(2) Replacing Costs

After the construction of the short-term facilities, the following costs will be incurred every 15 years (First year 2010) in replacing air navigation equipment which accounts for 70% of the construction cost of the air navigation systems work in the short-term development.

Table 15.2.2 Replacing Costs

	. :	:		(1,000 Colones)
ltem	Foreign	Costa Rica	an Currency	Total
	Currency	Financial	Economic	
Replacing Cost in 2010	215,490	7,398	6,658	222,148

(3) Operation and Maintenance Costs

Operation and maintenance costs include personnel cost and material and equipment costs.

a) Personnel Cost

As described in Section 13.4, Additional Airport Staff, operation and maintenance staff of Juan Santamaria Airport will be increased to meet with the airport facilities developed for the short-term requirement.

The total number of airport staff is estimated to be 262 persons from the present 205 persons, i.e. additional 57 staff.

Additional personnel costs required for the development of Juan Santamaria Airport is calculated by multiplying the number of additional staff by an average salary at Juan Santamaria Airport (56,600 colones/month including general administration cost) as shown in Table 15.2.3.

Figure 15.2.3 Additional Personnel Cost

Year	Number of	Cost per Person	Annual	Annual
	Additional Staff	per Month	Financial Cost	Economic Cost
	(Persons)	(Colones)	(1,000 Colones)	(1,000 Colones)
1996 ~ 2015	57	56,600	38,700	34,800

b) Material and Equipment Costs

The additional material and equipment costs required for the operations and maintenance of the facilities in the short-term development are estimated by the following method and shown in Table 15.2.4.

Civil and Building

Facilities

1% of construction cost for civil and

architectural works

Equipment

: 5% of equipment cost for air navigation

systems and airport utilities

Table 15.2.4 Annual Costs for Material and Equipment

(Unit: 1,000 Colones)

			<u></u>	July 1'000 Coloues
item	Foreign	Costa Ric	can Currency	Total
	Currency	Financial	Economic	Economic Cost
Civil and Buildings	33,917	12,969	11,672	45,589
Equipment	41,045	4,659	4,193	45,238
			Grand Total	90,827

15.2.3 Project Benefits

(1) Benefits to be Quantified

The development of Juan Santamaria Airport will offer various benefits to the national and regional economies. In this Study, the following economic benefits were quantified and evaluated:

- (a) Benefit due to accommodation of the overflow of foreign passengers
- (b) Benefit of increasing foreign earnings from foreign visitors
- (c) Benefit due to increase of LACSA'S revenue
- (d) Time saving benefits to Costa Rican passengers
- (e) Benefit due to accommodation of the overflow of export cargo
- (f) Benefit due to the increase of employment by construction work

(2) Definition of "Without Project Case"

This Project is designed to expand the air transport services at Juan Santamaria Airport by redeveloping the existing airport. Hence the "without project case" is specified as the maintenance of the existing airport in the present condition with minimum maintenance and replacement.

In the "without project case", it is next necessary to determine the capacity of the existing Juan Santamaria Airport at the present condition. The existing international and domestic passenger terminal buildings, and cargo terminal buildings have already reached their capacities as evaluated in Section 6.2. Therefore it is assumed that in the "without project case", the traffic will remain constant at the present level (1990).

The overflow of traffic which cannot be accommodated in the "without project case" is estimated as the difference between future air traffic demand in the "with project case" and the existing airport capacity, i.e. the present traffic volume.

(3) Definition of "With Project Case"

Since these economic and financial analyses are carried out for the evaluation of the short-term development project, the economic benefit and financial revenues generated by the long-term development project will not be considered in this estimation.

Therefore, the air traffic demand in the "With Project Case" will not exceed the capacity of airport facilities developed by the short-term development of which the design target year is 2000.

Therefore, in the estimation of demand "With Project Case", passenger and cargo demand are assumed to reach their limit in the year 2000 and to continue at the same volume after the year 2000.

The future traffic demand, incremental traffic in "With Project" and "Without Project" traffic are presented in Table 15.2.5.

(4) Estimation of Project Benefits

a) Benefits due to Accommodation of the Overflow of Foreign Passengers

The airport operation revenue such as aircraft landing charge, navaid charge, airport tax from passengers etc. will increase by the accommodation of the overflow of passengers. The incremental revenue by foreign passengers will be accounted for as a benefit by the project, but the revenue by Costa Rican passengers should not be accounted because it is a transfer portion. This benefit is quantified by the equation 15.2.1.

 $BAPt = RTt (ATAX \times CONV + BSGP) - (15.2.1)$

where,

BAPt ; Benefits in the year t due to accommodating the overflowed foreign

passenger

RTt ; Incremental foreign passengers in year t

(= 0.61 x (International Passenger))

ATAX : Airport tax for departing foreign passenger in 1991 (= 574 Colones)

CONV : Conversion factor from two-way to one-way (= 1/2)

BSGP ; Operating revenue of the Airport per passenger (= 370 Colones)

BSGP is obtained by equation 15.2.2

BSGP = TTRE x JSRE x PACO x SHAP/JSPA ---- (15.2.2)

where,

TTRE ; DGAC income received from all related airlines in 1990. The

breakdown is shown in Appendix 13.3.1 (= 326,027,000 Colones)

JSRE ; Share of Juan Santamaria Airport of the total operating revenue of

DGAC in 1991 (= 0.9)

PACO: Price escalation factor to convert from 1990 price to 1991 price,

informed by Banco Central (= 1.264)

SHPA; The portion of operating revenue allocated to passengers (= 0.92).

This ratio is estimated by the following procedure:

In 1991, the passenger fare between Miami and Juan Santamaria was US\$400 on an average, and the freight charge per ton was US\$580 on an average. Therefore, one ton of cargo is equivalent to 1.45 pax. In 1990, the international pax was 923,000 and the international cargo was 67,000tons. The 67,000tons cargo is equal to 97,000pax (= $67,000 \times 1.45$). Therefore, the total pax is 1,020,000 pax (= 923,000 + 97,000), hence the cost and revenue could be allocated between pax and freight by 92% and 8% respectively.

JSPA; Annual passenger volume in 1990 (= 923,000 persons)

The benefits due to accommodation of the overflow of foreign passengers is shown in Table 15.2.6.

Table 15.2.5 Traffic Volume in Case of "Without the Project" and "With the Project"

1990 1983 1994 1995 1996 1997 1998 1999 2000 2001	1997 1998 338,800 1,452,400 123,960 128,940 42,550 1,581,396 46,817 51,138 116,530 132,816 116,530 132,816 48,517 51,138 48,817 51,138 48,817 51,138 48,817 51,138 48,817 51,138 48,817 51,138 48,817 51,138	1998 1999 2000 452,400 1,546,200 1,640,000 126,940 133,920 138,900	2000	2001 20	2002 2003	73 2004	2005	2006	2007	2008	5003	2010 2	2011 20	2012 2013	3 2014	2015
Passengers(Persons) -International 922,969 1,071,788 1,121,394 1,171,000 1,264,900 1,338 -Domestic 64,778 94,311 104,156 114,000 1,264,900 1,338 -Domestic 64,778 94,311 104,156 114,000 1,264,900 1,338 -Cargo (10ns) -International 66,903 1,00,440 111,065 122,131 1,42,739 153 Import 25,120 32,953 35,564 38,175 42,496 46 -Domestic 279 461 521 83,964 38,175 42,496 46 -Domestic 7,182 100,501 111,507 122,713 1,43,347 153 Taxenmentonal 148,819 196,425 248,031 341,831 453 -International 178,382 237,802 297,223 36,033 49 -International 178,382 237,802 297,223 36,033 49 -International 38,137 44,182 55,228 75,836 99 -International 38,331 44,425 55,531 76,165 99 -International 32,599 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,999 922,	356,600 1,452, 123,960 1,581, 46,817 51, 116,530 132, 163,347 183, 46,817 51, 165,530 132, 465,631 529,	400 1,546,200 940 133,920														
Passengers(Persons)	358,600 1,452, 123,960 128, 42,550 1,581, 163,347 183, 116,530 132, 183,980 184, 485,631 529,	400 1,546,200 940 133,920														
Tricker 177, 100 1,265 1,071,788 1,121,394 1,171,000 1,383,780 1,385 1,041,58 1,141,190 1,141,99 1,225,549 1,265,000 1,383,780 1,482 1,265,000 1,383,780 1,482 1,265,000 1,383,780 1,482 1,265,000 1,383,780 1,482 1,265,000 1,383,780 1,482 1,285,000 1,383,780 1,482 1,282 1,285,000 1,383,780 1,482 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,282 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1,283 1	358,800 1,452, 123,960 1,581, 48,817 183, 46,817 51, 116,530 132, 633 153,980 184, 485,631 523,	400 1,546,200 940 133,920													:	
-Domestic 64,778 94,311 104,156 114,000 118,380 123 -Total 887,747 1,166,099 1,225,549 1,265,000 1,383,780 1,482 -Infrarent formal 66,903 100,040 111,085 122,131 142,739 163 -Infrarent formal 25,120 22,953 35,564 38,175 42,496 46 -Domestic 279 461 521 522 83,966 100,246 116 -Domestic 279 461 521 522 64024 115 -Infrarent formal 67,182 100,501 111,507 122,713 143,347 163 -Infrarent formal 178,352 237,802 237,223 396,033 494 -Domestic 28,533 39,378 42,123 39,038 494 -Domestic 28,304 33,738 42,173 59,460 71 -Domestic 38,313 44,425 55,531 76,155 99 -Infrarent formal 33,319 44,425 55,531 76,155 99 -Domestic 33,319 44,425 55,531 76,155 99 -Domestic 44,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,778 64,	482,560 1,581, 482,547 1,581, 46,817 51, 116,530 132, 183,380 184, 485,631 529,	940 133,920	1,546,200 1,640,000 1	1,640,000 1,64	1,640,000 1,640,000	000,009,1 000,	000,049,1 0	1,640,000	1,640,000 1	1,640,000 1	1,640,000 1,6	1,640,000 1,6	,640,000 1,640	,640,000 1,640,000	00 1,540,000	1,640,000
-Total 897,747 1,166,089 1,225,549 1,285,000 1,383,780 1,482 -3argo (tons) -International 66,903 100,040 111,085 122,131 142,739 163 -International 25,120 32,953 35,564 38,175 42,496 46 -Domestic 279 461 521 582,956 100,245 116 -Total 1738 67,087 75,521 83,956 100,245 116 -Total 178,812 100,501 111,507 122,713 143,347 163 -Dassengers(Persons) -International 148,819 196,425 248,031 341,831 455 -Total 38,137 44,182 55,228 75,836 92 -Total 38,331 44,425 55,531 76,155 9 Without Project Traffic - 28,394 32,786 42,173 58,460 71 - 28,394 32,786 42,173 58,460 71 - 28,394 32,396 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,989 922,	482,560 1,581, 163,347 183, 46,817 51, 116,580 132, 183,380 184, 485,631 529,		138,900	138,900 13	138,900 138	138,900 138,900	138,900	138,900	138,900	138,900	138,900	138,900	138,900 130	138,900 138,900	00 138,900	138,900
111,085 122,131 142,739 35,564 38,175 42,496 75,521 65,956 100,245 521 11,607 122,713 143,347 111,607 122,713 143,347 196,425 248,031 341,831 36,376 49,222 54,202 237,802 297,223 399,033 44,182 55,228 75,836 10,444 13,055 17,376 33,738 42,173 58,460 242 303 328 44,425 55,531 76,165 922,369 922,369 922,369		340 1,680,120	1,778,900 1		1,778,900 1,778	1,778,900 1,778,900	1,778,900	1,778,900	1,778,900 1,778,900 1,778,900	,778,900 1		1,778,900 1,7	1,778,900 1,77	1,778,900 1,778,900	00 1,778,900	1,778,900
111,085 122,131 142,739 36,564 38,175 42,496 75,521 83,956 100,245 521 562 607 111,607 122,713 143,347 196,425 248,031 341,831 36,376 49,222 54,202 237,802 297,253 396,033 44,182 55,228 75,836 10,444 13,055 17,376 34,782 55,531 76,165 34,425 55,531 76,165 922,969 922,969 922,969													1.1			
36,564 38,175 42,496 75,521 83,956 100,245 521 562 607 111,607 122,713 143,347 196,425 248,031 341,831 38,376 49,222 54,202 237,802 297,253 396,033 44,182 55,228 75,836 10,444 13,055 17,376 33,738 42,173 58,460 242 303 328 44,425 55,531 76,165 922,969 922,969 922,969		183,956 204,564	225,172	225,172 22	225,172, 225	225,172 225,172	2 225,172	22,172	225,172	225,172	225,172	225,172 2	225,172, 221	271,225 271,225	271,222 27	225,172
75,521 83,956 100,245 521 582 607 111,507 122,713 143,347 196,425 248,051 341,831 36,376 49,222 54,202 237,802 297,253 396,033 44,182 55,228 75,836 10,444 13,056 17,376 34,736 42,173 58,460 242 303 328 44,425 55,531 76,165 922,969 922,969 922,969					٠.		:		59,780	59,780	59,780	59,780	59,780 5	59,780 59,780	80 59,780	
111,607 122,713 143,347 196,425 248,031 341,831 36,376 49,222 54,202 237,802 297,253 396,033 44,182 55,228 75,836 10,444 13,056 17,376 34,736 42,173 58,460 242 303 328 44,425 55,531 76,165 922,969 922,969 922,969	¥	132,818 149,105	165,392	165,392 16	165,392 165	165,392 165,392	2 165,392	165,392	165,392	165 392	165,392	165,392 1	165,392 16	165,392 165,392	92 165,392	165,392
111,607 122,713 143,347 196,425 248,031 341,831 39,376 49,222 54,202 237,802 297,223 396,033 44,182 55,228 75,836 10,444 13,055 17,376 33,736 42,173 58,460 242 303 328 44,425 55,531 76,165	1 188831 1	658		902	902		709 709	82	709	902	502	709	202	709	709 709	709
196,425 248,031 341,831 36,376 49,222 54,202 237,802 297,233 396,033 44,182 55,228 75,836 10,444 13,056 17,376 33,736 42,173 58,460 242 303 328 44,425 55,531 76,165 64,778 64,778		614 205,247	225,881	225,881 22	225,881 225	225,881 225,881	1 225,881	225,881	225,881	225,881	225,981	225,881 2	225,881 22	225,881 225,881	81 225,881	225,881
196,425 248,031 341,831 36,378 49,322 54,202 237,802 297,253 396,033 44,182 55,228 75,836 10,444 13,055 17,376 33,736 42,173 56,460 24, 303 328 44,425 55,531 76,165 54,478 54,778 54,778 54,778 54,778 54,778 54,778 54,778	3 I															
196,425 248,031 341,831 96,376 49,222 54,202 237,602 297,235 396,033 44,182 55,228 75,836 10,444 13,055 17,376 33,738 42,173 58,460 242 303 328 44,425 55,531 76,165 922,369 922,369 922,969 64,778 64,778 64,778	Į															
39,376		431 623,231 71	717,031	717,031 71	717,031 717	717,031 717,031	117,031	717,031	717,031	717,031	717,031	717,031 7	717,031 71	717,031 717,031	131 717,031	717,031
237,802 297,253 396,033 44,182 55,228 75,836 10,444 13,055 17,376 33,738 42,173 58,460 24, 303 328 44,425 55,531 76,165 922,369 922,369 922,369 64,778 64,778 64,778	59,182 64,	64,162 69,142	74 122	74,122	74,122 74	74,122 74,122	22 74,122	74,122	74.122	74,122	74,122	74,122	74,122 7	74,122 74,122	22 74,122	74.122
44,182 55,228 75,836 10,444 13,055 17,376 33,736 42,173 58,460 242 303 328 44,475 55,531 76,165 922,969 922,969 922,969 64,778 64,778 64,778	494,813 593,	593,593 692,373		791,153 78	791,153 791	791,153 791,153	53 791,153	791,153	791,153	791,153	791,153	791,153 7	791,153 79	791,153 791,153	53 791,153	3 791 153
44,182 55,228 75,636 10,444 13,055 17,376 38,736 42,173 56,460 242 303 328 44,425 55,531 76,165 922,369 922,969 922,969 64,778 64,778 64,778																
10,444 13,055 17,376 38,738 42,173 58,460 242 303 328 44,425 55,531 76,165 922,969 922,969 922,969 54,778 64,778 64,778	96,444 117,	117,058 137,661	158,269	158,269 1	156,269 156	158,269 158,269	99 158,289	158,269	158,269	158,269	158,269	158,269	158,269 15	158,269 158,269	982,881	158,269
33,736 42,173 58,460 242 303 328 44,425 55,531 76,165 522,969 922,969 922,969 54,778 64,778 64,778	21,697 26	26,018 30,339	34,660	34,660	34,660 34	34,660 34,660	34,660	34,660	34,660	34,660	34,660	34,560	34,660 3	34,660 34,660	34,560	34,660
242 303 328 44,425 55,531 76,165 252,969 922,969 922,969 54,778 64,778 64,778	74,747 91	91,035 107,322	123,609	123,609 17	123,609 123	123,609 123,609	9 123,609	123,609	123 609	123,609	123,609	123,609 1	123,609 12	123,609 123,609	909 123,609	123,609
44,425 55,531 76,165 922,969 922,969 922,969 54,778 64,778 64,778	258	379 405	430	2 00	8	430	430 430	430	\$	65	8	83	83	88	430 430	£
922.969 922.969 922.969 64.778 64.778 64.778	96,798 117,432	432 138,065	158,699	158,699 1	158,699 15	158,699 158,699	99 158,699	158,699	158,699	158,699	158,699	158,699	158,699 15	158,699 158,699	599 158,699	158,689
2,365 922,369 922,369 922,369 4,776 64,778 64,778																
922,969 922,969 922,969 922,969 922,969 64,778 64,778 64,778																
64.778 64.778 64.778 64.778	226 696'226	98,228 98,228	9 922,969	922,369 9,	26 696'226	922,969 922,969	69 922,969	696'226 6	922,969	922,969	922,969	922,969	922,969 92	696'226 696'226	963 225'363	696,226
	64,778	64,778 64,778	3 64,778	64,778	84,778	64,778 64,778	78 64,778	3 64,778	64,778	84,778	64,778	64,778	64,778 6	64,778 64,	64,778 64,778	8 64778
-Total 987,747 987,747 967,747 987	987,747 987	987,747 987,747	7 987,747	987,747 9	987,747 98;	987,747 987,747	47 987 747	7 987 747	987,747	987,747	987,747	987,747	987,747 98	987,747 987,747	747 987 747	7 987 747
Cargo (tons)														:		
-International 66,903 66,903 66,903 66,903 66,903 66	99 206'99	66,903 66,903	3 66,903	66,903	66,903 66	66,903 66,903	03 66,903	3 66,903	66,903	66,903	66,903	66,903	9 806'99	99 806,39	66,903 66,903	3 66,903
Import 25,120 25,120 25,120 25,120 25,120 26	25,120 25	25,120 25,120	0 25,120	25,120	25,120 24	25,120 25,120	20 25,120	0 25,120	25,120	25,120	25,120	25,120	25,120 2	25,120 25,	25,120 25,120	0 25,120
Export 41,783 41,783 41,783 41,783 41	41,783 41.	41,783 41,783	3 41,783	41,783	41,783 4	41,783 41,783	83 41,783	3 41,783	41,783	41,783	41,783	41,783	41,785 4	41,783 41,	41,783 41,783	3 41,783
-Domestic 279 279 279 279 279	279	279 279	57.6	279	579	279 2	279 279	9 279	279	579	279	279	279	573	279 279	6 279
-Total 67,182 67,182 67,182 67,182 67	67.182 67	67,182 67,182	2 67.182	67,182	67,182 6	67,182 67,182	82 67,182	2 67 182	67 182	67,182	67,182	67,182	67,182 6	67,182 67,	67,182 67,182	2 67,182

Benefits due to Accommodation of the Overflow of Table 15.2.6 Foreign Passengers

(Unit: Million Colones) 2005 2010 2015 2000 Year 1996 287 287 287 **Total Benefits** 287 137

Benefits of Increasing Foreign Earnings from Foreign Visitors

Implementation of the project will increase the foreign exchange earnings from foreign passengers. This benefit is quantified by the equation 15.2.3.

$BRTt = RTt \times CONV \times FREX \times (1+GRF)^{t} \times VAGA \times RAPA (15.2.3)$

where. : Benefits in the year t due to increasing foreign passenger **BRT**t ; Average expenditure of foreign passenger in Costa Rica. This value is FREX obtained by the passenger traffic survey carried out in this study. The details are described in Appendix 15.2.1. (= 82,000 Colones) **GRF** : Annual growth rate of foreign expenditure estimated by the growth of GDP of visited foreigner's countries. (= 0.03) ; Value-added ratio in general average. The ratio is determined by VAGA referring to the average ratio of Malaysia and Thailand, since the personnel income level of both countries is nearly equal to that of Costa Rica and no value-added ratio is available for Costa Rica (=0.28); The portion of the incremental added-value ratio which should be RAPA attributed to the project investment (=0.17)RAPA is obtained by equation 15.2.4 $RAPA = PAXP/(TBRT \times RCPA)$ -----(15.2.4)

where.

PAXP ; Opportunity cost of the project investment for pax (= 769,000,000 Colones)

TBRT Added value in yearly average (= 7,428,000,000 Colones)

Share of capital reward in added value. The detailed estimation is **RCPA** shown in Appendix 15.2.2 (= 0.6)

The benefits of increasing foreign earnings from foreign visitors is shown in Table 15.2.7.

Benefits of Increasing Foreign Earnings Table 15.2.7 from Foreign Visitors

				(Unit: Millio	n Colones)
Year	1996	2000	2005	2010	2015
Total Benefits	472	1,114	1,291	1,497	1,735

Benefits due to Increase of LACSA'S Revenue

Increase in the air fare revenue of LACSA by the overflow of foreign passengers will expand the employment opportunity of Costa Rican people. This will contribute to the national economy.

This benefit is quantified by the equation 15.2.5.

BLAt = RTt x SHLA x FARE x VAPA x RALA----- (15.2.5)

where,

BLAt : Increase in the fare revenue of LACSA

SHLA: Share of LACSA in all airlines in 1991 source: DGAC (= 0.34)
FARE: Average pax fare between Juan Santamaria and Miami in 1991 is

used as typical air fare (= 54,000 Colones)

VAPA : Value-added ratio (personnel cost): (total operating cost) indicate the

contribution ratio of the employment opportunity of Costa Rican

people (= 0.43)

RALA: The portion of the incremental added-value ratio which should be

attributed to the project investment (= 0.30).

RALA is obtained by equation 15.2.6.

RALA = PAIP/TBLA x RCR3----- (15.2.6)

where,

PAIP : Opportunity cost of the project investment for pax

(= 769 Mill. Colones)

TBLA : Added value in yearly average (= 3,227 Mill. Colones)

RCLA : Share of capital reward in added value. The detailed estimation is

shown in Appendix 15.2.2 (= 0.8)

The benefits due to increase of LACSA's revenue is shown in Table 15.2.8.

Table 15.2.8 Benefits due to Increase of LACSA'S Revenue

				(Unit: M	fillion Colones)
Year	1996	2000	2005	2010	2015
Total Benefits	494	1,036	1,036	1,036	1,036

d) Time saving benefit of Costa Rican passengers

The improvement of the passenger processing area in the terminal building and introduction of new equipment will reduce the queuing time of passengers. This time saving benefit will be quantified only for Costa Rican people but not for foreign visitors because only Costa Rican time contributes to the national economy.

This benefit is quantified by the equation 15.2.6.

where,

BSTt : Benefits due to saving in queuing time of Costa Rican pax

WSSt : Total pax in "with project case"

SHFR : Average share of foreign pax in total pax between 1981 and 1990

(= 0.61 source: DGAC)

TSPT : Saving time of queuing in new terminal building estimated from

passenger traffic survey (= 20 minutes)

GRC: Yearly growth rate of the time value of Costa Rican pax taking

account of the growth rate of GDP in Costa Rica. (= 0.03)

TV : Time value of Costa Rican pax (= 4.67 colones per minute in 1991)

This TV is obtained by equation 15.2.7.

TV = INCOS/WRDY/WRMN ----- (15.2.7)

where.

INCOS: Average annual income of Costa Rican passenger obtained by

interview survey (= 675,000 colones/year)

WRDY: Average working day (= 300 days)

WRMN: Average working time per day (= 8hrs x 60 minutes = 480 min)

The time saving benefits of Costa Rican passengers is shown in Table 15.2.9.

Table 15.2.9 Time Saving Benefits of Costa Rican Passengers

(Unit: Million Colones)

Year	1996	2000	2005	2010	2015
Total Benefits	53	78	90	105	121

e) Benefits due to Accommodation of the Overflow of Export Cargo

The airport development will enable it to accommodate the overflow of export cargo. This benefits the national economy.

This benefit is quantified by the equation (15.2.8).

$$BEXt = WCGt \times PEX \times REXF \times RACG$$
 (15.2.8)

where.

BEXt : Benefits due to accommodating the overflowed export cargo.

WCGt : Incremental exported cargo in "with" project case

PEX : Average price per ton of exported cargo estimated from the trading

record in 1991 (= 445, 711 Colones)

REXF : Value-added ratio in agricultural department. The ratio is determined

referring to the average ratio of Malaysia and Thailand, since the personnel income level of both countries is nearly equal to that of Costa Rica and no value-added ratio is available for Costa Rica.

(=0.7)

RACG; The portion of the incremental added-value which should be

attributed to the project investment (= 0.011)

RACG is obtained by equation 15.2.9

 $RACG = CRGP/(TBEX \times RCCG)$ ---- (15.2.9)

where,

CRGP; Opportunity cost of the project investment for cargo

(= 81,000,000 Colones)

TBEX ; Added value in yearly average (= 36,025,000,000 Colones)

RCCG ; Share of capital regard in added value. The detailed estimation is

shown in Appendix 15.2.2 (= 0.2)

Benefits due to accommodation of the overflow of export cargo is shown in Table 15.2.10.

Table 15.2.10 Benefits due to Accommodation of the Overflow of Export Cargo

(Unit: Million Colones)

				. (\$1116. 10	
Year	1996	2000	2005	2010	2015
Total Price	201	424	424	424	424

f) Benefits due to the Increase of Employment Demand by Construction Work

Construction work for the airport development will provide new employment demand in the labor market. This benefit is quantified by the increase in the income of un-skilled labor as indicated in equation 15.2.10.

where

BADt : Increase in the income of unskilled labor (value in 1991)

USLt : Number of unskilled labor employed by the project as shown in

Table 15.2.11

Table 15.2.11 Number of Un-Skilled Laborers

 Year
 1993
 1994
 1995

 Number of Un-skilled laborers
 4,400
 58,000
 36,000

WAGE: Wages paid to unskilled labor employed by the project

(= 1,000 Colones/day)

SWAG : Shadow wage for the unskilled labor. This is the minimum salary

in 1990 as confirmed by Banco Central (= 272 colones/day)

Benefits due to the increase of employment by construction works is show in Table 15.2.12.

Table 15.2.12 Benefits due to the Increase of Employment by Construction Work

<u> </u>	4, 4	(Unit: Millio	n Colones)
Year	1993	1994	1995
Total Benefits	2.8	38.7	23.7

15.2.4 Economical Evaluation of the Project

(1) Premises

a) Evaluation period

The evaluation period covers the 25 years from 1991 to 2015. The construction period will be three years from 1993 to 1995. In 1996 the airport will start its new service.

b) Life expectancy and salvage value

The life expectancy of the project investment is assumed to be 25 years. The salvage value is assumed to be zero (0) after 25 years from the inauguration of short-term development.

The residual value of the project investment is considered to be the last year of the evaluation.

Table 15.2.13 Economic Cash Flow

																														8	78877	alabara	1,4667	Co Co	<u> </u>	
																									ΛbΛ	7,456	1,837	7		TOTAL	12,639	5,18	5,774	3,837	y 2 3 28	
2015	1,640,000	165,392			8	123,609		885,389	47.783		1		12	8	121	424		85. 24	T			Б,	126	4,816		8	ठ उ	<u>"</u>	munun	Ī	88	60	8	N C	5 O	
2014	640,000 1	165,392			183/1/	123,609		922,969	41.785			6	1 88	88	118	424		3,550			¥	Б	126	3,424		83	33 °	°			æ	თ	\$	(N) (b 0	
2013	,640,000	185,392		į	717,031	123,609		822,868	41,783			26	3 \$3	1,036	114	ğ		3,488			¥	8 8	128	3,372		6/2	5 5	2			88	5	8	~ ÷	= 6	
2012	640,000 1	165,382		Š	183/1/	123,609		922,969	41,783			284	88,	88	Ε	\$		3,447			Ŗ	8 8	126	3,321		33	22 \$	2			318	22	ĸ	_د ج	ā -	
2011	540,000 1	165,392			190'/1/	123,609		922,969	287,13			8	. Ž	ž. 83	90	424		3,397			¥	5 5	126	3,271		88	3 B	-			352	চ	88	დ <u>ნ</u>	2 -	
2010	540,000 1,	165,392			5 3'/-	123,609		922,969	1,783			787	1,487	1,036	50	\$		3,346			S &	æ	348	3,001		346	3 . 8	ات			88	8	105	= 8	3 ~	
2003	1,640,000 1,640,000 1,640,000 1,640,000 1,640,000	185,392			1871/	123,609		986,228	41,783			787	1,453	1,038	효	424		3,300			×	а	128	3,176		413	£ 8	8			\$	9	124	ი გ	ð -	
2008	1,640,000	165,382			188'/1/	123,609		852,969	21,783			7967	i ₹	960,1	8	ğ		3,257			×		128	3,131		\$\$	<u>₹</u> 8	В			474	85	47	æ %	8 -	
2007	640,000 1	165,392			(S)/L/	123,609		822,889	£ 587			8	1,370	88	88	\$		3,213			8	8	126	3,087		ङ्क	167	8		;	섫	ស	174	~ 59	\$ v₁	
2006	1,640,000 1,640,000 1,640,000 1,640,000	165,392			ES)'/C	123,609	!	696,726	1783			78,	8	1,036	83	2 5		3,176			æ	5	128	3,044		556	8 2 €	8		1	9/5	83	8	eo ξ	8 ~	
2005	640,000 1,	165,392			3	123,609		922,969	41,783			8	8	1,036 360	8	ğ		3,129			×	8	126	3,003		614	8 8	6			8	88	2 4	5 b	ś w	
2004	640,000 1,	165,392			3	123,809		822,969	1783			287	25	1,036	28	\$		3,089			æ	55	126	2,963	٠	679	£ 8	8			8g	ន	88	5 5	3 4	
2003	1,840,000 1	165,392		1200		123,609	-	922,969	1 783			8	1,217	98	88	424		3,050			8	55	128	2,924		750	88 5	<u>g</u>			22	8	35	<u> </u>	2 v	
2002	640,000	165,392			3/2	123,609		322,989	41,783			787	31,	900'	8	424		3,012			8	ਲ	53	2,898		8	8 9	2		,	98	8	405	t 84	<u>3</u> ~	arm developmen
2001	640,000 1,640,000	165,392		11 000	ign', : ,	123,609		922,969	41,783			8	1,147	1,036	8	2 2	·	2,975			89	55	126	2,349		214	g 5	ŝ			3	4	8	8 %	2 6	этт деу
2000	640,000 1	165,392		8	180'/1/	123,609		922,969	41,783			287	1,114	1,036	R	424		2,930			8	ਲ	2 5	2,813		1,014	£ 5	8			86	₹	2,0	% E	ភ្នំ ដូ	or long-t
1999	546,200 1	149,105			102,620	107,322		322,969	41,763			92	3	8	Ł.	88		2,530			₩.	25	126	2,404		176	33 E	8			<u>5</u>	ক	85 t	8 5		stment h
1998	452,400 1	132,818				94,036		922,969	783			212	775	765	\$3	312		2,130			8	क	126	2,004	•	98	889	a l			8	25	\$ '	8 8	3 8	no inve
1997	,358,600 1	116,530			3	74,747		882,983	4,783			175	619	8	B	8		1,739			19	8	‡\$	1.613		718	3 8	3			器	3	285 285 287	ଫ ହ	g %	cause of
1996	264,800	100,243		ě	3	58,480		922,969	41,783			137	225	\$	23	8		1,357			8	8	126	1231		98	\$ 55	3		ļ	2	₹	£ :	도 설	8 8	2000 be
1995	171,000	93,956		8	E2),545,	42,173		922,969	138								8	8		3,155			3,155	-3 131		-1800	1,510	987		!	ξ	2,005	= ;	ξζ. α	. 8	in year
1994	922,959 1,071,788 1,121,394 1,171,000 1,264,800 1,356,600 1,452,400 1,548,200 1,640,000 1,	75,521			8. St	33,738		822,969	41 783	8	3						88	8		2,733			2,733	-2,694		-1,918	. 559	077		;	83	<u>\$</u>	81 9	28. 28. t	124	s ceiling
1993	1 887,170,	290'29			6 6 6 6	25,304		322,369	41,783	80 83	3						ო	. თ		764			75	.761 -		8	8 8				cv	96	N i	8	, <u>2</u>	l reach l
1990	922,969 1	41,763						322,969	287,14		34.																									In WP wi
Year	Persons)	Dog.	Traffic	Persoins)		p ort	H (STOCK)		Door 1	n-skilled	1		. e	- anue		Ogligo Ogligo	Employ				jeuus	est UJ			/alue at 991	*	₹ ×	<u></u>	27.5%	st Ratio				۶ ۱۹ ۲۹		Traffic
ltem Ye	i. Traffic in WP 1-1 Passengers(Persons) international (*1)	international Export	2. Incremental Traffic in WP	2-1 Passengers(Persons)	Principal Constitution (Constitution Constitution Constit	International Export	3. Traffic in WOP 3-1 Passengers(Persons)	International	3-2 Cargo(ton) International Export	4. Number of Un-skilled	accur(wall roay)	5. Benefits a) Overflowing Pay	b) Foreign Earning	c) LACSA's Revenue	d) Time Saving	e) Overflowing Cargo	1) Construction Employ	Residual Value Benefit Total	6. Cost	a) Construction	b) Replacementc) Additional Personnel	d) Additional M& E	Cost Total	7. Net Benefit	8. Discounted Value at End of Year 1991	a) At Rate of 12%	b) At Rate of 20%	9. EIRR =	23	10. Benefit /Cost Ratio	a) At Rahe of 12%		b) At Rate of 20%	At Bate of 2004	G) At Flate or Se	Note (*1): Traffic in VIP will reach its ceiling in year 2000 because of no investment for long-

c) Opportunity Cost

The opportunity cost of capital is set at 12% based on the evaluatio criteria for the selection of viable project by the Government of Costa Rica.

The economic cash flow of costs and benefits are shown in Table 15.2.13.

(2) Results of Economic Evaluation

The Economic Internal Rate of Return (EIRR), Benefit/Cost Ratio (B/C Ratio) and Net Present Value (NPV) of the Project are calculated and summarized in Table 15.2.14.

Table 15.2.14 Evaluation Indicators

EIRR (%)	B/C Ratio (*)	NPV (Colons) (*)
27.5	2.44	7,456,000,000

Note (*): At discount rate of 12 %.

The result of the economic analysis shows that the development of Juan Santamaria Airport is feasible because the EIRR of 27.5% exceeds the opportunity cost of capital (12%) in Costa Rica.

15.2.5 Sensitivity Analyses

Sensitivity analyses were also carried out to provide probablistic judgement on the investment. The EIRRs were calculated on various projections and summarized in Table 15.2.15.

Table 15.2.15 Results of Sensitivity Analyses

- Valence Adm	Projections	EIRR (%)
Oriç	ginal Case	27.5
Case 1	Costs down by 10% and Traffic Demands up by 10%	35.2
Case 2	Costs up by 10%	25.5
Case 3	Traffic Demands down by 10%	22.2
Case 4	Costs up by 10% and Traffic Demands down by 10%	20.4

The above sensitivity analyses show that even if the project costs go up by 10% and traffic demands go down by 10% simultaneously, the project maintains a high EIRR of 20.4% more than the opportunity cost 12%.

15.2.6 <u>Indirect/Intangible Benefits</u>

Although the cost-benefit analysis has been executed based on direct and tangible benefits, projects in the transport sector are generally characterized by extensive indirect and intangible benefits which are not quantified by the cost-benefit analysis.

In this particular case, the implementation of the Project will bring the following indirect and intangible benefits:

- (a) Promotion of safety, reliability and punctuality in the aircraft operation and air transport.
- (b) Promotion of convenience and comfortability for the airport users such as air passengers, welcomers, well wishers.
- (c) Promotion of foreign investment:
 Development of the airport will promote foreign investment to Costa Rica by offering high speed and efficient air transportation.
- (d) Enhancement of foreign trade and communication:
 Costa Rica with a long tradition of democracy and political stability has the potential to play an important role as a trading and communication center in Central America. Satisfactory air transport enhances foreign trade and communications with the countries of Central, North and South America, and Europe.

15.3 Financial Analysis

15.3.1 Introduction

Financial analysis is usually carried out on projects which are accompanied by revenue. The main objective of a financial analysis is to make clear whether or not the revenue from a project itself is enough to carry out implementation, maintenance and operation of a project.

15.3.2 Expenditures

(1) Investment Costs

The financial investment cost of the Project has been described in Section 15.2.2 (1) and (2) together with the economic cost.

(2) Operation and Maintenance Costs

a) Personnel Cost

With the implementation of this Project, the number of personnel for Juan Santamaria Airport is assumed to increase from the present 204 to 261.

The future personnel cost for Juan Santamaria Airport is estimated as described in Section 15.2.2 (3) a).

b) Material and Equipment Costs

The costs for material and equipment are the financial costs described in Section 15.2.2 (3) b).

15.3.3 Revenue

- (1) Revenue to be Quantified
 - (a) Revenue from the overflow of international passengers.
 - (b) Revenue from the overflow of international cargo.

(2) Estimation of Revenues

a) Revenue from the Overflow of Passengers

This revenue is composed of aircraft landing charges, navaid charge, airport tax from passengers, etc. obtained from international overflow of passengers.

This revenue is estimated by the equation 15.3.1.

$$FPSt = DRTt \times FSGP \times (1 + IMDO) + RTt \times CONV \times ATAX \times VAPA + (DRTt - RTt) \times CONV \times ATDO \times VAPA ----- (15.3.1)$$

where,		
FPSt	;	Amount of the revenue from passengers in year t
DRTt	÷	Incremental international passengers in year t
FSGP	;	Operating revenue of the Airport per passenger
		(= 370 Colones/person)
IMDO		Domestic passenger portion estimated based on the revenue of
		SANSA (= 2%)
RTı	,	Incremental foreign passengers in year t
		(= 0.61 x (International passengers))
CONV	÷,	Conversion factor from two-way to one-way (= 1/2)
ATAX	,	Airport tax for a foreign passenger in 1991 (= 574 Colones)
VAPA	;	Profit ratio of the Airport in 1991 by DGAC record (= 0.47)
ATDO		Airport tax for Costa Rican passengers in 1991 (= 5.623 Colones)

The revenues from the overflow of passengers is shown in Table 15.3.1.

Table 15.3.1 Revenues from the Overflow of International Passenger

		· · · · · · · · · · · · · · · · · · ·		<u>(Unit: Milli</u>	on Colones)
Year	1996	2000	2005	2010	2015
Total Revenue	333	699	699	699	699

b) Revenues from the Overflow of International Cargo

This revenue is obtained from the international incremental cargo and is estimated by the equation 15.3.2.

Table 15.3.3 Financial Cash Flow

																				TOTAL		90 90 90 90 90 90 90 90 90 90 90 90 90 9	4,117			TOTAL					4,074
2015	640,000	255,172			717.031	158 269			200 S	8	88	8	2,156		gu seg.	8	83	132	2,024			2,35	219						132	13	2
2014	640,000 1	225,172			717.031			{	826,328	3	689	8	784			8	83	8	652			26	8 5						132	5	2
2013	540,000 1,	225,172			717.031		1			20,500	88	83	\$		*	88	8	132	652			2	8 4				٠.		132	16	2
2012	340,000 1.0	225,172			717.031		1	3	922,369 . 922,369	50,500	%	8	784			ස	88	132	652	11		\$	<u>\$</u> ‡						132	18	8
2011	¥0,000 1,¢	225,172			717.031		1			25,00	88	88	\$			8	88	132	652			¥	÷ 8						32	8	က
2010	340,000 1,6	225,172			717 038 7		1			20,50	88	8	784		٠.	8 8	8	35	430			%	£3 ₹3						354	88	Ξ
5003	340,000 1,4	225,172			717 034					20,00	6 69	88	787			8	83	132	652			3 5	₹ 8						132	54	3
2008	740,000 1,	25,172			717 031					60°50°	669	88	\$			88	8	132	652			784	ਲੋਂ ਲ				٠		132	8	မ
2007	240,000 1,6	225,172			717.031					202	88	98	78			8	8	132	652			簽	<u>E</u> ∂	1					132	প্ত	7
2006	640,000 1,	225 172			717.033		1			20.00	8	88	78			g	8	132	652	:		\$	<u>88</u> №						132	88	6
2002	640,000 1,	225,172			717,031					202'8	88	8	\$			8	8	8	652			철	8 6						恏	જ	10
2004	640,000 1,	225,172			717.031		1	. 60	808'778	305,00	669	88	784			8	8	132	652			ğ	153 ES						55	8	12
2003	640,000 1,	225,172			717,031		•	9		200'00	69	88	75			8	8	132	652		٠	\$	£ 2						132	4	15
2002	640,000 1,	225,172			717.031			. 8		200,000	669	8	784			g	g	132	652		:	¥	275 106						132	8	18
2001	640,000 1,	225,172			717.031		1	8		20,50	689	ş	787			8	8	132	. 652			<u>\$</u>	3 23 24 25						132	53	72
2000	640,000 1,	225,172			717,031			990		26,30	88	8	784			8	8	132	652			%	88 23						132	88	
1999	546,200 1	204,564			623,231			. 090		20,200	806	74	882			8	8	132	250			88 88	35 55 55						132	8	31
1938	452,400 1,	183,956			529,431	117,053	1			3	516	8	579			8	83	132	744			579	162 163						132	88	37
1997	358,600 1	163,347			435,631 529,431	% 44.		8		3	Ź.	ß	476			8	83	132	整			476	8 <u>8</u>						132	75	44
1996	264,800 1	142,739			341,831			8		36'36	88	4	374			8	8	132	242		,	374	සූ ස						132	8	ន
1995	1 000 121,	122,131						99	606,325	90,309	0	0	0		3,219			3,219	-3,219			0	00						3,219	2,199	1,552
1984	,121,394 1	111,085			198,425 248,031	44,182		230 000	505,326 500 90	6,260	0	O	O		2,819			2,819	-2,819			ο ·	0 0		٠				2,819	2,118	1,631
1993	922,989 1,071,788 1,121,394 1,171,000 1,284,800 1,546,200 1,546,200 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000 1,640,000	100,040			148,819			80		200'00	0	0	0		825			825	-825				00						825	682	573
1990	922,969 1,	66,903						9		20,30											_							_			7.
Year	ersons) 1)		raffic		ersons)		0	ersons)			్ఞ	argo	2			sonnei	w			evenue		: م	% %	T	5.7%	-ipuedx	Year		,o	~ %	c) At Rate of 20% 573 1,631 1,552 53 44 37 31
them them	. Traffic in WP 1-1 Passengers(Persons) International ("1)	rc cargo(ron) International	2. Incremental Traffic	O-	2-1 Passengers(Persons) international	2 Cargo(ton) International	CIMI Ni Ni	3-1 Passengers(Persons)	Cargo(ton)	Nation Ide	. Revenue a) Overflowing Pax	b) Overflowing Cargo	 c) Pesidual Value Revenues Total 	5. Expenditure	a) Construction	b) Replacement c) Additional Personnel	d) Additional M & E	Expenditure Total	Profit	. Discounted Revenue	at End of Year 1991	a) At Rate of 0%	 D) At Hate of 10% c) At Rate of 20% 	LH H		Discounted Expendi-	ture at End of Year	•	a) At Rate of 0%	b) At Rate of 10%	c) At Rate of 20%
	1. Traff 1-1 Pas Interr	Internal	2. Incre	W m	2-1 Pas Interr	2-2 Cargo(ton) International	7.5	3.1 Pass	3-2 Cargo(ton)		a) Overflow	නී ජ		200 200 14		O Her	g Acc	Expen	6. Net Profit	7. Disc	at End	9 Y	0 A	8 FIRR=		9. Disc	ture &	1991	a) At F	b) At F	c) At F

$$FCGt = (IECt + IICt) \times FSCG - (15.3.2)$$

where

FCGt; Amount of the revenue from cargo in year t

IECt ; Incremental exported cargo in year t
IICt ; Incremental imported cargo in year t
FSCG : Operating revenue of the airport per cargo

 $(= 370 \times 1.45 = 537 \text{ Colones/ton})$

The revenues from the overflow of cargo is shown in Table 15.3.2.

Table 15.3.2 Revenues from the Overflow of Cargo

				(Unit: Millio	n Colones)
	1996	2000	2005	2010	2015
Total Revenue		85	85	85	85

15.3.4 Financial Evaluation of the Project

(1) Premises

The evaluation period, lifetime value shall be the same as for the economic analysis.

It should be noted that the financial analysis of the Project was carried out as a public utility works under the condition that revenue and expenditures are controlled by the Government of Costa Rica.

(2) Calculation and Evaluation

The FIRR (Financial Internal Rate of Return) is calculated by comparing the expected revenues and expenditures as shown in Table 15.3.3. The calculated FIRR is as low as 5.7 %. The project, therefore, will not be financially feasible unless a loan with low interest is available.

However, if it is possible to increase the existing charges quantified in the above analysis by 30 percent at the time of completion of the project and then increase them by 40 percent every ten years, the FIRR increase to 12.4 % which is considered more or less financially feasible.

In order to attain the possibility of increasing the airport charges, the aircraft landing charge and airport service tax which constitute a large part of the total revenues were compared in Table 15.3.4 and 15.3.5.

Even assuming that the aircraft landing charge is increased to 130 % of the present level, that is 235 US\$ for DC-10, the level of charge is still relatively low as compared with other countries.

On the other hand, the present airport service tax is low for non-resident passengers comparing to that of the countries in the vicinity of Costa Rica. The present tax for non-resident passenger could increase by a rate of more than 30 %.

Table 15.3.4 Comparison of Aircraft Landing Charge of DC-10

(Unit: US\$) Landing Charge Country Airport Costa Rica Juan Santamaria 181 J.F.K. 860 United States 2,950 West Germany Frankfurt 750 United Kingdom Heathrow Mexico Mexico city 910 990 Thailand Bangkok Narita 4,760 Japan

Note: As of February 1992 with MTOW 252 ton

Table 15.3.5 Comparison of Airport Tax

(Unit: US\$)

	·	(Οιπ. σοψ)
Country	Domestic	International
Costa Rica		Resident 43.25
	• •	Non-Resident 4.25
Panama	2 · · ·	15.0
Nicaragua		10.0
Chile	12.5	12.5
Mexico	11.5	10.0
Thailand	7.9	7.9
Japan	15.7	15.7

CHAPTER 16 CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 16 CONCLUSIONS AND RECOMMENDATIONS

16.1 Conclusions

As a result of the comprehensive study presented in this report which includes airport master planning of three airports, selection of a priority project and the feasibility study on the short-term development project of Juan Santamaria Airport (the Project), it is concluded that the existing Juan Santamaria Airport be rehabilitated and developed in order to solve the present capacity problems and to cope with the traffic requirements anticipated up to the year 2000. The Project will consist of construction of a new apron, taxiway and new cargo building, improvement of the existing runway and road pavement, expansion of the passenger terminal building, and installation of airport utilities.

These conclusions have been reached for the following major reasons:

- a) The short-term development of Juan Santamaria Airport was selected as the highest priority project from the viewpoints of importance and urgency in the international airport system of Costa Rica.
- b) The Project offers maximum use of the existing facilities with minimum investment and enables flexible selection for the implementation of the long-term development to comply with international standards.
- c) The project cost is estimated at 6,863 million Colones in the short-term development and the economic internal rate of return (EIRR) is 27.5 percent. Hence, the Project is feasible from the viewpoint of the optimum allocation of resources in the national economy.
- d) The value of FIRR is estimated as low as 5.7%. This is because the financial analysis of the Project was carried out as a public utility work under the condition that revenue and expenditures are controlled by the Government of Costa Rica.
- e) The implementation of the Project will have impacts on:
 - Contribution to international tourism development,
 - Contribution to increase opportunities for trade and business,
 - Enhancing foreign investment,
 - Generating employment opportunities, and
 - Assurance of air transport safety.

16.2 Recommendations

- (1) It is recommended that the Project be implemented as soon as possible and, therefore, that the preparatory work be initiated at the earliest possible date.
- (2) This study proposes the long-term development plan of Juan Santamaria Airport in which airport facilities will meet with international standards. However, some problems related to poor meteorological conditions and the aircraft noise will remain unsolvable if the airport remains at the existing site.

It is therefore recommended that a comprehensive study be started to determine the feasibility of a new airport development, to compare that with the long-term development plan proposed in this study, and to finally decide on the development of the existing airport or the construction of a new airport.

