

12.5 Economic Evaluation

In this section, the economical justification of the Project Road is analysed by the indicators explained in 12.1.2.

12.5.1 Premises

Premises for economic evaluation were assumed as the below:

- Implementation schedule and cost disbursement

According to the implementation schedule shown in Fig. 11.2, disbursements of economic cost are assumed as shown Table 12.1.(1), (2), (3), (4) by alternative.

- Project Life

Project life of 25 years, after the opening of the whole of the sections of the Project Road, was assumed.

- Annual Increasing Rate of Benefit

Annual benefits after the opening of the Project Road are assumed as shown in Table 12.11.

- Opportunity Cost of Capital (Discount Rate)

Three of the cases, 8%, 10% and 12% are assumed corresponding to the various level of long-term interest rate in Nepal.

Table 12.11 Annual Increasing Rate of Benefit

Case	Expected Annual Increasing Rate (%)		Remarks
	Vehicle Operating Cost Saving (1)	Time Cost Saving (2)	
Partial Use of a Certain Section, before the Completion of Whole of the Project Road	7.6	7.6	Increasing rate of each of the benefit during 1995-2000, for all the traffic on the Section I
Up to 10 years after the Opening of the Project Road for all sections	8.4	11.6	Increasing rate of each of the benefit during 1995-2000, for all the traffic on the Project Road, expecting at least 10 years' increase of developed & induced traffic
After 11th Year, up to the End of the Project Life	7.7	7.7	Increasing rate of normal traffic on the Project Road

12.5.2 Evaluation

The results of three indicators for economic evaluation (IRR, B/C, NPV) are listed in Table 12.12 based on the economic cash flow in Table 12.13, (1), (2), (3), (4). The IRR distributes in the range 8.7% with the maximum IRR of 9.88% in case 4. B/C ratio comes up with over 1.00 in the all cases at the discount rate of 8%. NPV becomes positive only for these cases. It is pointed out that the over-all levels of economic indicators are not so high due to the relatively small traffic volumes in the study area and relatively long distance of the Project Road. But judging from these results of economic indicator, which only reflect "direct benefit" of the Project Road, it could be concluded that the Project Road is feasible under the well devised conditions for implementation.

Table 12.12 Results of Economic Evaluation

	IRR(%)	B/C under Three Discount Rates			N.P.V under Three Discount Rates (in Million NRs)		
		8%	10%	12%	8%	10%	12%
Case 1	8.72	1.102	0.847	0.665	311.1	-438.5	-909.5
Case 2	9.70	1.261	0.962	0.749	713.2	155.8	-580.1
Case 3	9.57	1.261	0.940	0.715	684.9	-143.1	-630.6
Case 4	9.88	1.301	0.984	0.759	802.2	-39.8	-539.1

Table 12.13 (1) Economic Cost and Benefit (Case 1)

Year	Construction Cost		O&M cost	Replacement Cost	Cost Total	VOC Saving Benefit	Time Cost Saving Benefit	Benefit Total	B-C
	F.C.	L.C.							
1 1989	61.9	0.0	61.9	0.0	61.9	0.0	0.0	0.0	-61.9
2 1990	431.6	66.1	497.7	0.0	497.7	0.0	0.0	0.0	-497.7
3 1991	651.5	96.3	747.7	0.0	747.7	0.0	0.0	0.0	-747.7
4 1992	711.7	102.4	814.1	0.0	814.1	0.0	0.0	0.0	-814.1
5 1993	675.3	98.8	774.1	0.0	774.1	0.0	0.0	0.0	-774.1
6 1994	690.0	82.3	772.2	1.2	773.5	34.5	3.0	37.5	-736.0
7 1995	117.2	9.8	127.0	5.6	132.6	187.2	14.7	201.9	69.3
8 1996	0.0	0.0	0.0	7.0	7.0	203.0	16.4	219.4	212.4
9 1997	0.0	0.0	0.0	7.0	7.0	220.1	18.3	238.4	231.4
10 1998	0.0	0.0	0.0	7.0	7.0	238.6	20.4	259.0	252.0
11 1999	0.0	0.0	0.0	7.0	7.0	258.6	22.8	281.4	274.4
12 2000	0.0	0.0	0.0	7.0	7.0	280.5	25.4	305.9	298.9
13 2001	0.0	0.0	0.0	7.0	7.0	304.1	28.3	332.4	325.4
14 2002	0.0	0.0	0.0	7.0	7.0	329.6	31.6	361.2	354.2
15 2003	0.0	0.0	0.0	7.0	7.0	357.3	35.3	392.6	385.6
16 2004	0.0	0.0	0.0	7.0	7.0	387.3	39.4	426.7	419.7
17 2005	0.0	0.0	0.0	7.0	7.0	419.8	44.0	463.8	456.8
18 2006	0.0	0.0	0.0	7.0	7.0	452.1	47.4	499.5	492.5
19 2007	0.0	0.0	0.0	7.0	7.0	486.9	51.0	537.9	530.9
20 2008	0.0	0.0	0.0	7.0	7.0	524.4	54.9	579.3	572.3
21 2009	0.0	0.0	0.0	7.0	7.0	564.8	59.1	623.9	616.9
22 2010	0.0	0.0	0.0	7.0	61.8	608.3	63.7	672.0	610.2
23 2011	0.0	0.0	0.0	7.0	7.0	655.1	68.6	723.7	716.7
24 2012	0.0	0.0	0.0	7.0	7.0	705.5	73.9	779.4	772.4
25 2013	0.0	0.0	0.0	7.0	7.0	759.8	79.6	839.4	832.4
26 2014	0.0	0.0	0.0	7.0	7.0	818.3	85.7	904.0	897.0
27 2015	0.0	0.0	0.0	7.0	7.0	881.3	92.3	973.6	966.6
28 2016	0.0	0.0	0.0	7.0	7.0	949.2	99.4	1048.6	1041.6
29 2017	0.0	0.0	0.0	7.0	7.0	1022.3	107.1	1129.4	1122.4
30 2018	0.0	0.0	0.0	7.0	7.0	1101.0	115.3	1216.3	1209.3
31 2019	0.0	0.0	0.0	7.0	7.0	1185.8	124.2	1310.0	1303.0
32 2020	0.0	0.0	0.0	1.7	1.7	319.3	33.4	352.7	351.0

Unit MRS. million

Table 12.13 (2) Economic Cost and Benefit (Case 2)

Year	Construction Cost		O&M cost	Replacement Cost	Cost Total	VOC Saving Benefit	Time Cost Saving Benefit	Benefit Total	B-C
	F.C.	LC.							
	Total								
1 1989	61.9	0.0	61.9	0.0	61.9	0.0	0.0	0.0	-61.9
2 1990	61.8	7.5	69.3	0.0	69.3	0.0	0.0	0.0	-69.3
3 1991	284.2	42.3	326.5	0.0	326.5	0.0	0.0	0.0	-326.5
4 1992	508.0	74.2	582.2	0.0	582.2	0.0	0.0	0.0	-582.2
5 1993	594.5	84.0	678.5	0.0	678.5	0.0	0.0	0.0	-678.5
6 1994	583.1	90.4	673.5	1.2	674.7	34.5	3.0	37.5	-637.2
7 1995	665.9	95.7	761.6	1.7	763.2	49.5	4.3	53.8	-709.4
8 1996	520.8	56.5	577.3	1.7	578.9	53.3	4.6	57.9	-521.0
9 1997	59.0	5.0	64.0	5.6	69.7	179.5	14.9	194.4	124.7
10 1998	0.0	0.0	0.0	7.0	7.0	238.6	20.4	259.0	252.0
11 1999	0.0	0.0	0.0	7.0	7.0	258.6	22.8	281.4	274.4
12 2000	0.0	0.0	0.0	7.0	7.0	280.5	25.4	305.9	298.9
13 2001	0.0	0.0	0.0	7.0	7.0	304.1	28.3	332.4	325.4
14 2002	0.0	0.0	0.0	7.0	7.0	329.6	31.6	361.2	354.2
15 2003	0.0	0.0	0.0	7.0	7.0	357.3	35.3	392.6	385.6
16 2004	0.0	0.0	0.0	7.0	7.0	387.3	39.4	426.7	419.7
17 2005	0.0	0.0	0.0	7.0	7.0	419.8	44.0	463.8	456.8
18 2006	0.0	0.0	0.0	7.0	7.0	455.1	49.1	504.2	497.2
19 2007	0.0	0.0	0.0	7.0	7.0	493.3	54.8	548.1	541.1
20 2008	0.0	0.0	0.0	7.0	7.0	531.3	59.0	590.3	583.3
21 2009	0.0	0.0	0.0	7.0	7.0	572.2	63.5	635.7	628.7
22 2010	0.0	0.0	0.0	7.0	7.0	616.3	68.4	684.7	677.7
23 2011	0.0	0.0	0.0	7.0	7.0	663.8	73.7	737.5	730.5
24 2012	0.0	0.0	0.0	54.8	61.8	714.9	79.4	794.3	732.5
25 2013	0.0	0.0	0.0	7.0	7.0	769.9	85.5	855.4	848.4
26 2014	0.0	0.0	0.0	7.0	7.0	829.2	92.1	921.3	914.3
27 2015	0.0	0.0	0.0	7.0	7.0	893.0	99.2	992.2	985.2
28 2016	0.0	0.0	0.0	7.0	7.0	961.8	106.8	1068.6	1061.6
29 2017	0.0	0.0	0.0	7.0	7.0	1035.9	115.0	1150.9	1143.9
30 2018	0.0	0.0	0.0	7.0	7.0	1115.7	123.9	1239.6	1232.6
31 2019	0.0	0.0	0.0	7.0	7.0	1201.6	133.4	1335.0	1328.0
32 2020	0.0	0.0	0.0	7.0	7.0	1294.1	143.7	1437.8	1430.8
33 2021	0.0	0.0	0.0	7.0	7.0	1393.7	154.8	1548.5	1541.5
34 2022	0.0	0.0	0.0	1.7	1.7	375.3	41.7	417.0	415.3

Unit NRS. million

Table 12.13 (3) Economic Cost and Benefit (Case 3)

Year	Construction Cost		O&M cost	Replacement Cost	Cost Total	VOC Saving Benefit	Time Cost Saving Benefit	Benefit Total	B-C
	F.C.	L.C.							
1 1989	61.9	0.0	61.9	0.0	61.9	0.0	0.0	0.0	-61.9
2 1990	287.8	41.9	329.7	0.0	329.7	0.0	0.0	0.0	-329.7
3 1991	372.1	52.6	424.7	0.0	424.7	0.0	0.0	0.0	-424.7
4 1992	435.0	54.8	489.8	0.0	489.8	0.0	0.0	0.0	-489.8
5 1993	371.9	48.6	420.5	0.0	420.5	0.0	0.0	0.0	-420.5
6 1994	202.8	27.5	230.2	1.2	231.5	34.5	3.0	37.5	-194.0
7 1995	286.9	42.7	329.6	1.7	331.3	49.5	4.3	53.8	-277.5
8 1996	297.9	52.7	350.6	1.7	352.3	53.3	4.6	57.9	-294.4
9 1997	336.9	52.0	388.9	1.7	390.6	57.4	4.9	62.3	-328.3
10 1998	389.5	46.9	436.4	1.7	438.0	61.8	5.3	67.1	-370.9
11 1999	235.8	31.2	266.9	1.7	268.6	66.5	5.7	72.2	-196.4
12 2000	60.6	4.8	65.4	5.6	71.0	228.3	20.7	249.0	178.0
13 2001	0.0	0.0	0.0	7.0	7.0	304.1	28.3	332.4	325.4
14 2002	0.0	0.0	0.0	7.0	7.0	329.6	31.6	361.2	354.2
15 2003	0.0	0.0	0.0	7.0	7.0	357.3	35.3	392.6	385.6
16 2004	0.0	0.0	0.0	7.0	7.0	387.3	39.4	426.7	419.7
17 2005	0.0	0.0	0.0	7.0	7.0	419.8	44.0	463.8	456.8
18 2006	0.0	0.0	0.0	7.0	7.0	455.1	49.1	504.2	497.2
19 2007	0.0	0.0	0.0	7.0	7.0	493.3	54.8	548.1	541.1
20 2008	0.0	0.0	0.0	7.0	7.0	534.7	61.2	595.9	588.9
21 2009	0.0	0.0	0.0	7.0	7.0	579.6	68.3	647.9	640.9
22 2010	0.0	0.0	0.0	7.0	7.0	628.3	76.2	704.5	697.5
23 2011	0.0	0.0	0.0	7.0	7.0	676.7	82.1	758.8	751.8
24 2012	0.0	0.0	0.0	7.0	7.0	728.8	88.4	817.2	810.2
25 2013	0.0	0.0	0.0	7.0	7.0	784.9	95.2	880.1	873.1
26 2014	0.0	0.0	0.0	7.0	7.0	845.3	102.5	947.8	940.8
27 2015	0.0	0.0	0.0	7.0	7.0	910.4	110.4	1020.8	959.0
28 2016	0.0	0.0	0.0	7.0	7.0	980.5	118.9	1099.4	1092.4
29 2017	0.0	0.0	0.0	7.0	7.0	1056.0	128.1	1184.1	1177.1
30 2018	0.0	0.0	0.0	7.0	7.0	1137.3	138.0	1275.3	1268.3
31 2019	0.0	0.0	0.0	7.0	7.0	1224.9	148.6	1373.5	1366.5
32 2020	0.0	0.0	0.0	7.0	7.0	1319.2	160.0	1479.2	1472.2
33 2021	0.0	0.0	0.0	7.0	7.0	1420.8	172.3	1593.1	1586.1
34 2022	0.0	0.0	0.0	7.0	7.0	1530.2	185.6	1715.8	1708.8
35 2023	0.0	0.0	0.0	7.0	7.0	1648.0	199.9	1847.9	1840.9
36 2024	0.0	0.0	0.0	7.0	7.0	1774.9	215.3	1990.2	1983.2
37 2025	0.0	0.0	0.0	1.7	1.7	477.9	58.0	535.9	534.2

Unit MRS. million

Table 12.13 (4) Economic Cost and Benefit (Case 4)

Unit NRS. million

Year	Construction Cost		O&M cost	Replacement Cost	Cost Total	VOC Saving Benefit	Time Cost Saving Benefit	Benefit Total	B-C
	F.C.	L.C.							
1 1989	31.0	0.0	31.0	0.0	31.0	0.0	0.0	0.0	-31.0
2 1990	206.6	31.6	238.2	0.0	238.2	0.0	0.0	0.0	-238.2
3 1991	305.3	46.0	351.3	0.0	351.3	0.0	0.0	0.0	-351.3
4 1992	288.8	34.6	323.4	0.0	323.4	0.0	0.0	0.0	-323.4
5 1993	438.7	66.4	505.1	0.0	505.1	0.0	0.0	0.0	-505.1
6 1994	573.4	80.8	654.2	1.2	655.4	34.5	3.0	37.5	-617.9
7 1995	513.3	72.5	585.8	1.7	587.5	49.5	4.3	53.8	-533.7
8 1996	462.0	66.8	528.8	1.7	530.5	53.3	4.6	57.9	-472.6
9 1997	461.9	51.7	513.6	1.7	515.3	57.4	4.9	62.3	-453.0
10 1998	58.2	5.0	63.3	5.6	68.9	194.5	16.6	211.1	142.2
11 1999	0.0	0.0	0.0	7.0	7.0	258.6	22.1	280.7	273.7
12 2000	0.0	0.0	0.0	7.0	7.0	280.5	25.4	305.9	298.9
13 2001	0.0	0.0	0.0	7.0	7.0	304.1	28.3	332.4	325.4
14 2002	0.0	0.0	0.0	7.0	7.0	329.6	31.6	361.2	354.2
15 2003	0.0	0.0	0.0	7.0	7.0	357.3	35.3	392.6	385.6
16 2004	0.0	0.0	0.0	7.0	7.0	387.3	39.4	426.7	419.7
17 2005	0.0	0.0	0.0	7.0	7.0	419.8	44.0	463.8	456.8
18 2006	0.0	0.0	0.0	7.0	7.0	455.1	49.1	504.2	497.2
19 2007	0.0	0.0	0.0	7.0	7.0	493.3	54.8	548.1	541.1
20 2008	0.0	0.0	0.0	7.0	7.0	534.7	61.2	595.9	588.9
21 2009	0.0	0.0	0.0	7.0	7.0	575.9	65.9	641.8	634.8
22 2010	0.0	0.0	0.0	7.0	7.0	620.2	71.0	691.2	684.2
23 2011	0.0	0.0	0.0	7.0	7.0	668.0	76.5	744.5	737.5
24 2012	0.0	0.0	0.0	7.0	7.0	719.4	82.4	801.8	794.8
25 2013	0.0	0.0	0.0	54.8	61.8	774.8	88.7	863.5	801.7
26 2014	0.0	0.0	0.0	7.0	7.0	834.5	95.5	930.0	923.0
27 2015	0.0	0.0	0.0	7.0	7.0	898.8	102.9	1001.7	994.7
28 2016	0.0	0.0	0.0	7.0	7.0	968.0	110.8	1078.8	1071.8
29 2017	0.0	0.0	0.0	7.0	7.0	1042.5	119.3	1161.8	1154.8
30 2018	0.0	0.0	0.0	7.0	7.0	1122.8	128.5	1251.3	1244.3
31 2019	0.0	0.0	0.0	7.0	7.0	1209.3	138.4	1347.7	1340.7
32 2020	0.0	0.0	0.0	7.0	7.0	1302.4	149.1	1451.5	1444.5
33 2021	0.0	0.0	0.0	7.0	7.0	1402.7	160.6	1563.3	1556.3
34 2022	0.0	0.0	0.0	7.0	7.0	1510.7	173.0	1683.7	1676.7
35 2023	0.0	0.0	0.0	1.7	1.7	406.8	46.6	453.4	451.7

12.6 Sensitivity Analysis

Sensitivity analysis was conducted to check the robustness of the evaluating system and to get information about the priority among the cases. The analysis was conducted for the conceptual cases in which different levels of benefit and cost were assumed.

The results are shown in Table 12.14.(1), (2), (3), (4). From them, it could be said the evaluating system is fairly robust since that changes in cost and/or benefit do not affect the result of economic indicators to the extent that alters the order among the cases. At any level of cost and benefit, case 4 comes up with the greatest values of economic indicators.

Table 12.14 (1) Result of Sensitivity Analysis (Case 1)

IRR							(%)
Benefit	Cost						
	20% up	10% up	Original	10% down	20% down		
20% up	8.72	9.38	10.13	10.98	11.97		
10% up	8.07	8.72	9.45	10.28	11.24		
Original	7.39	8.01	8.72	9.53	10.46		
10% down	6.64	7.25	7.94	8.72	9.62		
20% down	5.84	6.43	7.10	7.85	8.72		

B/C						
Benefit	Cost					
	20% up	10% up	Original	10% down	20% down	
20% up	1.102	1.202	1.323	1.470	1.653	
10% up	1.010	1.102	1.212	1.347	1.515	
Original	0.918	1.002	1.102	1.225	1.378	
10% down	0.827	0.902	0.992	1.102	1.240	
20% down	0.735	0.802	0.882	0.980	1.102	

NPV							(Million NRs.)
Benefit	Cost						
	20% up	10% up	Original	10% down	20% down		
20% up	373.3	678.0	982.6	1,287.2	1,591.9		
10% up	37.6	342.2	646.9	951.5	1,256.1		
Original	-298.2	6.5	311.1	615.7	920.4		
10% down	-633.9	-329.3	-24.6	280.0	584.6		
20% down	-969.7	-665.0	-360.4	-55.7	248.9		

Table 12.14 (2) Result of Sensitivity Analysis (Case 2)

IRR (%)					
Benefit	Cost				
	20% up	10% up	Original	10% down	20% down
20% up	9.70	10.37	11.13	11.99	13.00
10% up	9.05	9.70	10.44	11.28	12.25
Original	8.36	8.99	9.70	10.52	11.46
10% down	7.61	8.22	8.92	9.70	10.62
20% down	6.80	7.39	8.06	8.82	9.70

B/C					
Benefit	Cost				
	20% up	10% up	Original	10% down	20% down
20% up	1.261	1.376	1.513	1.681	1.892
10% up	1.156	1.261	1.387	1.541	1.734
Original	1.051	1.146	1.261	1.401	1.576
10% down	0.946	1.032	1.135	1.261	1.419
20% down	0.841	0.917	1.009	1.121	1.261

NPV (Million NRs.)					
Benefit	Cost				
	20% up	10% up	Original	10% down	20% down
20% up	855.9	1,129.0	1,402.2	1,675.4	1,948.5
10% up	511.4	784.6	1,057.7	1,330.9	1,604.0
Original	166.9	440.1	713.2	986.4	1,259.6
10% down	-177.6	95.6	368.7	641.9	915.1
20% down	-522.1	-248.9	24.3	297.4	570.6

Table 12.14 (3) Result of Sensitivity Analysis (Case 3)

IRR (%)

Benefit	Cost				
	20% up	10% up	Original	10% down	20% down
20% up	9.57	10.18	10.86	11.64	12.53
10% up	8.97	9.57	10.24	11.00	11.87
Original	8.33	8.92	9.57	10.31	11.16
10% down	7.63	8.21	8.85	9.57	10.40
20% down	6.87	7.43	8.06	8.76	9.57

B/C

Benefit	Cost				
	20% up	10% up	Original	10% down	20% down
20% up	1.261	1.376	1.513	1.681	1.892
10% up	1.156	1.261	1.387	1.541	1.734
Original	1.051	1.146	1.261	1.401	1.576
10% down	0.946	1.032	1.135	1.261	1.419
20% down	0.841	0.917	1.009	1.121	1.261

NPV

(Million NRs.)

Benefit	Cost				
	20% up	10% up	Original	10% down	20% down
20% up	821.9	1,084.3	1,346.7	1,609.1	1,871.5
10% up	491.0	753.4	1,015.8	1,278.2	1,540.6
Original	160.1	422.5	684.9	947.3	1,209.7
10% down	-170.8	91.6	354.0	616.4	878.8
20% down	-501.7	239.3	23.1	285.5	547.9

Table 12.14 (4) Result of Sensitivity Analysis (Case 4)

IRR (%)

Benefit	Cost				
	20% up	10% up	Original	10% down	20% down
20% up	9.88	10.53	11.26	12.10	13.07
10% up	9.24	9.88	10.59	11.41	12.35
Original	8.56	9.18	9.88	10.67	11.58
10% down	7.83	8.43	9.11	9.88	10.76
20% down	7.04	7.62	8.28	9.02	9.88

B/C

Benefit	Cost				
	20% up	10% up	Original	10% down	20% down
20% up	1.301	1.419	1.561	1.735	1.952
10% up	1.193	1.301	1.431	1.590	1.789
Original	1.084	1.183	1.301	1.446	1.626
10% down	0.976	1.064	1.171	1.301	1.464
20% down	0.867	0.946	1.041	1.156	1.301

NPV

(Million NRs.)

Benefit	Cost				
	20% up	10% up	Original	10% down	20% down
20% up	962.6	1,229.1	1,495.6	1,762.1	2,028.6
10% up	615.9	882.4	1,148.9	1,415.4	1,681.9
Original	269.2	535.7	802.2	1,068.7	1,335.2
10% down	-77.5	189.0	455.5	722.0	988.5
20% down	-424.2	-157.7	108.8	375.3	641.8

CHAPTER 13 FORESEEABLE EFFECTS ON SOCIOECONOMY, AGRICULTURE,
REGIONAL FOUNDATION, AND NEGATIVE IMPACT

13.1 General

Economic importance of road construction projects is largely attributed to multiplier effects to the economy. The positive effects estimated in the previous chapter are only part of them, named "direct effects". There are many other "indirect effects". Indirect effect is quite important in the sense that road projects give impetus to regional development in many aspects of economic activity.

Especially, in such case as the road is first introduced into the area which has no modern transportation at all the nature and kind of effect brought about by road becomes a guideline to decide the direction of future regional development.

It is widely known that the impetus given by the construction of road and/or railway in the regional development was quite significant in the process of nation's economic "take off" in the history of the advanced countries in the world.

In this respect, the indirect effects, which would be brought about by the Project Road should be carefully fostered and utilized so as to direct them for the further development of the nation.

As usually known, the indirect effects of road have two different streams in their directions, viz. forward and backward directions of the effect. In terms of economics, the former is referred to as "Forward Linkage Effect", and the latter is referred to as "Backward Linkage Effect". The following are interpretation about them:

- Forward Linkage Effects

The effect generated before the completion of the Project Road is called "Forward Linkage Effect". A representative one is multiplier effect of the investment. The local portion of investment for the Project Road is estimated at some NRs. 500 million (in 1988 price level). When portions of these amounts are invested annually during the period of construction, those amount would induce another investment and/or consumption which in turn would trigger a series of investment and/or consumption. This effect is not limited in a certain locality and will prevail in the other parts of the nation. In addition to the above, the Project Road requires averagely 5,000 to 10,000 persons a day during the construction period. These employments as well would stimulate the economy by way of increasing income and consumption.

- Backward Linkage Effect

The effect generated after completion of the project is called "Backward Linkage Effects", "development effect" is mostly observed in this category.

In any case, the effects of the Project Road are quite useful for the nation building as long as these effects are utilized in a manner of coordination with the targets for nation building. The conceivable effect brought about by the Project Road is illustrated in Fig. 13.1.

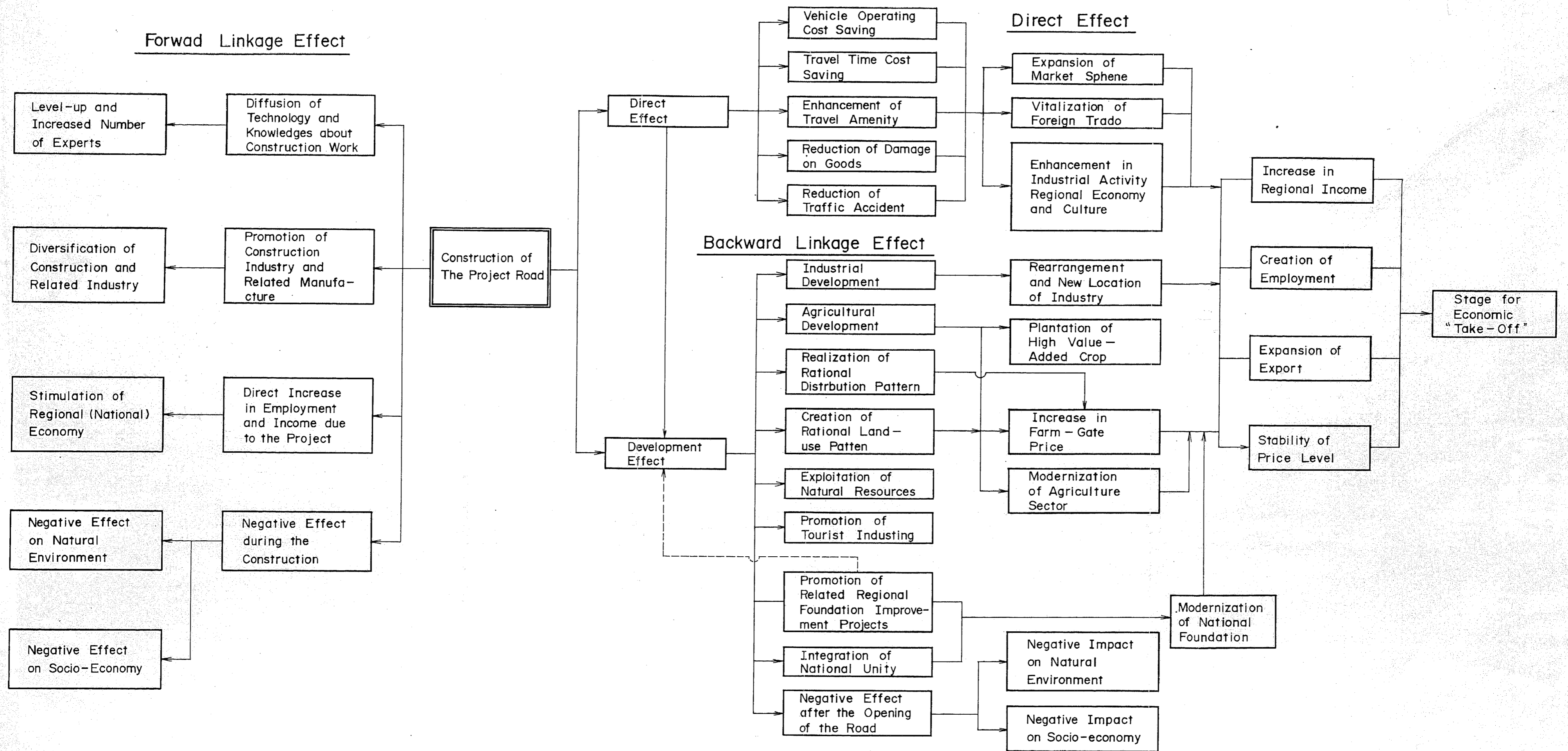


Fig.13.1 Foreseeable Effects by The Project Road

