9.1	1,549	1.8	9,151	2.0	10,700	2.0
Peten	224,884	2.7	60,115	26.7	164,769	73.3	6,140	10.2	52,860	32.1	59,000	26.2	52,438	87.2	107,640	65.3	160,078	71.2	1,537	2.6	4,269	2.6	5,806	2.6
Izabal	253,153	3.0	50,192	19.8	202,961	80.2	8,735	17.4	49,011	24.1	57,746	22.8	40,357	80.4	150,062	73.9	190,419	75.2	1,100	2.2	3,888	1.9	4,988	2.0
Zacapa	157,008	1.9	44,892	28.6	112,116	71.4	1,163	2.6	5,736	5.1	6,899	4.4	43,009	95.8	104,715	93.4	147,724	94.1	720	1.6	1,665	1.5	2,385	1.5
Chiquimula	230,767	2.8	58,305	25.3	172,462	74.7	4,613	7.9	63,541	36.8	68,154	29.5	52,385	89.8	105,742	61.3	158,127	68.5	1,307	2.2	3,179	1.8	4,486	1.9
Jalapa	196,940	2.4	53,702	27.3	143,238	72.7	13,433	25.0	60,300	42.1	73,733	37.4	39,103	72.8	79,004	55.2	118,107	60.0	1,160	2.2	3,934	2.7	5,100	2.6
Jutiapa	307,491	3.7	62,499	20.3	244,992	79.7	2,958	4.7	12,628	5.2	15,586	5.1	58,019	92.8	226,217	92.3	284,236	92.4	1,522	2.4	6,147	2.5	7,669	2.5
Total pupulation	8,331,874	100.0	2.914,687	35.0	5,417,187	65.0	713.668	24.5	2,762,996	51.0	3,476,684	41.7	2,116,991	72.6	2,520,389	46.5	4,637,380	55.7	84,008	2.9	133,802	2.5	217,810	2.6

Source: JICA Study Team computations based on "Descripcion De Las Principales Caracteristicas De Poblacion Y Habitacion 1981 & 1994".

Appendix 10 National level formal sector employment, unemployment and underemployment 1985 to 1999

Year	Enumerated population size	Formal Sector Employment							Of which	Open	Under	TOTAL	Participation ratio formal sector	IGSS coverage ratio	Un/Under-employment ratio	Under-employment ratio
		Agriculture & fisheries	Manufacturing	Construction	Trade & fin. services	Services	Other	TOTAL	Associated with IGSS	Unemployment	Employment					
1985	6,677,429	1,302,851	304,970	91,940	163,698	269,092	109,880	2,242,431	631,654	299,055	800,358	1,099,413	33.58	28.17	49.03	35.69
1986	6,843,697	1,344,496	314,719	94,879	168,931	277,693	113,391	2,314,109	660,444	298,053	872,037	1,170,090	33.81	28.54	50.56	37.68
1987	7,014,105	1,387,473	324,778	97,911	174,330	286,569	117,016	2,388,077	678,995	257,517	946,007	1,203,524	34.05	28.43	50.40	39.61
1988	7,188,756	1,431,823	335,160	101,041	179,903	295,729	120,757	2,464,413	779,560	211,450	1,022,341	1,233,791	34.28	31.63	50.06	41.48
1989	7,367,756	1,477,591	345,873	104,271	185,653	305,182	124,616	2,543,186	788,367	162,958	1,101,116	1,264,074	34.52	31.00	49.70	43.30
1990	7,551,213	1,524,822	356,929	107,604	191,588	314,937	128,600	2,624,480	785,753	156,448	1,149,244	1,305,692	34.76	29.94	49.75	43.79
1991	7,739,238	1,575,956	368,899	111,212	198,013	325,499	132,913	2,712,492	786,903	108,942	1,237,255	1,346,197	35.05	29.01	49.63	45.61
1992	7,931,945	1,628,806	381,269	114,942	204,653	336,414	137,370	2,803,454	795,708	42,907	1,328,218	1,371,125	35.34	28.38	48.91	47.38
1993	8,129,451	1,683,427	394,055	118,796	211,516	347,696	141,976	2,897,466	823,239	71,845	1,337,620	1,409,465	35.64	28.41	48.64	46.17
1994	8,331,874	1,739,881	407,270	122,780	218,609	359,356	146,738	2,994,634	830,324	99,804	1,347,336	1,447,140	35.94	27.73	48.32	44.99
1995	8,776,796	1,793,881	420,928	126,898	225,940	371,407	151,658	3,090,712	855,596	110,505	1,311,133	1,421,638	35.21	27.68	46.00	42.42
1996	9,245,477	1,858,531	435,043	131,153	233,517	383,862	158,869	3,200,975	852,243	116,604	1,323,715	1,440,319	34.62	26.62	45.00	41.35
1997	9,739,185	1,917,600	449,930	136,608	242,146	397,160	163,720	3,307,164	851,292	162,168	1,336,297	1,498,465	33.96	25.74	45.31	40.41
1998	10,259,238	1,971,958	456,077	132,462	241,469	401,574	160,552	3,364,092	887,228	199,542	1,348,878	1,548,420	32.79	26.37	46.03	40.10
1999	10,807,102	2,002,386	469,266	141,988	252,225	414,143	169,249	3,449,257	n.a.	n.a.	n.a.	n.a.	31.92	n.a.	n.a.	n.a.

Note: 1) IGSS = Instituto Guatemalteco de Seguridad Social.
2) n.a. = not available.

Source: JICA Study Team compilation from "Guatemala en Cifras"; Global Info Group.

Appendix 11 Estimated population size 2000, theoretical labor force and employment by Department and major economic sub-sectors

Department	Total Population Size 2000	Of which: 15 - 64 years (estim.)	Estimated Formal Sector Employment														Implied Total Formal Sector Employment		Implied Open Un-employment	Implied Open Under-employment	Implied "Infor-mal Labor Force"
			Agriculture		Industry		Construction		Trade		Services		Public Adminis-tration		Un-deter-mined						
			Absol.	%	Absol.	%	Absol.	%	Absol.	%	Absol.	%	Absol.	%	Absol.	%	Absol.	%			
Development Region I:																					
Guatemala	2,578,528	1,864,276	179,466	23.2	194,163	25.1	122,996	15.9	80,450	10.4	166,315	21.5	26,301	3.4	3,868	0.5	773,558	100.0	48,471	326,248	715,998
Development Region II:																					
Alta Verapaz	814,301	588,740	218,396	89.4	4,397	1.8	3,420	1.4	6,352	2.6	6,107	2.5	3,664	1.5	1,954	0.8	244,290	100.0	15,307	103,029	226,113
Baja Verapaz	203,431	147,081	52,302	85.7	1,526	2.5	1,831	3.0	1,709	2.8	1,953	3.2	1,709	2.8	0	0.0	61,029	100.0	3,824	25,739	56,488
Development Region III:																					
El Progreso	143,197	103,531	31,145	72.5	3,952	9.2	2,062	4.8	1,847	4.3	2,621	6.1	1,031	2.4	301	0.7	42,959	100.0	2,692	18,118	39,763
Izabal	333,956	241,449	76,743	76.6	3,306	3.3	3,206	3.2	6,412	6.4	4,809	4.8	4,609	4.6	1,102	1.1	100,187	100.0	6,278	42,254	92,732
Zacapa	212,794	153,850	48,709	76.3	3,064	4.8	2,554	4.0	3,383	5.3	4,086	6.4	1,724	2.7	319	0.5	63,838	100.0	4,000	26,924	59,088
Chiquimula	313,150	226,407	83,329	88.7	1,409	1.5	2,630	2.8	2,255	2.4	2,724	2.9	1,409	1.5	1,879	0.2	95,636	100.0	5,887	39,621	85,264
Development Region IV:																					
Santa Rosa	*319,814*	*231,226*	*81,361*	*84.8*	*2,686*	*2.8*	*4,701*	*4.9*	*2,207*	*2.3*	*3,838*	*4.0*	*768*	*0.8*	*3,838*	*0.4*	*99,398*	*100.0*	*6,012*	*40,464*	*85,351*
Jalapa	270,055	195,250	73,239	90.4	1,134	1.4	2,430	3.0	1,053	1.3	2,512	3.1	567	0.7	810	0.1	81,746	100.0	5,076	34,169	74,259
Jutiapa	365,909	279,012	102,227	88.3	1,737	1.5	3,242	2.8	2,431	2.1	3,589	3.1	2,200	1.9	3,473	0.3	118,899	100.0	7,254	48,827	104,032
Development Region V:																					
Sacatepequez	259,265	187,449	34,690	44.6	16,723	21.5	8,945	11.5	5,211	6.7	10,422	13.4	1,400	1.8	3,889	0.5	81,280	100.0	4,874	32,804	68,492
Chimaltenango	427,601	309,156	109,167	85.1	6,414	5.0	4,746	3.7	2,052	1.6	4,233	3.3	1,026	0.8	6,414	0.5	134,053	100.0	8,038	54,102	112,962
Excuintla	*483,769*	*349,765*	*101,156*	*69.7*	*15,674*	*10.8*	*7,982*	*5.5*	*6,966*	*4.8*	*10,449*	*7.2*	*1,887*	*1.3*	*10,159*	*0.7*	*154,274*	*100.0*	*9,094*	*61,209*	*125,188*
Development Region VI:																					
Solola	307,791	222,533	73,316	79.4	7,387	8.0	2,678	2.9	3,971	4.3	3,786	4.1	831	0.9	3,693	0.4	95,661	100.0	5,786	38,943	82,142
Totonicapan	361,301	261,221	44,223	40.8	31,975	29.5	3,143	2.9	22,545	20.8	5,311	4.9	542	0.5	650	0.6	108,390	100.0	6,792	45,714	100,325
Quetzaltenango	678,250	490,375	154,844	76.1	16,685	8.2	10,591	5.2	8,953	4.4	9,360	4.6	2,035	1.0	1,017	0.5	203,475	100.0	12,750	85,816	188,334
Suchitepequez	403,609	291,809	92,870	76.7	9,202	7.6	4,480	3.7	5,085	4.2	6,781	5.6	1,574	1.3	10,897	0.9	130,890	100.0	7,587	51,067	102,265
Retalhuleu	241,921	174,909	57,045	78.6	3,556	4.9	3,193	4.4	2,830	3.9	4,355	6	943	1.3	6,532	0.9	78,455	100.0	4,548	30,609	61,297
San Marcos	844,487	610,564	218,638	86.3	7,600	3.0	6,840	2.7	7,347	2.9	8,360	3.3	2,533	1.0	2,027	0.8	253,346	100.0	15,875	106,849	234,495
Development Region VII:																					
Huehuetenango	*879,988*	*636,231*	*225,453*																		*227,721*
Quiche	588,832	425,726	145,206	82.2	9,539	5.4	3,180	1.8	9,166	5.2	6,006	3.4	1,590	0.9	1,943	1.1	176,650	100.0	11,069	74,502	163,505
Development Region VIII:																					
Peten	333,390	241,041	93,116	93.1	9,002	0.9	9,002	0.9	1,600	1.6	2,300	2.3	800	0.8	400	0.4	116,220	100.0	6,267	42,182	76,372
Total	11,385,338	8,231,599	2,296,640	n.a.	360,636	n.a.	222,554	n.a.	190,182	n.a.	279,157	n.a.	62,047	n.a.	83,646	n.a.	3,494,862	n.a.	214,022	1,440,530	3,082,186

Note: 1) The total population size for the year 2000 is according to INE's estimates, which are based on 1994 census enumeration error corrected projections.
2) *The number of employees has been estimated using a 32 percent participation rate* across all Departments.
3) Open unemployment has been estimated at 2.6 percent and open under-employment at 17.5 percent of the theoretical labor force.
4) *The implied informal labor force* has been estimated as the balance between theoretical labor force minus formal sector employment, and minus open un- and under-employment.
5) n.a. = not applicable.

Source: JICA Study Team

Appendix 12 Budget revenues and revenue composition 1991 to 2001

Parameter	Unit	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP (nominal) BUDGET	Million Quetzales	47,302	53,986	64,243	74,572	85,157	95,479	107,873	121,127	133,737	146,489	164,068
1) Revenues of which	Million Quetzales	5,516	6,463	7,946	8,016	9,560	11,107	13,841	16,403	19,403	22,310	22,781
Taxes	Million Quetzales	2,581	3,324	5,500	5,580	6,929	8,665	9,512	11,633	13,944	15,621	16,741
Non-tax	Million Quetzales	1,406	1,721	1,200	1,203	701	914	830	1,408	1,545	1,549	2,243
Capital	Million Quetzales	0	0	0	0	355	40	1,667	870	26	1,150	1,490
Financing	Million Quetzales	1,529	1,419	1,246	1,233	1,575	1,488	1,831	2,492	3,887	3,991	2,307
2) Revenues of which	in % of GDP	11.66	11.97	12.37	10.75	11.23	11.63	12.83	13.54	14.51	15.23	13.88
Taxes	in % of GDP	5.46	6.16	8.56	7.48	8.14	9.08	8.82	9.60	10.43	10.66	10.20
Non-tax	in % of GDP	2.97	3.19	1.87	1.61	0.82	0.96	0.77	1.16	1.16	1.06	1.37
Capital	in % of GDP	0.00	0.00	0.00	0.00	0.42	0.04	1.55	0.72	0.02	0.78	0.91
Financing	in % of GDP	3.23	2.63	1.94	1.65	1.85	1.56	1.70	2.06	2.91	2.72	1.41
3) Revenues by source:	in %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Taxes	in % of Revenues	46.79	51.42	69.22	69.61	72.48	78.02	68.72	70.92	71.87	70.02	73.49
Non-tax	in % of Revenues	25.49	26.62	15.10	15.01	7.34	8.23	6.00	8.58	7.96	6.94	9.85
Capital	in % of Revenues	0.00	0.00	0.00	0.00	3.71	0.36	12.05	5.30	0.14	5.15	6.54
Financing	in % of Revenues	27.72	21.95	15.68	15.38	16.48	13.40	13.23	15.19	20.04	17.89	10.12

Note: GDP figures for the years 1999, 2000 and 2001 are preliminary.

Source: JICA Study Team based on data provided by the Ministry of Finance.

Appendix 13 Budget allocation for central government entities as percent of total budget 1991 to 2001 - part 2

Parameter	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
BUDGET ALLOCATION											
The Legislature	0.3	0.6	1.0	1.0	0.7	0.7	0.6	0.8	0.0	0.0	0.0
The Presidency	2.3	3.2	5.0	4.9	8.2	7.6	0.8	0.6	0.3	0.2	0.5
External Relations	0.9	0.9	1.1	1.1	1.6	1.5	1.1	1.0	0.9	0.9	1.0
Governing	2.9	3.2	3.0	3.0	4.3	3.8	4.3	4.8	5.6	5.2	5.7
National Defense	8.1	8.7	8.0	7.9	7.9	6.9	5.3	4.9	4.4	4.1	3.7
Public Finances	47.3	43.3	36.2	36.7	36.3	38.5	2.0	1.8	1.3	0.9	0.9
Education	11.1	12.2	14.3	14.2	14.9	14.0	10.3	10.9	11.6	12.1	12.3
Public Health & Social Assistance	9.0	8.3	8.8	8.7	9.3	10.6	8.8	7.5	6.4	6.1	7.3
Work & related Social Provisions	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3
Agriculture, Husbandry & food	4.1	3.2	4.1	4.1	3.5	3.0	2.1	2.3	2.9	2.8	3.7
Communications, Telecom., Housing	9.1	10.6	14.2	14.1	11.2	11.0	8.9	11.8	11.5	11.6	10.0
Energy & Mines	0.7	1.0	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2
Secretariats depending on the exec.	0.0	0.0	0.0	0.0	0.0	0.0	7.1	8.7	9.7	9.5	10.7
State Obligations to MOF	0.0	0.0	0.0	0.0	0.0	0.0	28.0	29.1	32.0	30.1	26.5
Service of Public Debts	0.0	0.0	0.0	0.0	0.0	0.0	18.6	13.7	11.2	14.2	15.5
General Audit	0.2	0.2	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3
General National Procurement Office	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.1	1.0
Urban & Rural Development	0.5	1.2	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ministry of the Public	0.1	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Special Matters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-total	96.9	97.1	98.8	98.8	98.8	98.7	98.7	98.8	98.5	98.6	99.4
Unidentified	3.1	2.9	1.2	1.2	1.2	1.3	1.3	1.2	1.5	1.4	0.6
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: GDP figures for the years 1999, 2000 and 2001 are preliminary.

Source: JICA Study Team based on data provided by the Ministry of Finance.

Appendix 14 Road network by surface type, region & department in 2000

Region	Total km per Region	Type of Pavement/Surface Asphalt	Earth	Rural Roads	Department	Total km per Region	Type of Pavement/Surface Asphalt	Earth	Rural Roads
Region I (Metropolitan)	794.00	482.00	270.00	42.00	Guatemala	794.00	482.00	270.00	42.00
Region II (North)	1,525.76	170.00	989.00	366.76	Alta Verapaz	1,063.76	78.00	762.00	223.76
					Baja Verapaz	462.00	92.00	227.00	143.00
Region III (North-east)	1,783.00	904.00	731.00	148.00	Chiquimula	618.00	245.00	245.00	128.00
					El Progreso	248.00	178.00	58.00	12.00
					Izabal	438.00	255.00	183.00	0.00
					Zacapa	479.00	226.00	245.00	8.00
Region IV (South-east)	1,906.30	678.00	661.00	567.30	Jalapa	624.50	88.00	198.00	338.50
					Jutiapa	648.60	349.00	211.00	88.60
					Santa Rosa	633.20	241.00	252.00	140.20
Region V (Central)	1,718.40	718.00	647.00	353.40	Chimaltenango	741.40	176.00	212.00	353.40
					Escuintla	821.00	436.00	385.00	0.00
					Sacatepequez	156.00	206.00	50.00	0.00
Region VI (South-west)	3,445.46	1,334.00	1,216.00	895.46	Quetzaltenango	631.00	280.00	170.00	181.00
					Retalhuleu	222.00	168.00	54.00	0.00
					San Marcos	1,020.46	260.00	498.00	262.46
					Solola	410.00	212.00	99.00	99.00
					Suchitepequez	577.00	316.00	261.00	0.00
					Totonicapan	585.00	98.00	134.00	353.00
Region VII (North-west)	2,064.00	312.62	931.38	820.00	El Quiche	958.00	117.00	434.00	407.00
					Huehuetenango	1,106.00	195.62	497.38	413.00
Region VIII (Peten)	1,033.00	378.00	655.00	0.00	Peten	1,033.00	378.00	655.00	0.00

Source: JICA Study Team based on data provided by MICIVI

Appendix 15 Road network by classification and surface type by Department in 2000

		National Level Roads		Departmental Roads			Central American Roads	
Department	Total km	Asphalt	Earth	Asphalt	Earth	Rural Roads	Asphalt	Earth
Guatemala	794.00	50.00	63.00	255.00	207.00	42.00	177.00	0.00
Alta Verapaz	1,063.76	14.00	217.00	25.00	545.00	223.76	39.00	0.00
Baja Verapaz	462.00	27.00	71.00	12.00	156.00	143.00	53.00	0.00
Chiquimula	618.00	0.00	77.00	101.00	168.00	128.00	144.00	0.00
El Progreso	248.00	25.00	0.00	35.00	58.00	12.00	118.00	0.00
Izabal	438.00	12.00	73.00	30.00	110.00	0.00	213.00	0.00
Zacapa	479.00	21.00	2.00	100.00	243.00	8.00	105.00	0.00
Jalapa	624.50	74.00	87.00	14.00	111.00	338.50	0.00	0.00
Jutiapa	648.60	36.00	23.00	157.00	188.00	88.60	156.00	0.00
Santa Rosa	633.20	38.00	16.00	115.00	236.00	140.20	88.00	0.00
Chimaltenango	741.40	42.00	34.00	71.00	178.00	353.40	63.00	0.00
Escuintla	821.00	54.00	6.00	124.00	379.00	0.00	258.00	0.00
Sacatepequez	156.00	48.00	26.00	26.00	24.00	0.00	32.00	0.00
Quetzaltenango	631.00	122.00	28.00	100.00	142.00	181.00	58.00	0.00
Retalhuleu	222.00	71.00	0.00	69.00	54.00	0.00	28.00	0.00
San Marcos	1,020.46	124.00	191.00	82.00	307.00	262.46	54.00	0.00
Solola	410.00	86.00	10.00	73.00	89.00	99.00	53.00	0.00
Suchitepequez	577.00	31.00	0.00	212.00	261.00	0.00	73.00	0.00
Totonicapan	585.00	15.00	42.00	22.00	92.00	353.00	61.00	0.00
El Quiche	958.00	44.00	130.00	65.00	304.00	407.00	8.00	0.00
Huehuetenango	1,106.00	41.00	213.00	53.62	284.38	413.00	101.00	0.00
Peten	1,033.00	0.00	0.00	136.00	633.00	0.00	242.00	22.00
Total Country	14,269.92	975.00	1,309.00	1,877.62	4,769.38	3,192.92	2,124.00	22.00

Source: JICA Study Team based on data provided by the Ministry of Communication, Infrastructure & Housing.

Appendix 16 Road network by classification, region & Department in 2000

Region	Total km per Region	Classification			Rural Roads	Department	Total km per Region	Classification			Rural Roads
		CA	RN	RD				CA	RN	RD	
Region I (Metropolitan)	794.00	177.00	113.00	462.00	42.00	Guatemala	794.00	177.00	113.00	462.00	42.00
Region II (North)	1,525.76	92.00	329.00	738.00	366.76	Alta Verapaz	1,063.76	39.00	231.00	570.00	223.76
						Baja Verapaz	462.00	53.00	98.00	168.00	143.00
Region III (North-east)	1,783.00	580.00	210.00	845.00	148.00	Chiquimula	618.00	144.00	77.00	269.00	128.00
						El Progreso	248.00	118.00	25.00	93.00	12.00
						Izabal	438.00	213.00	85.00	140.00	0.00
						Zacapa	479.00	105.00	23.00	343.00	8.00
Region IV (South-east)	1,906.30	244.00	274.00	821.00	567.30	Jalapa	624.50	0.00	161.00	125.00	338.50
						Jutiapa	648.60	156.00	59.00	345.00	88.60
						Santa Rosa	633.20	88.00	54.00	351.00	140.20
Region V (Central)	1,718.40	353.00	210.00	802.00	353.40	Chimaltenango	741.40	63.00	76.00	249.00	353.40
						Escuintla	821.00	258.00	60.00	503.00	0.00
						Sacatepequez	156.00	32.00	74.00	50.00	0.00
Region VI (South-west)	3,445.46	327.00	720.00	1,503.00	895.46	Quetzaltenango	631.00	58.00	150.00	242.00	181.00
						Retalhuleu	222.00	28.00	71.00	123.00	0.00
						San Marcos	1,020.46	54.00	315.00	389.00	262.46
						Sololá	410.00	53.00	96.00	162.00	99.00
						Suchitepequez	577.00	73.00	31.00	473.00	0.00
						Totonicapan	585.00	61.00	57.00	114.00	353.00
Region VII (North-west)	2,064.00	109.00	428.00	707.00	820.00	El Quiche	958.00	8.00	174.00	369.00	407.00
						Huehuetenango	1,106.00	101.00	254.00	338.00	413.00
Region VIII (Peten)	1,033.00	264.00	0.00	769.00	0.00	Peten	1,033.00	264.00	0.00	769.00	0.00

Note: CA = Central American roads; RN = National Level roads; RD = Departmental Level roads.

Source: JICA Study Team based on data provided by the Ministry of Communication, Infrastructure & Housing.