APPENDIX I

Project Cost and Construction Data (Construction phase)

Total length: 110 kms (Lamosangu - Jiri)

Construction start/end: March 1976/May 1985

Total project cost: NC 250 Million

(This amount does not include the expenses for the foreign experts)

The financing of the project is as follows:

- Switzerland	88.0 %	NC 220 million
- Nepal	9.5 %	NC 24 "
- WFP (partial investment of sales proceeds)	2.5 %	NC 6 "

The total cost can be split according to the different construction activities:

	%	NC per km	NC total
- Earthwork	30	0.69 million	75.9 million
- Water management/ erosion control	17	0.39 "	42.9 "
- Layerwork	12	0.27 "	29.7 "
- Blacktop	26	0.58 "	64.1 "
- Bridges/buildings/ equipment/maintenance/ administration	15	0.34 "	37.4 "
Total	100	2.27 "	250.0 "

On the other hand, it can be split according to labour, material and supervision:

	%	NC total
- Construction execution *	60	150.2 million
- Construction material **	19	46.7 "
- equipment	3	7.4 "
- Spare parts	2	5.6 "
- Engineering	2	4.6 "
- Administration	14	35.5 "
Total	100	250.0 "

* The following works and structures were executed:

- Earthwork	3,078,000 m^3
- Walls (gabion, cement and dry masonry)	371,000 m^3
- Culverts	526 nos
- Causeways	46 nos
- Hairpin bends	70 nos
- Major bridges (72 m span each)	2 nos
- Minor bridges (8-12 m span)	5 nos

** The following construction material was consumed:

- Cement	4,000 mt
- Gabion wire	2,200 mt
- Bitumen emulsion	3,700 mt
- Explosives	100 mt
- Gravel (stone soling/layerwork/blacktop)	190,000 mt

A very important question in the context of labour intensive road construction for the benefit of the local population is how much of the total investment went directly to the project region in the form of payments to labourers. In this connection, it is of specific interest to know that during our peak construction season (981/82) we had up to 9,000 labourers working at a time. The following figures show the overall money flow destinations (Lit. 3):

- Abroad	41 %	NC 103 million
- Kathmandu	27 %	NC 67 "
- Project area	32 %	NC 80 "
Total	100 %	NC 250 million

In other words, inspite of the labour intensive construction concept, only 1/3 of the total investment went directly into the project region and not even 2/3 to Nepal.

It is interesting to split these figures according to the type of construction work:

Type of Work	Abroad	Kathmandu	Project Area
- Earth work			
. big contracts	32 %	32 %	36 %
. piece contracts	30 %	20 %	50 %
- Water management	44 %	31 %	25 %
- Layer works	44 %	31 %	25 %
- Blacktop	60 %	24 %	16 %
- Bridges	70 %	10 %	20 %

The high figures for money flow abroad are to be explained mostly by the procurement of cement, gabion wire, explosives, and bitumen emulsion. It is, on the other hand, evident that the piece contract system gives the highest possible labour intensity. Very informative is the comparison of construction cost with other hillroad projects in Nepal (Lit. 9):

Project	Road type/ surface	Length	Construction period	Cost/km
Narayanghat-Muglin-Gorkha	2-lane/ paved	61 kms	1978-1981	NC 5.4 million
Dharan-Dhankuta	2-lane/ paved	51 kms	1976-1984	NC 8.4 "
Lamahi-Ghorai	1-lane/ gravel	26 kms	1976-1984	NC 2.2 "
Lamosangu-Jiri	1-lane/ paved	110 kms	1976-1985	NC 2.2 "

This comparison shows in real terms that the LJRP investment was the lowest per km investment inspite of its inclusion of a policy directed to: "Invest a bit more (construction phase) to benefit later on (maintenance phase)"!

Finally, a look back to the first cost estimate (1973) shows how this project has developed in terms of adaptation to changed circumstances and cost overrun:

- Initial cost estimate (1973) NC 94 million
- Revised cost estimate (1980) NC 225 million

The vast difference of NC 131 million (139% increase) was due to the following:

. increase in road length by 5 kms	NC 4.5 million
. increase in road width by 0.6-1.0 m	NC 14.7 "
. inflation and running fixed cost between 1973 and 1985	NC 43.6 "
. inclusion of Sun Kosi Bridge	NC 3.6 "
. large scale erosion protection work	NC 7.7 "
. inclusion of blacktopping of section km 0-71.5	NC 41.5 "
. reinforcement of road base between Lamosangu and Kharidhunga due to mine	NC 4.9 "
. land compensation along the entire road length	NC 7.7 "
. maintenance of completed road sections till 1985	NC 2.8 "
Total	NC 131.0 "

- Construction cost NC 250 million

The difference of NC 25 million (11% increase) against the revised cost estimate was mainly due to:

. inclusion of blacktopping of section km 71.5 - 110	NC 25 million

APPENDIX II

First Visible Impact of the Road

During the construction the discussion among the Swiss concerned with technical cooperation activities never stopped as to whether the impact of the road should be judged as being in general more negative than positive, an opinion which was strongly nourished by the publication of the book "Nepal in Crisis" (Lit. 10).

To get answers to this crucial aspect, as well as to many other open questions concerning impact of the IHDP, the DDC decided to conduct an impact monitoring study for both the projects. This study started in 1986 and will last for 10 years.

But it is already today possible to give a few definite answers which can roughly be divided into two impact groups:

- Positive visible impact:
  - Substantial income has been generated,
  - Construction activities along the road have been enormously increased (shops, teashops, lodges, workshops, etc.),
  - Basic consumer goods like kerosene, sugar, salt, are cheaper than before,
  - The project region became much more attractive for government officials (e.g. teachers, doctors) due to the improved communication with Kathmandu,
  - Services have been increased,
  - The present road traffic volume is already twice as large as estimated.
- Impact with side effects on environment:
  - The remaining forests of the area are now more endangered by the easy road access,
  - The LJR has become the basis of some local access roads to adjoining regions,
  - The exploitation of the magnesite mine at Kharidhunga became feasible and is in full swing today.

It is evident, that depending on the angle from which one looks at it, positive impact may have negative aspects and vice versa (e.g. the easy road access to the forests could be used as the basis of the implementation of a forest management system).