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**The Effects of Roads in
West Central Nepal**

PART I (Summary)

by

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**A Report to ESCOR.
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PREFACE

Each year the Overseas Development Administration (ODA) commissions a number of ex-post evaluation studies with two aims in mind; firstly, to assess the effectiveness of its aid activities and secondly, to learn lessons for improving the effectiveness of future aid activities.

This evaluation is one such study.

Evaluation studies are undertaken by individuals or by teams especially recruited for their particular knowledge with regard to the subject under study. Sometimes these teams will include personnel from ODA (increasingly teams are a mix of ODA and external personnel).

In all cases the reports and conclusions are attributable to the authors, who are finally responsible for their contents, and not to ODA.

Evaluation Unit
Manpower and Evaluation Department

THE EFFECTS OF ROADS IN WEST CENTRAL NEPAL:° PART ONE

by

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***This first part of the final report to ESCOR, Ministry of Overseas Development, should be read in conjunction with the paper 'Preliminary Report on Roads and Agricultural Change in the West Central Planning Region of Nepal', by David Feldman and Alain Fournier. That preliminary report is attached as an appendix to this document.**

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CHAPTER ONE: THE NEPAL ROADS RESEARCH PROJECT AND
ROAD EVALUATION

1. The Nepal Roads Research Project and Final Report

This is the first part of a report produced by five members of the Overseas Development Group at the University of East Anglia, all of whom were co-directors of the ODG's Nepal Roads Research Project designed to evaluate the economic and social effects of road construction in the hills and plains of West Central Nepal. The research was funded by the Ministry of Overseas Development, through the Economic and Social Committee for Overseas Research (ESCOR), but the views expressed in the report are those of the research team alone and do not necessarily reflect either those of the Ministry as a whole or those of individuals within the Ministry.

The central concern of the Project with the effects of road provision stems from the interest expressed by the Ministry of Overseas Development in obtaining a general evaluation of the economic and social effects of the construction of a section of the Mahendra Rajmarga (the East-West Highway) through the plains region (the terai) undertaken by the Department of the Environment as part of the British aid programme in Nepal. Discussions between members of the research team and His Majesty's Government of Nepal in April 1973 led to the inclusion of two other roads within the scope of the project: the Siddhartha Rajmarga, connecting the hill centre of Pokhara with the terai and thence with India, and the Prithivi Rajmarga, connecting Pokhara with the capital, Kathmandu (see figure 1). One of the arguments for including the two additional roads derived from the stated concern of HMS that the building of roads linking different, and unequal, regions should have the effect of reducing inequalities between those regions and also, through the more general economic and

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social impact of road provision, between different sections of the population within each region. Another argument for the inclusion of all three roads was the early realisation that the effects of road provision would probably only be fully revealed in five years or more after the opening of the road and not at the period of time around the opening itself. The Siddartha Rajmarga had been opened to motorised traffic six years previously.

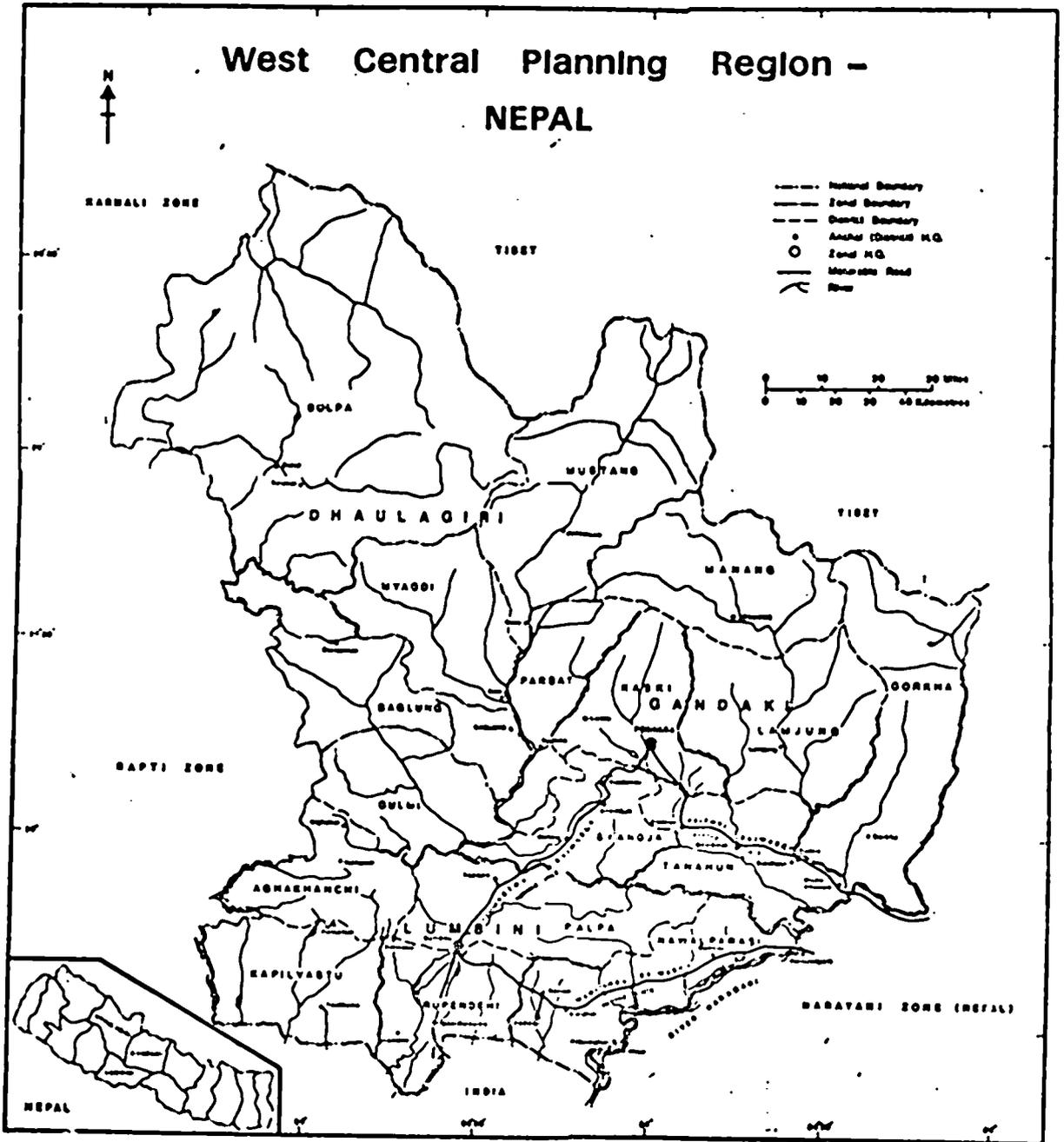
Given the revised objective and scope of the research project, agreed by the Ministry of Overseas Development - namely, to investigate the economic and social effects of the construction of these three roads, with particular reference to spatial and social inequality - the west central planning region (consisting of three administrative zones: Dhaulagiri in the north, Gandaki in the central and northern hills, and Lumbini to the south) provided the initial 'study area'. This final report to the Ministry of Overseas Development is therefore entitled The Effects of Roads in West Central Nepal.

The report as a whole, including Parts One and Two (comprising four volumes in all), while presenting a substantial body of original data, a detailed analysis of the economic and social effects of road provision, a broader contextual analysis of the political economy of Nepal, and certain specific conclusions, does not represent the totality of material collected and analysed within the broad framework of the Nepal Roads Research Project. The reader of this first part of the report on The Effects of Roads in West Central Nepal is also referred to the annotated bibliography at the end of this volume entitled 'Published and Unpublished Work of the Nepal Roads Research Project'.

Part One was requested by the steering committee of the ESCOR as a means of providing an introduction to the theoretical approach, the central arguments and the findings of the Nepal Roads Research

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Project, developed in more detail in the main body of the report - Part Two. It cannot therefore be considered as a separate document but rather as essentially indicative of the general direction of argument and of the broad conclusions reached in the second part of the report. It should, therefore, be seen as a complement to and not a substitute for the main body of the report on The Effects of Roads in West Central Nepal.

In this volume (Part One) we first discuss, in Chapter 1, the ways in which road construction has been evaluated in the past and conclude that many of the most important and logically prior decisions regarding the provision of roads are made independently of and outside conventional formal evaluation procedures. Furthermore, the many unwarranted value judgments on which the formal evaluation is frequently based reduce it all too often to a narrow technical exercise of dubious value. In Chapter 2 we outline the situation in Nepal to reveal the wider context within which road provision, and other investments of a complementary nature - such as agricultural extension, provision of new farm inputs and official 'support' agencies, are planned and implemented. Chapter 3 is concerned with the provision of roads in the context of the rural economy and society, while Chapter 4 concentrates on the changes in urban economy and society in relation to road provision. Chapter 5 presents our conclusions, considers the prospect for Nepal in general in the future and the role of roads in particular.

2. The need for a comprehensive approach in road evaluation

Since 1973, when the Nepal Roads Research Project was conceived

and designed, a number of studies, written for major aid-giving agencies, have been produced which consider the role of roads and road construction in the process of economic and social change; the majority of these stress the very limited nature of the effects attributable to road provision, particularly in the least developed countries, and contrast strikingly with the optimistic estimations of probable induced positive changes expressed in most ex ante feasibility studies and appraisals. There have also been suggestions that large investments and major capital projects not only can have a limited effect upon the productive forces and their development but in some circumstances may actually have serious negative economic and political effects. In view of the comparative scarcity of detailed ex-post studies of the effects of major investment and capital projects, this particular evaluation of the provision of roads in one of the least developed countries in the world should provide important evidence for this debate. It should be seen, not only as a case study of the situation in one region of one country - although we hope that it will prove useful as such - but also as an attempt to develop a broad theoretical approach to the analysis of the effect of large investments in infrastructural development in underdeveloped countries. We hope that the report will be of interest and utility both to aid donors, whether national or international, and to the recipients of aid more generally, as well as to those concerned with the serious predicament of Nepal.

It is important to note at the outset the real danger that the proposition 'roads equal development', now increasingly regarded as misleading or simply wrong, will simply be replaced by 'roads plus expenditure on agricultural extension equal development', which holds little more applicability than the first proposition for the simple reason that both the provision of roads (as a choice of

priority and with regard to their location, quality and alignment), as well as agricultural extension are determined by the political economy of the country in question. Only by making use of a framework which explicitly incorporates 'economic', 'political' and 'social' factors within an integrated dynamic system can an adequate understanding be achieved, and an appropriate policy devised.

It is perhaps inevitable that the implications of such an approach will be somewhat uncomfortable for policy-makers, in part because the policy-makers themselves are then included within the analysis rather than treated as a wholly 'rational' deus ex machina standing above and outside the political economy within which groups combine and re-combine in a subtly shifting pattern to defend and promote their interests, and in part because such an approach implies that the narrow economic and wholly quantitative techniques of most current appraisal studies must be qualified and the usual ceteris paribus conditions themselves questioned, so that the apparent 'objectivity' of such techniques will be thrown into doubt.

If the report also includes within its scope the activities of certain aid-giving countries and agencies it is because it is felt that these too are an inextricable element in the political economy of Nepal. The report will claim, for example, the importance of the international military and strategic situation as well as broader diplomatic and political considerations in Indian and Chinese aid programmes and argue, more generally, that foreign donors are rarely disinterested in the form aid takes in the recipient country, the case of road construction being the example upon which the report concentrates. Even such a champion of orthodox economics as Milton Friedman has questioned the United States' economic aid programme (although admittedly from a very different theoretical standpoint from that adopted here) and, in arguing for 'free trade' against aid,

has suggested that "the argument for economic aid ... is sometimes used as a rationalisation to permit straight military or political subsidies to be made under a different label" (Friedman, 1970: 65).

In the light of the preceding remarks the reader should not be surprised to find no attempts within this report to apply a variety of quantitative parameters of income distributions for inclusion in conventional cost-benefit analysis. The report is concerned rather to demonstrate the structural factors responsible for a) the relative lack of response in the sphere of production to the provision of roads, b) the maintenance, at best, of existing spatial and social inequalities, and c) the absence of any significant accumulation and reinvestment in productive enterprise, despite the hope expressed by the Nepalese government in their Fourth Five Year Plan that road provision would reduce inequalities and stimulate production in both industry and agriculture. The report is also concerned to explain the factors underlying the Nepalese government's interest in road construction programmes and the emphasis laid on transport development by many aid donors in the case of Nepal.

3. The UNDP Road Feasibility Study for Nepal

As an example of some of the possible shortcomings of the conventional approach to road evaluation, and as an introduction to the provision of roads in Nepal, the UNDP Road Feasibility Study is briefly discussed here to support our claim that a comprehensive approach is essential in the study of the effects of roads and other complementary inputs, and to emphasise the necessity of evaluating major projects as an exercise in political economy rather than imaginative accounting or expensive 'rubber-stamping'.

In 1970 a team of consultants was contracted by the UNDP to conduct a road feasibility study for Nepal at a projected cost of Rs.11 million (about £½ million). This road feasibility study raises four major issues which demonstrate the difficulties of applying the theory of cost benefit analysis in a concrete situation.

These are:-

- (a) The problem of the field of comparison, i.e. comparing alternative investments across sectors, space, time and projects;
- (b) The representativeness of prices as indicators of resource allocation;
- (c) Assumptions concerning the diffusion of innovations when attempting to estimate induced indirect costs and benefits;
- (d) The treatment of non-quantifiable benefits and costs, and the problem of ranking projects.

(a) The problem of the field of comparison

The UNDP Road Feasibility Study, like many appraisals, is a comparative exercise. The aim is to rank possible highway construction projects throughout Nepal. But highway construction is only a sub-set of the possible choices available for the allocation of aid and domestic funds. The terms of reference for the feasibility study therefore were themselves the product of a prior decision of much greater importance. The criteria used for this prior decision are crucial but are only expressed in aggregate planning documents and take the form of slogans rather than carefully documented proposals. For instance, the Fourth Plan (1970-75) explained the allocation of 35% of total expenditure to transport and communications largely on the grounds that:

"The infusion of development ideas in (inaccessible) regions depends largely on the availability of adequate transportation.

It is only through transport expansion that the development projects of all types can flourish together through mutual co-ordination and integration."

(Fourth Plan (1970-1975) 1972,
p. 118)

The quantitative implications of such statements are not made explicit but do have a semblance of measurability, even if there is no evidence that such measurement has been carried out. On the other hand, an objective of transport provision such as:

"To help strengthen, promote and protect the constitutional system, nation and nationality, together with territorial integrity "

(Fourth Plan (1970-1975) 1972,
p. 119)

does not easily lend itself to quantification and indicates the application of broadly political 'ranking' criteria in allocation between sectors not taken into account in conventional appraisals. Thus the selection of sectors for appraisal rests upon criteria which themselves remain generally unquestioned and unappraised, filtered through a complex network of vested interests which are then presented to potential aid-donors for consideration or for project appraisal as terms of reference. In such circumstances project appraisal may only perform a 'rubber-stamping' function giving an unwarranted seal of approval to sectoral concentrations resting on other criteria. The paradox of an appraiser ardently seeking possible future benefits for one project in a situation where the direct benefits of equal expenditure in the same area on another project in an unfavoured sector might yield higher aggregate benefits is certainly a possibility, and we would argue that it has occurred in practice in Nepal. This paradox can produce a devaluation of the activity of appraisal altogether. For example, the Road Feasibility Study found that, taking account of savings on existing movements and a measure of increased production in agriculture, roads in the hills were unjustified

compared to roads in the plains (or terai). However, since the terms of reference only related to roads and the Nepalese refused to accept the conclusions of the report, the following paragraph was included in a sequence of non-quantified benefits:

"Finally, but perhaps most important, is the estimate of non-quantifiable benefits identifiable in government economic development plans in general and transport in particular. For instance, if the area served by a link coincides with a growth axis, this link will certainly have important non-quantifiable benefits, since its construction will enhance the overall economic strategy of the country."

(UNEP Road Feasibility Study,
1973, p. 2.13)

The final version of the Road Feasibility Study perhaps could have ended 'Q.E.D.' although the reasoning resembles a tautology rather than a theorem. This criticism is not intended to deny the great importance of "non-quantifiable" benefits and costs in general, but we recognise a tendency to give prominence in project appraisal to certain types of benefit "for no other reason than there exists a reasonably satisfactory method of measurement" (Sychrava, 1968). The central elements of the UNEP feasibility study were amenable to measurement and consisted of:

- (i) benefits due to reduction of transport costs;
- (ii) social cost of unemployed porters, offset by employment for carrying increased trade and road construction and maintenance.

The overall field of comparison suffered from a narrow concentration on a few quantifiable benefits and costs within a single sector; and even the conclusions derived from this limited approach were then overridden by a nebulous and under-specified benefit included when the original results proved politically unpalatable.

Within these limitations the comparative scope of the feasibility study was wide, embracing as it did the whole of Nepal and as long a

time-period as necessary (discounted at 10% p.a.). The study approached the problem of heterogeneity within the major ecological zones by grouping Districts where the proportions of main crops grown were similar (in terms of percentages of total output). Given that the study also considered the influence of roads to be confined to a narrow corridor, the applicability of the method requires uniformity across Districts which even to the casual observer does not exist. However, this approach allowed the study to substitute space for time and compare the situation in 'similar' Districts with reference to roads constructed at different times. This approach allows a time profile of road impact to be constructed, subject to the effectiveness of attempts to control for inter-District variation. The time profile suggested that "the effect of a road during the first few years of its existence is rather limited" (UNDP Road Feasibility Study, 1973, p. 5.103), amounting to real increases in net output per cultivated hectare of under 1% per annum in the first ten years for all situations, rising to a maximum of between 1.06% per annum in the hills and 1.25% per annum in the terai (or plains) around the fifteenth year after construction. We acknowledge that the wide spatial and temporal fields of comparison do have advantages in respect of this methodology, and the ability to compare aggregate advantages of various transport networks which may exceed the sum of the advantages of components. The method would have been improved, however, by an analysis of spatial heterogeneity and, more importantly, of the factors underlying the large observed productivity differences.

In general, though, we consider that this approach has serious limitations. Firstly, it fails to consider the fundamental reasons for such a low response rate to road provision. Secondly, it discounts

time at much too low a rate, given that most experts agree that Nepal faces a crisis of major proportions in the near future, which further implies that the bland space-time substitutions the study makes, ingenious though they may be technically, are quite unjustified.

(b) The representativeness of prices

Cost benefit analysis using current market prices is in theory valid only in situations where the impact of investment does not give rise to any price changes (or in practice only small price changes) which might be caused by the changes in quantities produced or consumed. A projected fall in transport costs by a factor of about eight (which is the situation in Nepal) may be expected to affect relative prices considerably and hence real incomes. But this problem is small compared with the general 'second-best' situation which the current market prices represent and which cost benefit analysis is forced to use. To assume that observed prices in Nepal are those that would exist under a hypothetical, perfect competitive general equilibrium seems more than a little heroic. Official intervention and monopolistic/monopsonistic influences appear to occur in many important markets and the processes of price information diffusion require investigation to establish whether such influences are indeed of no consequence. Although the feasibility study found that spatial price structures were broadly consistent with calculated transportation cost differences, the state subsidizes the transport costs of fertiliser and it is debatable whether this observation reflects or will reflect the relative costs that producers actually face in deciding how to allocate scarce resources. Without a fuller understanding of price formation (including initiatives by the state) and the implications of the resulting prices for production and

consumption decisions, we contend that predictions of benefits based on assumptions of perfect competition are suspect. Adjusted prices are not in general used in the feasibility study except for the opportunity cost of self-carriers and the expression of value of commodities in kilograms of maize. The former exception yielded implied wages closely related to the wages of so-called professional porters in the same locality whilst the latter attempted to control for real incomes by assuming that maize was a universally produced and consumed commodity insensitive to transport cost changes. However both these calculations fail to question the validity of the underlying price structure and do not meet the criticism made above.

(c) The processes of diffusion of innovations

The assumptions concerning constant population growth and unchanging cropping strategies over the next twenty years made in the report are highly questionable especially as the dimensions of the crisis in Nepal are already clear. If the distribution of benefits across time is debatable, their distribution across space might be expected to rest on surer ground. The feasibility study distinguishes two levels of impact. The first is associated with user cost savings, that is 'direct' benefits, and extends throughout the area where significant transport cost reductions exist (this area being called the 'gravitation area'). The second is more restricted and corresponds to the corridor where improvements in production produce 'indirect' or 'induced' benefits. This area of influence from the point of view of the feasibility study was measured "on the basis of the diffusion area of technical means (of production) only" expressed in journey time, and implied that "the trend practically

drops to zero in areas more than one day distant from the road" (UNDP Road Feasibility Study, 1973, p. 4.3). The Cartesian distance implied by this travel time measure varies from less than two kilometres to about twenty-five kilometres. The emphasis on purely spatial, and the neglect of socio-economic, criteria for identifying the incidence of influence involves a gross simplification which omits any consideration of the mechanisms of diffusion associated with technical (or any other type of) innovation. This measure gives a total of two hundred thousand people envisaged as being within new 'areas of influence' created by the road construction programme proposed for West Central Nepal in the feasibility study. This was to be achieved at a cost, as envisaged in the Fourth Plan, of about Rs.50 million (which now represents about Rs.100 million as no construction was undertaken in that plan period). The sum corresponds to about Rs.3,000 per household in the 'area of influence', or to approximately the total amount earmarked for agricultural education and research in the Fourth Plan (Rs.55 million). As a final note to this section we conclude that if the heavy expenditure on roads is undertaken (whatever its costs and benefits), with such narrow corridors of influence in the hills, alignment then becomes a crucial choice. Indeed, the whole question of why influence areas are so small required investigation rather than simple acceptance - especially when indirect benefits are thought to be so important.

(d) The treatment of non-quantifiable benefits and costs,
and the ranking of projects

As a response to criticisms such as those made above there has been an increasing emphasis in project appraisal on ranking techniques which offer more flexibility than those deriving from social cost-

benefit appraisal methods. A report on another planning region of Nepal (by the Centre for Economic Development and Administration (CEDA)) suggested that since forecasts of future traffic flows were subject to wide margins of error, priority should be given to routes where existing traffic gave some hope that a road would break even. This suggests a lexicographic ordering with a break-even criterion as a first priority, followed by such non-quantified benefits as access to health and education facilities and non-quantified costs (resource losses through erosion of land used for agricultural purposes), and also consideration of the social distribution of costs and benefits and consequent tendencies of, for example, capital accumulation or malnutrition. A break-even criterion does not escape the above criticisms but does relegate the narrow economic calculations to a lesser role where prior decisions are not justified by dubious, or at worst spurious, complex calculations, which are costly in financial and skilled manpower terms. Also ranking criteria avoid the temptation to over-quantification of issues such as health and education where arguments about 'human capital' are only a part of the real issues involved. Similarly the issue of, firstly, distribution and, secondly, accumulation cannot be adequately parameterised because, for the first, measures of inequality have inconsistencies between themselves, and, for the second, highly aggregated propensities to save and invest alone tend to be critically under-identified. Also, however laudable criteria such as "the share of the poorest thirty per cent" appear, they also are arbitrary and may be sensitive to minor variations in the choice of cut-off point. Our conclusion is that, whilst ranking can mark an advance towards a fuller understanding of the impact of projects, project appraisal must be recognised as a complex art in which general

mathematical formulae cannot have universal applicability. Without an adequate detailed analysis of existing structures, negative appraisal is capable of being overridden by any expression of belief that qualitative changes will be miraculously induced by the proposed project. We would agree with economist E.J. Mishan who observed, with reference to the Rookill Report on a third London airport, that:

"Cost-benefit techniques are, indeed, becoming more sophisticated. But they may be too late to exert such influence in the choice of projects which can be related to the 'quality of life' issue. A Report such as the present, excellent as it is, paying lip service to right principles and secure within its terms of reference, may have the unexpected effect of contributing only to the public's growing impatience with economic expertise, and perhaps with economics in general."

(Mishan in Layard (ed), 1972, p. 471)

We do not think, however, that the remedy lies simply in further economic sophistication but rather in developing a theoretical approach capable of providing a fuller understanding of the interests of those affected by proposed projects and the means and opportunities for such interests to be expressed. It is within this context that we turn to a discussion of the situation in Nepal with specific reference to the provision of roads and their effects.

CHAPTER TWO: THE SITUATION IN NEPAL

1. The crisis

It is important, at the outset, to situate Nepal firmly among the other least-developed of the underdeveloped countries, because there is a real danger that, when examining in detail the particular circumstances of a given country or, as in the case of this report, of a single region within that country, both authors and readers stress the peculiarities of the specific situation investigated and underemphasise the features shared by the region or country concerned with others. Nepal is, of course, unique, as is every country; but the problems we identify and the fundamental economic and social structures we explore and explain in this and later chapters, from which those problems derive, are by no means wholly untypical and indeed share many common features with those of other underdeveloped countries. Nepal may be regarded, perhaps, as an extreme case, but one that has lessons for situations elsewhere in the underdeveloped world.

In 1971 twenty-five countries were identified by the UN, on the basis of a number of economic and social indicators, as the 'least-developed' in the world. Nepal was one of them, ranking somewhere within the bottom five (see Table 2.I). Most of these countries suffered, as does Nepal, from geographical isolation, poor internal communications and difficult terrain - desert or mountain, or both. Sixteen of the twenty-five, Nepal included, were land-locked. These in particular were generally dependent to an exceptional degree on relatively more industrialised neighbours for the transport of goods to and from the rest of the world, and traded heavily with those

TABLE 2.1: Economic and Demographic Characteristics of Least-developed Countries

Countries	Population (million) 1969	CDF Criteria			Annual Rate of Growth of GDP 1960-1968 %	Annual Rate of Growth of Food Prod. Per Capita 1961-1969 %	Annual Growth Rate of Exports (%) 1960-1968	Annual Exports Per Capita \$ 1968	Share of Agriculture in Total Labour Force %
		Gross Dom. Prod. Per Capita \$ 1968	Manufacturing Share in Total Prod. % 1968	Literate Adults as % of Adult Pop. 1968					
Afghanistan*	16.5	91	11	8	1.9	0	3.8	4	80
Bhutan*	0.8	n.a.	n.a.	n.a.	1.9	n.a.	n.a.	n.a.	n.a.
Botswana*	0.6	106	8	20	3.7	n.a.	n.a.	27	91
Burundi*	3.5	53	4	10	2.4	1.2	10.7	5	95
Chad*	3.6	73	4	7	-0.1	-6.6	6.6	11	90
Dahomey	2.6	91	5	10	2.9, 4.0	0	6.8	16	84
Ethiopia	24.8	64	9	5	4.6	0	5.1	7	88
Guinea	3.8	89	6	5	5.4	-0.3	0.0	15	80
Haiti	4.8	83	12	11	1.5	-5.3	0.5	11	79
Laos*	2.9	72	n.a.	15	2.6	2.3	n.a.	0.5	81
Lesotho*	0.9	87	1	40	4.2	-11.2	n.a.	18	85
Malawi*	4.4	69	8	15	3.8	5.1	9.8	16	81
Maldives	0.1	n.a.	n.a.	n.a.	2.9		n.a.	n.a.	n.a.
Mali*	4.9	92	8	2	3.4	-0.9	3.6	5	81
Nepal*	10.8	82	11	9	2.8	0	n.a.	n.a.	94
Niger*	3.9	89	6	1	-2.1	0.5	9.1	14	97
Rwanda*	3.5	43	n.a.	10	4.6	2.7	18.4	4	95
Sikkim*	0.2	n.a.	n.a.	n.a.	1.7		n.a.	n.a.	n.a.
Somalia	2.7	60	n.a.	5	4.2	1.1	2.4	10	89
Sudan	15.3	115	7	12	3.7	-1.0	3.4	19	78
Tanzania	12.9	71	6	17	3.9	0	4.8	23	95
Uganda*	9.5	95	8	25	4.0	0.7	7.1	29	89
Upper Volta*	5.3	51	6	7	2.3	-0.9	20.3	4	86
Western Samoa	0.1	n.a.	n.a.	n.a.	n.a.	n.a.	-4.1	n.a.	74
Yemen (Arab Rep.)	5.6	110	n.a.	10	4.8	0.8	n.a.	2	90

*Land-locked

n.a. = not available

neighbours from a position of weakness, for geographical, economic and political reasons, as in the case of Nepal with respect to India.

Many of these countries were characterised, furthermore, not only by their extreme poverty, general lack of development and dependence on large and relatively powerful neighbours, but also by considerable internal inequalities in the spatial and inter-household distribution of income. They also demonstrated remarkably low levels of productive investment and a progressive deterioration of their general economic base, usually reflected directly in declining per capita income, despite financial 'support' from outside the country and excessively heavy use of crucial but extremely limited physical resources within the country.

One authority on Nepal has written, of the period 1956-1965: "the limited available economic data suggest that overall national output during this period grew at the average rate of about 2% per annum, while population growth tallied about 2.5 per year" (Beenhakker, 1973: 3), and as recently as 1974 a UN report opened with the bleak statement: "Nepal is poor and is daily becoming poorer" (ARTEP, 1974). Figures for the period 1961-1969, relating to the annual rate of growth in per capita food production - a crucial indicator in a country where nearly 95% of the population are dependent on agriculture - suggest that, at best, Nepal attained a zero rate of growth during that decade (Beenhakker, 1973: 38; OECD, 1972: 105). Whatever statistics one takes - and there is often considerable variation owing to the fundamental unreliability of much of the data on which the statistics are based - there appears to be good evidence to suggest that Nepal's predominantly agrarian economy is having great difficulty even in keeping pace with population growth (see Table 2.II).

TABLE 2.II: Extrapolation of Past Trends up to 1990 in respect of some Indicators

	<u>1970</u>	<u>1980</u>	<u>1990</u>
Population growth-rate (% per annum)		2.3	2.3
GDP growth-rate (% per annum)		2.2	2.2
GDP per capita growth-rate		-0.1	-0.1
Total cereal production ('000 mt)	3,793	4,190	4,628
Total cereal domestic demand ('000 mt)	3,427	4,283	5,415
Cereal balance - Surplus (+) ('000 mt)			
Deficit (-) ('000 mt)	+366	-93	-787
Per capita supply (kg per capita)	355	296	258

Source: FAO, Perspective study of agricultural development for Nepal, 1974: 8

Thus, Nepal today is a country in crisis; a crisis brought about by rapid population growth and the inability of either the State or private enterprise to respond adequately to increase production and generate accumulation for further productive investment. Reasons for this general inability to respond adequately, even when foreign aid in the form of loans or infra-structural development such as the construction of roads is provided by numerous donor countries, are suggested below. It is necessary, however, to provide a brief introduction to the dimensions of the crisis and the major factors involved.

The present rate of population growth threatens to bring about the collapse of the hill economy (where 59% of the total population live) within fifteen years, through land fragmentation, declining yields, forest degradation, erosion and subsequent loss of arable land. Already the hills as a whole are a food-grain deficit area and largely dependent on foodstuffs bought with cash derived from remittances sent back by those employed abroad. The failure of agriculture in the hills to develop beyond various forms of domestic production and (to a very small extent in terms of total output) petty commodity production is related both to this intense pressure on existing resources and to the export of labour from the hills and out of Nepal, which maintains marginal farms in the hills.

The plains of Nepal, called the terai (a narrow strip between the foot of the hills and the Indian frontier approximately 15-30 kms. wide along the entire width of the country), is still a food-grain surplus area, but will be increasingly subject to pressure of population as immigration from the hills and India - already taking place on a considerable scale both legally and illegally - increases. It has been argued by some that population pressure can act as a stimulus to technical innovation and development in agriculture, but even in

the terai, where resource, transport and labour conditions are more favourable, the extent to which 'modern' capitalist agriculture has developed remains limited.

In 'industry' only a handful of establishments, mostly in the eastern terai and Kathmandu, are involved in large-scale mass production. One major reason for the failure of Nepal to develop industrial production beyond this level is the existence in India of relatively developed large-scale industry which is able to produce virtually all of the major commodities required by the Nepalese market at competitive prices. This has prevented the emergence of indigenous industry at anything other than a simple level, and even brought about the decline of what small-scale local industry existed before.

2. The Nepalese political structure

The fundamental continuity in the structure and organisation of the Nepalese State over the last two hundred years explains in large part its inability to intervene effectively in the production process and its heavy reliance today on foreign aid. Since the unification of Nepal by Prithvi Narayan Shah in the second half of the eighteenth century, the State has sought to extract taxes from immovable assets (usually land) and transactions (especially the Nepal/India and Nepal/Tibet trade). In the context of what can be labelled a 'tributary' state, settlement of land was actively encouraged so that the tax base could grow. Indians were invited to settle in the terai as farmers and traders, and on several occasions central directives were sent to local rulers, petty chiefs and officials warning that current oppressive behaviour would result in the taxed merely fleeing from the area, a loss of tax revenues and the wrath of Kathmandu.

This system of extraction of taxes for the ultimate benefit of a small ruling group (the Ranas, a lineage of hereditary prime ministers who with their relatives ruled Nepal from 1846 to 1951) was secured by agreements between Nepal and British India. While Britain guaranteed the external security of Nepal, the Ranas allowed the British to recruit soldiers and engage in trade. In some respects, then, Nepal had a status viz-a-viz the British Raj similar to that of the larger princely states such as Rajputana or Mysore.

By the time the British withdrew from India in 1947, most of the major characteristics of the present Nepalese state had been established: a government intent upon extraction of taxes for consumption by a few; a population which was exceeding the levels which the land could feed under existing technologies; a labour exporting economy to support this population; and a stunted industrial and manufacturing sector due to unsuccessful competition with Indian-made goods. However, independent India followed a different policy regarding Nepal compared with the British. With active encouragement from India, the Ranas were overthrown in 1951 and the monarchy restored, with the expectation of the establishment of a parliamentary democracy along the lines of the Indian model. However, rule by the Nepali Congress Party was short-lived and within a decade the Crown was able to take control of the State apparatus without any fundamental change in the membership of the ruling group. In the early 1960s the Panchayat System of representation was introduced, but, despite the rhetoric of democracy, the degree of popular participation remained limited, and local independence in decision-making very small. Political parties have been banned since 1961. Another type of rhetoric has begun to appear in the seventies - the rhetoric of development.

However, the provision of services such as agricultural extension, technical education and health is at a low level even in comparison with other poor countries. Notwithstanding the ineffectiveness of many State development institutions and the low degree of regional devolution of decision-making, the last decade has seen an enormous expansion in the number of government offices outside Kathmandu valley which have had an important local economic impact directly through increased demand for the products of construction, furniture-making, printing, etc., and indirectly through imports for consumption demanded by the employees. The causes of this enormous expansion of the bureaucracy are intimately associated with the expansion of academic education but are also related to the provision of aid and the desire to secure future aid by providing the appearance of a strong implementing organization, although unfortunately not the substance.

3. Population pressure in the Hills

Although it is virtually impossible to establish rates of population increase from before 1961 with any degree of accuracy, there is evidence that the present 'problem' started to be apparent in some areas between the World Wars. This problem is that the balance between forest and arable land has been irrevocably disturbed. Arable land requires a net transfer of fertility from the forest by the transport of leaves and grass either to the field directly or more usually as fodder to stall-fed animals, from whence it is distributed as farmyard manure to the fields. If this transfer does not occur in sufficient quantity to maintain nutrient levels and structure in the soil, a decline in fertility will occur. The response

to such a decline, even with a constant population, is to clear more forest for arable land to maintain levels of total yields, and with a population increasing about 2.4% per annum, the emergence of a very serious ecological problem must occur. The stripping of the forest cover exacerbates the situation, in that resulting soil erosion further reduces the ability of the land to support an increasing population, and, additionally, perennial water supplies are adversely affected, reducing the amount of irrigable land.

Evidence from similar situations of ecological decline in mountainous country elsewhere (e.g. Lesotho, Southern Italy, Morocco) point to the probability that this process in Nepal was rapid and recent. If this is so generally in Nepal (even with regional variations in the timing of onset), it is easier to comprehend why hill agriculture has not been able to respond adequately. Within living memory pastoralism, slash and burn techniques on the hill slopes with single-crop rice cultivation in the valleys and the terai (limited until recently by malaria infestation, such that where possible farmers returned to higher ground at night) were practised. The remnants of the pastoral economy can be recognised in the very high population of cattle and buffalo per capita which still remains, but flocks of sheep and goats have been considerably reduced due to the inability of lands close to the village to support them in winter between their annual summer migrations to the high hill pastures.

Hence a very profound change of a systemic nature has been forced upon the agriculture in the hills. New responses in terms of intercropping, the introduction of wheat into rice lands in winter and minor improvements of irrigation and field levelling have taken place, but have not kept pace with population growth.

4. Aspects of international relations

After independence India was able to maintain close ties with Nepal. Although Indian defence personnel were ordered to leave Nepal by King Mahendra in the 1960s, India took over the major part of the recruitment of Nepalese as soldiers. A series of trade and transit treaties, in which Nepal was in an inferior tactical position, ensured the increased flow of Indian goods into Nepal and the continued pre-emption of the development of Nepalese industry. Furthermore, the construction of roads between the two countries (north-south alignments) has been largely financed by India and serves both commercial and strategic interests at one and the same time. For the Nepalese, however, the recent annexation of Sikkim by India gives grounds for considerable concern and friction. Nevertheless, India is heavily involved, both as an aid donor and as an employer of Nepalese labour in industry, the army and elsewhere, in supporting the Nepalese economy. However, while this temporary absorption of surplus population in various forms of wage labour staves off the crisis for Nepal as a whole, it could be argued that it also tends to inhibit the development of more intensive and efficient forms of production in Nepalese agriculture and industry.

From the point of view of certain industrialists and businessmen in India, Nepal constitutes a peripheral but important market for commodities produced on a mass scale in India, and this produces considerable pressure on the Indian government to ensure that political boundaries do not provide real tariff barriers to the export of Indian manufactures. In so far as it represents such interests, the Indian government is concerned to maintain and even extend such trade and transit treaties as exist, all of which favour Indian producers and merchants at Nepal's expense and contribute very largely to the stunted

development of Nepalese industry. The predominance of Indian production, whether in industry or in agriculture, is evidenced in the fact that even in the remotest Nepalese villages mass-manufactured commodities have largely replaced locally-produced goods, while even in hill towns, where they are connected to the Nepalese and Indian terai by roads, vegetables such as potatoes and onions for sale originate usually in the Indian, rather than in the surrounding hill economy.

5. The political economy and transportation in Nepal

In common with other states, such as Ethiopia and Iran, who maintained nominal political independence during the nineteenth and first half of the twentieth centuries, the Nepalese ruling class regarded improvements in transport facilities as a threat to their remaining autonomy. Offers of British help to link Kathmandu with India by road were refused and, in general, restrictions on movements and activities by non-Nepalese created the image of a 'closed' country despite the accelerating integration of the Nepalese economy into the Indian. The ability to enforce a *corvée* system for obtaining labour suggests that the construction of a national communications system using domestic resources could have been undertaken. The will to undertake such a task failed to emerge due to the belief in external threat, the weakness of an administrative structure based on rapid circulation of senior officials (to avoid internal threats) to undertake long-term projects, and, paradoxically, just that very ease in commandeering forced labour to carry goods thus making transportation for the ruling class privately cheap over even the most ill-served terrain.

The neglect of the internal communications system contributed to the ease with which the political changes in 1951 were accomplished. Once the tacit support of the British for the Rana regime was replaced by the less sympathetic attitude of the new Indian republic, it was simple largely to immobilise the regime's military response by refusing transit through India. This experience has undoubtedly contributed to the willingness of successive Nepalese governments to accept, and indeed encourage, offers of foreign assistance to construct a highway network reducing the dependence of Nepal on the Indian transportation system. However, as we shall see below, the reduction of this dependence (and restrictions on Indian military personnel) has facilitated the growth of dependence based on trade and aid. Road construction programmes have dominated Nepalese planning involving Indian, Chinese, Russian, American and British engineers with associated evaluation and complementary input exercises provided by UNDP, German and British agencies among others. The programmes were justified on the basis that the, admittedly dramatic, reduction in transit times would be reflected in lower prices and the emergence of appropriate specialisation within a framework of comparative advantage. Additional arguments, which were crucial in persuading the UNDP evaluation team to accept Nepalese government recommendations on where roads should be constructed, included 'nation-building' and strengthening of 'growth-axes' (i.e. links between major administrative centres in designated planning regions).

The role of foreign agencies in constructing roads not only reflects the Nepalese inheritance of very few trained engineers but also the failure of local initiative to mobilise labour effectively. Even where considerable efforts were made to involve Nepalese nationals as contractors there is evidence that commitment remained relatively

low and labour was sought in India rather than locally. This tendency, plus the distribution mechanisms within the Nepalese political economy, ensures that heavy expenditure on labour does not generate increased economic activity in the area through which the road passes but is directed spatially and socially away from those most in need because those most able to accumulate from road construction tend to put the surplus to non-productive uses such as merchanting and investment in real estate. Those benefits which are most likely to accrue to the poorest (landless labourers and sub-marginal farmers) in the form of wages paid for road maintenance after construction is completed, are also severely reduced because insufficient is being spent to maintain the roads adequately. Furthermore this is exacerbated by failure to pay wages promptly to labourers in maintenance gangs due to the unavailability of central funds. This has a special irony since the central authorities exact tolls on traffic (as well as high taxes on purchasing vehicles, fuel oil, spare parts and considerable licence fees) which appear economically unjustifiable in a country where traffic densities are extremely low. The historical experience of Nepal suggests that in conception, realisation and reproduction the provision of motorable roads in Nepal cannot be totally explained within the framework of conventional social benefit-cost analysis and suggests the need for an approach which recognises the peculiar features of Nepalese society within the context of a process of continuing underdevelopment by no means peculiar to Nepal.

6. Conclusions

It will be clear that in situations where high movement costs are not the only major constraint to development, i.e. current user-cost savings are high, and where decisions concerning both the construction and utilisation of transport systems are based on a whole variety of motivations, an analysis of the impact of a transport project must be based within the socio-economic structure in which it is situated. As will become apparent in the next chapter, Nepal faces a crisis which deepens yearly and its government is largely unable to implement changes which will avert or even substantially postpone it. In this situation we are obliged to ask not only whether roads provide a necessary though not sufficient condition for development, but whether their provision implies such high opportunity costs that roads provision should not be considered at all as against other investments.

In order to appreciate the significance of changes in the structure and organisation of transport for the future of Nepal it is necessary to investigate the determinants as well as the 'effects' of those changes, and thus to situate the evaluation of changes in modes of transport - their causes and effects - firmly within the context of the political economy of Nepal as a whole. In this case the structure and organisation of transport, as well as the effect of changes in modes of transport, must be regarded as an integral part of the political economy. As the relationship over time between different sectional and class interests constitutes the foundation of a political economy the analysis of the political economy and hence transport organisation will be based on a class analysis with its implied historical dimension.

Therefore, an explanation of both the provision and use of roads themselves requires analysis of structures at the national and international level as well as at the local level. It is inevitable that, when road provision is seen to be unable to alleviate the crisis in Nepal to any substantial degree, the analysis then focuses on why this is so, and attempts to explain why roads have not in Nepal produced effects of the kind which have been recorded elsewhere or which might seem reasonable a priori without a deeper understanding of the particular economy and society concerned. Such an approach is not based on radically new premises, but we attempt here to explore further the implications of such an approach, and to provide a theoretical framework as well as a methodology which will be applicable in other countries, as well as elsewhere in Nepal.

CHAPTER THREE: RURAL ECONOMY AND SOCIETY

1. Introduction to crisis

In Nepal 94% of the economically active population are employed in agricultural production, and 97% are classified as rural. Furthermore, agriculture provides for more than two thirds of Gross Domestic Product and over 80% of export earnings. Table 3.I indicates the levels of productivity in Nepal and the west-central region. Although these statistics must be treated with caution, the extremely low level of production per head (particularly within the hills) is clear. Moreover, the trends of overall production for different crops (food grains in Table 3.II and cash crops in Table 3.III) are equally dismal. The current scale of deficit or surplus of agricultural production, although liable to considerable uncertainty due to the difficulties of collecting reliable data, show a definite deteriorating trend through time. Here we use official statistics (which are confirmed in general trends by our traffic surveys which measure spatial movements of food, as well as our rural surveys which measure production, consumption and sales at the point of production). By simple methods of computation and assumptions concerning yields, loss from wastage and milling proportion required for seed, and nutritional requirements, it is possible to make approximate estimates of food deficits and surpluses for 1971 (Table 3.IV).

It can be seen that the hills are seriously deficit in grain. Furthermore, the surplus in the terai does not necessarily move to the deficit areas in the hills, but to India because of a tendency towards higher prices there and the relative ease of crossing the

TABLE 3.I: Indicators of productivity and income, 1970/71

	Agricult. GDP 70/71 (000 Rs.)	% GDP contri- buted by agric.	Per capita GDP (Rs.)	Agricult. GDP per econ.ac- tive pop. in ag.(Rs.)	Per capita GDP (\$)	Agricult. GDP per econ.ac- tive pop. in ag.
<u>West Central Region</u>						
Mountain	39,626	86.98	852	1,227	81.14	164.48
Hill	574,336	82.33	384	662	36.97	63.05
Terai	472,862	67.92	1,177	2,140	112.10	203.81
TOTAL	1,086,824	75.29	586	978	55.81	93.13
<u>Nepal</u>						
Mountain	460,255	85.20	426	735	40.97	70.00
Hill	2,169,111	67.77	539	867	51.33	82.00
Terai	3,410,634	63.91	1,288	2,380	116.95	226.67
TOTAL	6,040,000	66.54	785	1,319	74.76	125.62

Source: Central Bureau of Statistics

TABLE 3.II: Main trends in food grain production, Nepal

Grains	Annual Growth Rates 1967-1972 %		
	Area	Production	Yield
Paddy	0.9	0.6	-0.3
Maize	0.1	-0.9	-1.0
Wheat	10.6	7.4	-3.1
Minor grains	2.7	1.8	-0.9
TOTAL	1.7	0.7	-1.0

TABLE 3.III: Main trends in cash crop production, Nepal

Crop	Annual Growth Rates 1967-1972 %		
	Area	Production	Yield
Oilseed	2.7	1.1	-1.6
Jute	9.0	6.5	-1.5
Potato	3.0	0.9	-1.2
Sugar cane	6.4	7.4	1.0
Tobacco	2.4	N.a.	N.a.

Source: EAPD Agricultural Statistics of Nepal and FAMSU MPAI

**TABLE 3.IV: 1971 Edible grain availability requirements
and net surplus/deficit (tons)**

	Mountains	Hills	Terai	Region	Nepal
Edible grain available	11,533	219,960	196,096	427,589	2,029,588
Edible grain required	7,974	290,656	113,075	411,705	1,966,667
Surplus/ deficit	3,559	-70,697	+83,021	+15,884	+66,921

border, whether legally or illegally, by means of Customs Posts and the main road or 'unofficial' points of exit and small tracks. A simple projection of future grain production and requirements (explained in Vol.II 1), which assumes a projection of declines in yields based upon data from 1964-74 and the expansion of cultivated area based on the same time period, shows that overall surplus/deficit of grain in metric tonnes was +15,884 in 1971, -13,188 for 1976, and -38,825 for 1981 in the region. This overall position derives from a slowly declining net surplus from the terai, and a rapidly increasing deficit in the hills (+70,697, -96,683, -123,755 for 1971, 1976 and 1981 respectively). When the 'safety valve' for population pressure in the hills no longer operates (because the remaining forests in the terai will have been cleared and settled), 1) the grain surplus from the terai will rapidly decline due to a sharply accelerated process of diminution of holdings, and 2) population pressure will build up in the hills even more rapidly. It is very difficult to assess when this threshold will be reached, but it is calculated that, at current mean holding size, the unsettled area of

the tarai in the west-central region will accommodate only three years' population growth of the region. This growth is accelerated by illegal settlement by Indian nationals. Already regional manifestations of the crisis are apparent. Local famines are more frequent, landfalls larger and widespread (and large enough to cause serious loss of life as well as of arable land), and vulnerable groups in the population, such as rural craftsmen, further threatened. Palliatives in the form of foreign aid (such as the airlift operated by the British in 1971 dropping grain by parachute to hard-pressed hill areas, and longer-term consignments of American P1480 maize) and scanty government famine relief measures do not tackle the crisis at root.

One of the central dynamics in this gloomy prognosis is the relationship between population growth and ecological decline. In order to maintain fertility of arable land there has to occur a sufficient transfer of nutrients from non-arable (usually forest) areas. Even with a static population, insufficient transfer of fertility (involving removal of forest litter and leaves from living trees for fodder which is then converted to farmyard manure which is applied to the fields together with the bedding for the stock - usually straw or dried leaves, pine needles, etc.) leads to declining yields. This in turn requires an extension of arable land to maintain required aggregate levels of production, which leads to a further disturbance in the forest-arable ratio. Failure to maintain adequate levels of nutrients from natural sources in the soil derives in the first place from the increasing distances which household labour is obliged to go in order to feed their stock (return journeys in many panchayats today frequently are as long as eight hours). If population increase is now added to this scenario, it is clear that a vicious circle is firmly

established which leads to accelerated erosion and a deteriorating ecological balance. Two past growth rates can be stated here which summarise the predicament of the rural population of Nepal. First, the average decline p.a. in yields per unit area of food grains between 1964 and 1974 was: paddy 0.7%, maize 0.8%, wheat 0.7%, millet 0.47% and barley 1.92%. Secondly, it is variously estimated that population growth in the same period was between 2.1 and 2.5% per annum.

2. Roads as part of resolution of crisis?

It will be clear to the reader that a major transformation of the productive forces in agriculture is urgently required if Nepal is to avoid endemic famine on a major scale and mass distress migration. It is doubtful whether truly self-contained subsistence agriculture can be maintained in the hills for very much longer, although effective palliative measures no doubt might postpone the worst effects of a rising population, a sluggish pace of agricultural technical innovation and ecological decline. One major policy direction is to encourage strongly the commercialisation of agriculture, so that regional comparative advantages may be realised by increases in product specialisation. Commercialisation on this scale would in turn require large increases in the distribution of new inputs and the knowledge of how to use them. The provision of roads is instrumental to this end if it makes inputs more widely available to a high proportion of farmers for whom chemical fertiliser use (as an example of one transport-intensive input) is demonstrably profitable. The cost of chemical fertiliser was calculated to increase approximately 30% for each day's transport from a road on the back of

a porter. The effectiveness of this reduction in the transport cost of this (and other) inputs, however, may be pre-empted by the recent secular rise of the cost of oil-based inputs (or those manufactured only with relatively high energy costs). The provision of roads in this context can be seen as providing the by now familiar 'necessary but not sufficient condition'. Although fertiliser-response data is very sketchy in Nepal, the recent rise in fertiliser costs (to a level about five times the 1971/72 level) has reduced revenue cost ratios to below unity in most of our sample locations for paddy and wheat. The basis of this analysis (see Vol.II, 5.78) is also optimistic in that the cost of providing complementary inputs needed to make fertilisers reach their full potential has been disregarded. Thus the role of roads in facilitating the distribution of fertilisers is in turn dependant upon a set of wider issues such as the pricing policies of OPEC countries (quite outside Nepal's control); Nepal's relations with India (largely determined by India's dominant position); Nepal's ability to manufacture her own supplies (possibly using cheap hydroelectric power to produce enough nitrogenous fertiliser to trade for the other two essential elements); and the effective organisation of a distribution service for the inputs themselves as well as effective extension in the context of rain-fed, terraced, small-farm agriculture.

Improved transportation facilitates the commercialisation of agriculture in that it encourages specialisation, providing farmers' food supplies can be reliably and cheaply provided through an efficiently functioning market. This impact increases if such provision stimulates demand for goods, the price of which had a high transport component prior to road construction. Marketing co-operatives may also develop to eliminate monopsonistic tendencies in remote areas

with low producer densities, and ensure that a higher proportion of the retail price finds its way back to the producer. In the west-central region such facilitation is hypothetical rather than actual since the production situation which determines on-farm decisions and the merchandising of produce militates against an efficient market while interests represented at the District level tend to impede what initiatives are taken in Kathmandu for revitalising the agricultural sector.

It is for reasons such as these (which are outlined in Chapter 1 with regard to transport investment in general, in the Nepalese political economy in Chapter 2, and will be documented in more detail in this chapter for the rural areas and in Chapter 4 for the urban areas) that this report is not principally concerned with conventional technical issues concerning the optimum density and quality of the road network to satisfy some aggregate production objective, subject to some construction cost constraints, or response in consumption to price changes brought about by road provision. It is certainly not that we consider these exercises per se irrelevant or useless, but that, in circumstances where policy recommendations which might issue from such calculations have little chance of implementation, it is not practical to indulge in modelling desirable ends without specifying the dynamics or means by which such ends are reached. This report seeks to explain within the broader framework of the political economy as a whole why roads have had such a disappointing effect just where positive and beneficial effects are needed most. It is as well to make quite clear that our conclusions are not that roads should not be built, or that they should be condemned because they have done little good to the people of west-central Nepal and arguably some harm, but that the impact of roads is a function of the form of political economy, in this case that of Nepal, but

demonstrably also in the case of other countries in similar situations, such as Ethiopia, Afghanistan, Thailand, Lesotho and in remoter regions in Latin America.

The next section attempts to place the impact of roads provision within the specific situation studied and thus moves away from the emphasis on hypothetical comparative advantage examined in this section.

3. The impact of roads on rural economy and society of west-central Nepal

What have the results upon producers in the countryside been in west-central Nepal? First of all, their characteristics must briefly be enumerated:-

- (a) A large and impoverished peasantry, increasingly undermined by population pressure. The more fortunate have remittances from continuing employment in foreign armies and from migratory labour in India (itself a response to the fragility of the economic base at home). Reduction in productive capacity of privately held land (through population increase, declining yields and sometimes soil erosion) has led to an inability to feed the household from its own land and to afford the goods which have to be purchased, thus encouraging unequal relationships with traders and moneylenders.
- (b) A very much smaller class of 'semi-feudal' landlords which survives the imperfectly constructed and implemented Land Reform Programme. Petty chiefs and local lords were traditionally given various land grants and rights over huge areas, and they (or their direct descendants) still maintain large

estates with increasing demands for imported commodities and access to urban facilities.

- (c) A very few producers have responded to the opportunities afforded by the new technology. These are overwhelmingly located in the terai which is better suited to its application and already have cheap physical access to India, their major market for inputs, outputs and casual labour.

There can be identified three forms of production with associated and differentiated transportation requirements, all of which derive from the historical development of the Nepalese social formation. These forms of production are analytical categories, and do not necessarily form statistically significant classifications. The status and purpose of these categories do not rest upon the empirical division of households, but are to clarify the underlying contradictions determining the historical process (in which roads play a certain part): "the capitalist does not appear suddenly out of the blue as a clearly defined 'pure' socio-economic type; he develops within the pre-existing non-capitalist economic structure" (Patrik, 1971). We observe empirically households to be in transition, which do not exhibit all the characteristics of any pure form. Table 3.5 summarises the characteristics of the three forms of production. Table 3.6 gives an indication of the numbers of households in each cell of a matrix the vectors of which represent volume of farm sales and employment status plus the existence of non-agricultural income. It can be expected that the domestic or peasant form of production will predominantly be associated with households in columns 3-6 (the most advantaged being column 5, particularly cells 5D, 5E and 5F), while semi-feudal and capitalist production households are in columns 7-10. Table 3.5 uses analytical categories to

TABLE 3.4: Characteristics of forms of production

Characteristic Forms of Production	Relations of Production	Relations to Market	Use of Surplus
Peasant or Domestic	Predominantly within household and between kin. Reciprocal exchange of labour between households of broadly comparable economic standing	Recognised non-market patron-client relations with occupational castes (blacksmith, tailor, etc.). Consumption requirements of items which cannot be produced in the household purchased by small cash sales of surpluses to achieve consumption targets	Surplus re-distribution (gifts, unrecalled loans). Frequently households budgets balanced therefore no regularly produced surpluses and no continuous accumulation
'Semi-feudal'	Particularistic. Tendency to have more 'permanent' labour than casual or wage labour. Tenants and sharecroppers	Sale of produce low per unit of production because of characteristic use of surplus. Consumption standards for owner of means of production often require considerable purchases of status conferring goods	Large surpluses of some households are distributed to kin, household servants and sometimes village. Conspicuous consumption.
Capitalist	Casual labour for wages (payment for work done), or substitution with machinery under control of owner	Sale of produce to anonymous market. Production for exchange dissociated from consumption demands	Re-investment in productive capacity

TABLE 3.91: Numbers and percentages of rural survey interviews cross-tabulated by total cash farm sales, relations in employment and existence of non-agriculture income

43.

'Class' position of households	1		2		3		4		5		6		7		8		9		10		Row Total
	Labourers		Labourers + Dom./Peasant Producers		Dom/Peasant Producers		Small Employers/Rich Peasants		Large Employers/Semi-feudals & Capitalists												
	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without	
A Rs.250	1	44	68	24	39	108	12	9	1	6	0	311	46.9%								
	2	14.1	21.9	7.7	12.5	34.7	3.9	2.9	0.3	1.9	0.0										
	3	91.7	75.6	63.2	48.1	56.5	11.7	23.1	2.6	33.3	0.0										
	4	6.6	10.2	3.6	5.8	16.2	1.8	1.3	0.1	0.9	0.0										
B Rs.250-499	1	2	5	9	15	26	10	3	1	0	0	71	10.6%								
	2	2.8	7.0	12.7	21.1	36.6	14.1	4.2	1.4	0.0	0.0										
	3	4.2	5.6	23.7	18.5	13.6	9.7	7.7	2.6	0.0	0.0										
	4	0.3	0.7	1.3	2.2	3.9	1.5	0.4	0.1	0.0	0.0										
C Rs.500-749	1	0	7	2	8	14	12	3	1	1	0	48	7.2%								
	2	0.0	14.6	4.2	16.7	29.2	25.0	6.3	2.4	2.1	0.0										
	3	0.0	7.8	5.3	9.9	7.3	11.7	7.7	2.6	5.6	0.0										
	4	0.0	1.0	0.3	1.2	2.1	1.8	0.4	0.1	0.1	0.0										
D Rs.750-999	1	0	4	0	7	16	21	4	4	0	0	56	8.4%								
	2	0.0	7.1	0.0	12.5	28.6	37.5	7.1	7.1	0.0	0.0										
	3	0.0	4.4	0.0	8.6	8.4	20.4	10.3	10.5	0.0	0.0										
	4	0.0	0.6	1.0	1.0	2.4	3.1	0.6	0.0	0.0	0.0										
E Rs.1000-1999	1	2	5	3	7	19	29	7	7	3	1	83	12.4%								
	2	2.4	6.0	3.6	8.4	22.9	34.9	8.4	8.4	3.6	0.2										
	3	4.2	5.6	7.9	8.8	9.9	28.2	17.9	18.4	16.7	4.8										
	4	0.3	0.7	0.4	1.0	2.8	4.3	1.0	1.0	0.4	0.1										
F Rs.2000-4999	1	0	1	0	5	8	17	9	20	4	9	73	10.9%								
	2	0.0	1.4	0.0	6.8	11.0	23.3	12.3	27.4	5.5	12.2										
	3	0.0	1.1	0.0	6.2	4.2	16.5	23.1	52.4	22.2	42.9										
	4	0.0	8.1	0.0	0.7	1.2	2.5	1.3	3.0	0.6	1.3										
G Rs.above 5000	1	0	0	0	0	0	2	4	4	4	11	25	3.7%								
	2	0.0	0.0	0.0	0.0	0.0	8.0	16.0	16.0	16.0	44.0										
	3	0.0	0.0	0.0	0.0	0.0	1.9	10.3	10.6	22.2	52.4										
	4	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.6	0.6	1.6										
Column total		48	90	38	81	191	103	39	38	18	21	667	100%								
Column percentage		7.2	13.5	5.7	12.1	28.6	15.4	5.8	5.7	2.7	3.3										

Notes on Table 3.VI

- 1 = Number in cell
- 2 = Row percentage
- 3 = Column percentage
- 4 = Total percentage

1. The distinction between 'labourers' and 'labourers + domestic/peasant producers' categories was made where household total cash income from labouring accounted for more than half the cash value (at local market prices) of household total consumed food grains;
2. that between 'labourers + domestic/peasant producers' and 'domestic/peasant production' where earnings from labouring amounted to Rs.2000 or equivalent in kind per year;
3. that between 'non-employers' and 'employers' where cash or kind equivalent spent on hiring labour of any sort was less or more than Rs.200 respectively (Rs.200 \approx 6 man-weeks);
4. that between 'small' and 'large' employers where an employer spent less or more than Rs.1000 respectively on any type of labour (one permanent labourer costs about Rs.1000 per year);
5. that between "with" and "without" non-agricultural income where such income exceeds Rs.250 per year.

Source: Rural Survey, 1975.

explain the dynamic of the society through the process of production, while Table 3.6 is an empirically derived classification with arbitrary cut-off points which shows the distribution of households according to two important categories of income (volume of sales and existence of non-agricultural income). In passing, it is worth noting from Table 3.6 that almost half of the households sell less than Rs.250 of agricultural produce per year. This is about Rs.46 per capita (or about £2), while 72% sell less than Rs. 1000 worth of produce a year.

(1) Domestic or peasant production

This form of production essentially involves production for the household's consumption using only its own labour, or that from reciprocal labour arrangements (called paraa). Some degree of redistribution between more advantaged households and both landless labourers and other poorer households occurs in the form of contributions to feasts, life-cycle ceremonies and in unrecalled loans (i.e. quasi-gifts). Household members manufacture most of the goods for the household through cloth-weaving, house-building and the manufacture of rice-stalk mats, bamboo baskets, winnowing fans, etc., which usually takes place in the slack agricultural season or during the evening. Other more specialist tasks of manufacture and repair, such as metalwork for agricultural implements and cooking utensils, shoemaking and tailoring, are carried out by members of occupational castes (usually the poorest village members) who are paid a fixed amount of grain, supplemented by meals and drink whilst working and at festivals, according to only an approximate relative estimate of likely demands by the household. A rate is fixed "by custom" and is sometimes enforced by the pradhan panch (head of the

village panchayat); this varies according to place and occupation - sometimes per capita, per ox owned or per area of land, or a less exact method of computation only generally related to likely demand. Thus the household pays a fixed amount (partially related to ability to pay) irrespective of any annual variations of demand. This system is called bista in the hills, juga in the terai and is parallel to the jajmani system of India in certain respects.

During the course of the last hundred years (particularly in the last thirty) peasant production has changed in a variety of ways in response to population pressure, and to relatively rewarding employment elsewhere. In summary these were:-

- (a) extension of arable land (up hillsides and into the forest in the terai through illegal felling and settlement) and an increase in the proportion of land under food grains;
- (b) intensification of the use of arable land through the upgrading of dry land (pakho) into irrigable land (khet), the introduction of wheat as a winter crop and catch crops and inter-crops, particularly pulses;
- (c) an increase in the exploitation of "communal" resources (forest and pasture) to avoid pressure on privately-owned land, often with the intention of producing a saleable commodity such as ghee;
- (d) a search for supplementary income to support the failing domestic economy, in foreign armies, as wage-labourers in Indian industry, or, in the case of the higher-caste Barhatiya, in the Nepalese bureaucracy;
- (e) a decline in the patronage of the bista or juga, and a corresponding ability to economise by paying cash only for work done.

The extent to which road provision has facilitated these changes is discussed below.

The construction of both the Mahendra Rajmarga in the terai and the Prithivi Rajmarga in the lower valleys of the hills has been associated with very considerable settlement in hitherto malaria-infested areas. In the former case malaria had been eradicated some years before construction started, and there was undoubtedly some settlement by families from the hills as well as 'Indians' (with or without Nepalese citizenship which entitles one to the ownership of land). As soon as the alignment of the road was known, land values rose to many times their former level for roadside locations, and to at least double for plots set a hundred metres or more back from the road alignment. A wide variety of immigrants started to arrive, although the means by which each attempted to establish rights over the land depended upon their access to the bureaucracy, particularly those sections dealing with land registration. The disadvantaged peasants both from the hills and from India tended to squat illegally, eke out a living by labouring on the large estates of semi-feudal landlords, fell or burn part of the forest and plant maize or millet in the ashes. The government's policy is to preserve the forest and so obtain the benefit of timber reserves (enforced by forestry officials who will retain a large share of this benefit, as well as law enforcement personnel), and so squatters are constantly harassed and crops are burnt (or possibly spared on payment of a share of the crop). A number of confrontations have occurred, where the conflict of interests between a hard-pressed peasantry and a government intent on exacting revenues from an irreplaceable natural resource has taken a violent form. The construction of the Mahendra Rajmarga merely accelerated the process of

immigration and conflict of interests between peasant and State. The wealthier and better positioned immigrants tended to buy land outright (often financed by selling land in the hills) or to dispossess those who worked the land by custom. Obligatory land registration carried out during the fifties and early sixties gave the opportunity for the local peasantry to be dispossessed by a variety of ruses, threats and foreclosures of mortgages.

When the Mahendra Rajmarga was being constructed, new economic opportunities arose for illegal squatters (sukumbasi) to tide them over the uncertain and difficult period of establishing their farms in the jungle. Some worked on the road itself, while others set up roadside inns (batthi), distilled liquor, or practised the trade of their occupational caste (leatherworking, blacksmithing or tailoring). Now that construction is complete, this support has disappeared and it has become more difficult to survive until the first harvest. In addition the road has made policing easier.

The situation with regard to the Prithivi Rajmarga is rather different. The alignment of the road was one which tended to minimise construction costs, rather than to maximise its accessibility to the population who live predominantly on the hill-tops and spurs. The malarial valleys along which the road was aligned had first to be cleared of malaria. The example of the village of Majuva Khairani shows the interaction of three variables - the construction of the road, the eradication of malaria and the growth of population. Twenty years ago the valley which is now closely settled and closely cultivated with an expanding local bazaar had no permanent settlement. There was no road. Many of the families now living there lived in and around a village, Satra Sayah Ambu, situated on a plateau eight hundred metres above the valley. The valley itself

was low enough to have endemic malaria which prevented any permanent settlement. The valley land was cultivated by labour from Satra Saya Ambu during the day but at night the labourers would return up the hillside to their own village. The families of the farmers would not go down into the main valley. Cultivation therefore had to depend on the farmers' own labour and hired employees only. The result was a system of cultivation quite different from the current one. In any one year only one third of the cleared land was cultivated. The other two thirds were left fallow and used as cattle pasture. The third would rotate each year. A large number of cattle were maintained in this way, at least three times the numbers there now, and ghee sales were the major source of cash. Because the land was not excessively worked and was heavily manured by the grazing cattle for two years in three, fertility was maintained at a high level. There were only restricted labour supplies available to work the main valley and there were also limited demands as population was much less than at present. The area had not yet attracted a large number of migrants from more densely populated areas of Lamjung and Gorkha. The result was that paddy production was very limited. Maize was the main cereal and there was also extensive cotton growth.

Malaria was eradicated around 1960 and from then on it became possible for people to live permanently in the valley. Many of the families then moved from Satra Saya Ambu, where cultivable land was very limited and less productive, and settled permanently on the lands they owned in the main valley. Settlers were attracted in. The labour supply increased as did the demand for grain. Gradually paddy cultivation extended at the expense of maize. Cotton was declining already because of competition from imported textiles.

The area cultivated was also extended. About twenty per cent of the valley floor had been covered by woodland. This has now all disappeared and the only trees left are cultivated groves of mangoes. Most farmers of the area state that the eradication of malaria was the most important change that had taken place in the area. It both allowed a more intensive cultivation system by allowing permanent settlement on the arable land and encouraged immigration, thus increasing the price of land, all of which in turn made intensive cultivation essential. This was at the expense of animal production and the maintenance of a stable nutritional cycle on the land. The road was completed in 1973 and new inputs such as fertiliser and improved seed had a limited effect upon the predominantly peasant producers since fertiliser required cash for its purchase and wide access to agricultural extension advice. The introduction of expanded cash requirements brings serious contradictions into play (to be discussed below), and it was only the very advantaged peasant and the employers of labour who could avail themselves of these new road-based opportunities. Now about 7.5% of farmers of Majuva Khaireni grow winter wheat (for which chemical fertilisers are required), but both inputs and advice fail to travel for more than an hour from the road and certainly do not affect peasant producers at all on the high lands overlooking the road.

One of the characteristics of the peasant or domestic form of production is its minimal involvement with the market. Table 3.7 shows the tiny proportion of producers who have purchased chemical fertilisers or improved seed (or received advice on how to use them). The detailed budgets of households characterised predominantly by the domestic form (e.g. Table 4.III, p. 4.15 in Vol. II) show that the total cash earned by all members of the household together is

**TABLE 3, VII: Visits by JTA, use of improved seed and
chemical fertiliser - domestic/peasant producers**

Sub Group	% never received JTB visits	Chemical fertiliser (% users)	Improved seed (% users)
<u>Domestic and labouring</u>			
1. Farm sales 250 without other income	87	0	3
2. Farm sales 250 with other income	88	8	13
3. Farm sales 250 without other income	83	5	0
4. Farm sales 250 with other income	93	29	14
<u>Domestic</u>			
5. Farm sales 500 without other income	91	0	0
6. Farm sales 500 with other income	81	11	4
7. Farm sales 500 without other income	85	10	16
8. Farm sales 500 with other income	86	16	9

Source: Rural Survey, 1974/75

seldom more than Rs.1000 for those without agricultural income, and more than Rs.2000 for those with such income. A list of the most widespread commodities produced by this form includes:- ghee, tangerines, sugar-cane, ginger, turmeric, green vegetables, potatoes, chickens, eggs, milk, curd, goats, buffalo, cows, straw mats and food grains (particularly in the terai). The most important are ghee, tangerines, sugar-cane, ginger and food grains, and the effect of roads upon the production of these has, with a few notable exceptions, been slight since the resources allocated to their production are very constrained.

a) Ghee is a form of clarified butter derived predominantly from buffalo milk; ghee production has long been the most important hill export and continues to be so today. When forest cover was dense and prevalent, it was easy for most households to own several buffalo and cows for milk, and the fodder needed was limited since a form of transhumance was practised where households moved to a particular locale with their cattle to cultivate a number of fields and then moved on to other pastures to carry out the same agricultural operations in different fields. The effect of altitude introduced the possibility of staggered agricultural labour demand in time and the use of pastures in space. With population pressure becoming more acute, returns to labour in collecting fodder in some places were reduced to negligible levels. Production statistics are difficult to collect because it is the remainder of a day's ghee production after the household's consumption which is stored and sold, and hence accumulation of ghee for sale represents only a part of total production. However, to give an order of magnitude, it seems that returns to labour for ghee production are often less than Rs.1 per day, possibly less than Rs.0.50. Households which are particularly

vulnerable in terms of their ability to accumulate even small savings also find it impossible to purchase a she-buffalo once their own has died. In fact, since buffalo lactate only one year in two without a managed environment and diet, it is necessary to have two she-buffalo in order to ensure continuous production. The mean number of she-buffalo owned by a sample of thirty ghee producers in Gulmi and Baglung Districts was 2.4 and the mode two.

The construction of the Siddhartha Rajmarga, joining the major producing areas in the hills to the major market (the large wholesalers in Butwal and other terai towns for further bulking up to the cities of northern India) did not affect the price of ghee as sold in the market, but resulted in the savings in transport costs of about Rs.20 for one tin (which at present retails for about Rs. 400) being shared between the merchant and producer. Hence this very small increase in price had little chance of affecting production levels of ghee in view of very tight production constraints, which are yearly deteriorating through the destruction of the forest on which ghee production depends.

b) Tangerine production in the hills was undoubtedly much more important in the study area prior to widespread destruction of the trees by "greening disease" shortly after the opening of the Siddhartha Rajmarga, and during the course of two years one of the most important hill exports was eliminated from some areas: Production today is limited to fourteen village panchayats in Gulmi and north Argha Kanchi Districts and scattered villages in Tanahun District. Interviews carried out in Gulmi District indicate that trees were planted sixty years ago primarily for home consumption, particularly as a gift for guests and for children. Usually a few trees (up to a maximum of about thirty) were planted on terrace backs or occasionally around

the house itself merely to feed the family. In the few cases where large groves of two hundred or more had been planted these were status symbols and a basis for largesse.*

Even today, when most of the crop is sold, vestiges of non-market and re-distributive relations in the picking and transport of the fruit exist. The crop is sometimes sold on the tree to local landless or sub-marginal farmers in Gulmi or to merchants in Tanahun; they then pick the crop and transport it to Patherkot (one and a half days walk away to the south) or to Kathmandu respectively. Generally the local buyer in Gulmi makes a substantial profit margin by selling the tangerines retail in Patherkot bazaar, or by the basket to Indian merchants, who resell them either in bazaars in Nepal nearer the border (Lumbini, Bhairahawa and Taulihawa) or in India itself. About two thirds of the producers porter their own produce to Patherkot (and occasionally Tansen), and return with cash purchases of cloth, salt and grain for consumption by the household.

Producers regard their trees as a 'bonus' and would sell most of their crop even if the price per tangerine dropped to half its present level (which is sixteen to a rupee for large tangerines in the village or four to a rupee at Patherkot) despite the fact that many have very small farms and rely on labouring and tangerines entirely for their cash needs and to buy in grain. Since no JTA had ever visited any of the thirty-five interviewees in Gulmi District, no one had a clear idea of how to increase production per tree. Troublesome root weevils (called locally asaru), hail damage and an ageing population of trees all combined to present a dismal future

*It is not known why the planting of trees was limited to this area since the tree is tolerant of altitudes from 3,000 to 7,500 feet.

for this commodity as a cash crop for the small peasant producer. Hardly any new planting had taken place for the past ten years and yields were reported to be falling in most cases.

Failure of government extension to restore production of a highly suitable commodity for the hill economy is conspicuous. Once again, the absence of effective government intervention means that the role of roads in transporting a highly valuable but perishable crop to established markets is rendered inoperative. The present role of roads in reducing transport costs of tangerines to markets in the terai and India is negligible since production of all citrus fruits is at such a low level that local hill markets account for most of the produce of Tanahun District, and that of Gulmi and Argha Kanchi Districts is portered by trails to Patharkot and Butwal in any case. In fact, the failure of the tangerine production to re-establish itself in the hills (particularly Kaski District) has actually created a market for Indian oranges which now find their way via small streetside Indian traders (travelling by bus and truck) to Pokhara itself, once situated in the middle of the region with the heaviest export surpluses.

c) Sugar-cane production is not wholly in the hands of petty commodity producing peasants, as in the case of ghee, tangerines and ginger, although many peasants who have co-farm advantages as well as comparative locational advantage do grow cane. Commercial growing in the hills has been long established, although quite large increases in the area planted (not matched by increased production due to substantial decline in yields) are reported by official statistics (Vol. II, p. 5.55). Production in the hills is, however, overshadowed by that in the terai, and in west-central Nepal the major concentrations are around Targa in Gulmi District (one day west

of the Siddhartha Rajmarga), around the town of Walling in Syangja District (on the Siddhartha Rajmarga), near Dumre on the Prithivi Rajmarga and in isolated places off roads in Syangja District. Some conflicting evidence concerning the effect of roads upon sugar-cane production in the hills has come to light. In off-road locations the reduction in the cost of refined sugar from the Mahendra Sugar Mill in the terai, together with increasing population pressure and the perception of white sugar as a high status good has tended to reduce areas under sugar-cane. However, in Walling (an on-road location) it is reported that cheap grain can now be imported from the terai by road so that it becomes advantageous to grow sugar-cane to sell locally in the form of khudo (partially reduced cane juice), although the order of magnitude is very small (an increase of 1.1 ha. in 1970 to 6 ha. in 1975). Because of poor historical data it is not clear how far sugar-cane in off-road locations has declined due to locational diseconomies.

In the terai the causes for the growth of cane production can be satisfactorily explained. It is clear from Table 3.8 that the numbers of growers are rising (to over 10,000 in 1975) but the average area planted with cane is falling so that the total area under cane is relatively stable. The fall in plot size represents the growing attractiveness of multi-crop cereal production (paddy plus wheat) compared with sugar-cane production. The rise in absolute numbers of growers reflects both the increased accessibility of the one large sugar mill near Bhairahawa. However, yields are very low indeed even compared with nearby Indian yields where physical conditions are inferior. Very low fertiliser use, high susceptibility of the most widely grown variety to root rot and ratoon stunting disease, and practically no extension advice are contributory causes.

TABLE VIII: Number of growers and plot size - sugar cane producers for the Mahendra Sugar Mill

Year	No. of Growers	Average Plot Size (ha.)	Total Area Under Sugar Cane (ha.)
1968/69	2,500	0.63	1,575
1969/70	2,800	0.59	1,652
1970/71	4,500	0.35	1,575
1971/72	7,000	0.24	1,680

Source: Mahendra Sugar Mill (1975)

The opening of the Mahendra Sugar Mill just outside Bhairahawa eleven years ago diverted existing sugar cane flows from mills in India. The mill has five collection points on or near roads in the terai in Rupandehi and Nawalparasi Districts. The procedure for one such point on the Mahendra Rajmarga is as follows:

The farmer registers with the mill the area of sugar-cane he is growing and is informed by his local collecting station when to deliver in the collecting season (October to April). The permitted period is three days and if he fails to meet this deadline he waits a further fifteen days. The farmer brings his cane to the collecting point where he or a delegated 'middle man' waits in a queue for it to be weighed. He may wait for four days or more until his own load is ready to be taken by a truck. Only then is the load weighed (the weight may have been reduced by over 50% through drying out in the waiting time), a receipt given and responsibility accepted by the mill for the sugar cane. The cane is then transported to the mill by truck where it passes a long line of bullock carts waiting to

deliver direct to the mill. Farmers close to the Mahendra Rajmarga collecting station may take their sugar cane to the mill the first time but after that they must take it to the nominated collecting station. Larger farmers with sufficient cane and access to a truck can deliver directly to the mill but tractors and trailers must use the same procedure as bullock carts and thus are rarely used due to the considerable waiting period involved. The relative prices of cane at the collecting point and the mill indicate an implied figure of about Rs.0.25 to Rs.0.50 per ton kilometre depending on distance to collecting point. Even over shorter distances this gives an extra payment of only around Rs.8-10 per bullock cart load for one day's journey time (assuming that waiting time at the mill and local collection point are about the same). Even in the agricultural slack season such a payment is almost certainly insufficient to encourage farmers to use their own bullock carts to make the journey from more than twenty kilometres away, even when using a motorable road. In these circumstances the importance of a motorable road network to the cheap operation of the sugar mill would be difficult to underestimate. In fact, it is difficult to envisage the mill operating at all without roads provision, since co-ordination and congestion problems at the mill would be almost insuperable (the mill dealing with about 8,000 producers in a six-month season). All cane-producing farmers gain financially from the presence of the mill but the strength of the mill's bargaining position leaves all the cash flows uncertain and a risk of cane weight losses with the farmer, although large farmers can avoid the risk by using their own trucks. Without the roads, a farmer with one bigha (0.67 hectares) producing at least Rs.10,000 as gross cash crop income would have to choose between growing the major alternative crop (paddy) implying six bullock cart loads or

growing sugar cane and taking eighty loads. It is possible to calculate that not particularly long journeys are required before paddy may be grown in preference to sugar cane despite quite considerable possible premiums measured at the point of production. Even if half the sugar cane were turned into gur it would still require twice the transportation effort and in addition about Rs. 400 to convert the sugar cane to gur. In these circumstances it is quite justified to hypothesize that the spatial concentration of sugar cane production is clearly related to the road network and will show a tendency to remain clustered around collection points which in turn are either very near to or on motorable roads - either Indian roads which are used to take the cane to Bhairahana through India, as well as on the Mahendra Rajmarga. It thus appears that the growing of sugar cane as a frequent but spatially concentrated commercial crop in the study area is a function of the provision of roads although other factors may be important in determining which specific farmers and areas grow sugar cane. It is probable that the opening of the Lumbini road (and the Indian sector of the Mahendra Rajmarga to the west of Butwal) will produce more growers of sugar cane (also there is the prospect of a projected mill at Krishnagar). However, advantages of growing sugar cane even close to roads are offset by the marketing structure faced by a farmer selling sugar cane to the mill. The mill presents the farmer with a receipt for his sugar cane at the time it is weighed which is a promise to pay the farmer at the agreed fixed price within three years. There are obviously strong feelings about this among farmers and the precise facts of payment dates were hard to discover. Although it does seem that payment is usually made before the end of the stipulated period, delays of one year or more do occur, causing cash flow problems for

some farmers who are thus unwilling to utilise further land for sugar cane which could put paddy consumption at risk. Although the mill claims to be prepared to accept endorsed bills it is perhaps surprising that in an area with widespread illiteracy and high informal sector interest rates, a secondary market in bills does seem to have emerged. It is an understatement to say that in a time of crisis small farmers have little reason to hope that the discount rate offered by those willing to purchase bills would be generous to them.

Thus road provision in the terai (the Mahendra Rajmarga and those roads in India still used to transport cane from producers near Tribeni to the mill at Bhairahawa) has undoubtedly encouraged the production of sugar cane by peasant producers as well as by larger farmers and employers of labour. However, the monopsonistic position of the mill has allowed it to impose conditions of collection of the cane which absorb much of the advantage which roads might have brought to the producer.

d) Lastly we turn to ginger production. Dried ginger (sothi) has been produced for many years in the hills and portered to Butwal and other small terai-hill interchange points such as Parasi and Tribeni. In a sample of forty producers in Palpa District (the chief area of production, see Figure 4.IV), only two had employed others to cultivate the crop. The average household production was 125 kg., with two producers exceeding 600 kg. However, in a number of cases the amount of seed used was in excess of the yield. A wide spread of land holdings was evident in ginger production, and implied a wide variation in the degree to which households were forced to buy in grain (60% purchased grain) and the means by which they raised cash - since ginger production in many cases failed to provide the entire source.

Our interviews revealed a significant increase in ginger production which preceded a sharp price rise in 1974 (from Rs.1.50 per dharni to up to Rs.8), although official statistics show no such increase (neither do they record the more recent upsurge). The earlier increase was directly encouraged by road provision in the following way. Upon the opening of the Siddartha Rajmarga, ginger producers still preferred to dry their ginger and reduce it to a higher-value/lower-bulk commodity (sothi) since they still portered it to Butwal (using the metalled road but on foot in many instances) and to Tribeni. It was not until 1975, two years after the opening of the road, that merchants set up establishments in the hills along the road to buy fresh ginger, notably at Aryabhanjyang which is the point at which the major east-west trail from eastern Palpa joins the road, and more recently at Khaireni and Majua Khaireni on the Prithvi Rajmarga, tapping the ginger-growing area of northern Tanahun District. Apart from any secular price increases taken by producers from the Indian export market, the sale of fresh ginger to dealers nearer the point of production represents a real increase in the possibility of cash earnings. One dharni of sothi requires six times the weight in fresh ginger and also three or four loads of firewood. At 1975 prices sothi fetched Rs.21 per dharni, while fresh ginger fetched between Rs.3 and 6 (with a mean value of about Rs.4.75); hence the sale of fresh ginger offers a greater return per unit of production, savings in fuel (which in the seriously deforested areas of Eastern Palpa and Tanahun are particularly important), and in portorage to Butwal. The increase in fresh ginger production at the expense of dried ginger can be seen in Table 3.II.

Hence road provision has greatly increased the opportunities for peasants to enter or increase production of ginger on a small

TABLE 3, IX: Export of ginger through Bhairahawa

	1971/2		1972/3	
	Output Kg.	Value Rs.	Output Kg.	Value Rs.
Dry Ginger	390,786	2,542,182	691,564	1,757,842
Fresh Ginger	14,698	16,462	23,776	21,687
	1973/4		1974/5 (9 months)	
	Output Kg.	Value Rs.	Output Kg.	Value Rs.
Dry Ginger	675,862	2,922,542	207,021	599,105
Fresh Ginger	1,246,364	890,319	1,188,629	759,987

Source: Nepal Rastra Bank Survey of Palpa

scale for sale, particularly those without khet land. It was road provision that allowed the form of the marketed product to change and hence increase the profitability of ginger production, particularly in view of the easing of the need for fuel to dry the ginger. Also it enables savings to be made in the journey hitherto made to Tribeni and Butwal to sell dried ginger. However, it is important to recognise that at the same time as road provision, prices for ginger increased greatly. Part of the reason was that the Gandhaki irrigation project in India started to raise the opportunity cost of ginger production to such a level that paddy replaced it, thus creating a demand for ginger which was met by the hitherto marginal

Nepalese hill producer. Undoubtedly the considerable price rises in ginger would not have led to such an increase in the number of peasants entering production without the facility to market fresh ginger near points of production. In fact, one small ginger-drying plant has been set up at Khairnithar on the Prithivi Rajmarga and another is planned for central Palpa in the heart of the main producing area. Even such modest development in processing would have been impossible without road provision. However, the profitability of ginger is highly uncertain because of insect attack which often means that yields amount to less than the input of seed ginger. Our surveys in Palpa and Syangja never found an instance of any government official visiting ginger farmers.

A long-established trend which road provision has tended to accelerate is the decline in the bista arrangement by which customary payments in kind are made to blacksmiths, shoemakers and tailors. A combination of factors, prior to road provision, had been responsible. First, a declining domestic economy had encouraged households to make economies in their use of these occupational castes and the only way this could be reflected in payments was to go over to a cash payment for services rendered rather than a lump payment in kind each harvest, irrespective of the level of demand of the household for the preceding time period. Secondly, manufactured items from India (particularly shoes and ready-made clothes) had penetrated the domestic economy both because of internal collapse of the growing of cotton and its spinning in the hills, and because of aggressive policies pursued by Indian manufacturers secured through trade agreements by the Indian government.

Lastly, a taste for the more fashionable ready-made clothes and shoes on the part of the younger generation near towns had led to the inability of some tailors and leatherworkers to keep some households in their respective bista. Road provision has certainly accelerated this process, encouraged a proliferation of retail outlets of shoes and factory-made clothes (see also Chapter 4), and the mobility of customers themselves. Even village blacksmiths find that other blacksmiths without their own bista frequently set themselves up at the roadside to sharpen sickles and undertake repairs to ploughs, kitchen ware, etc., on a cash basis, with the result that the traditional bista is sapped of members who prefer rather to deal on a casual basis with occupational castes. For example, on a stretch of the Siddhartha Rajmarga between Bhairahawa and Butwal (23 kms.) sixteen casual tailors and blacksmiths have set up at the roadside.

The consumption patterns of households involved principally with the peasant form of production have been little changed by road provision. First of all, their involvement in the market is very small indeed, and, secondly, essential items imported for household use are generally of a high value-low bulk nature (e.g. kirana (miscellaneous household) goods, kitchen ware and salt. Price reductions following road provision have been very small (see Figures 6ii-6v, p. 6.22 in Vol.III). Only salt showed a substantial maintained decline in price, while rice, sugar and black pulse showed small decreases in the order of ten per cent. These reductions were almost all overtaken by secular rises in prices of imported goods, partially due to fluctuations in the Indian-Nepalese rupee value. Sialer and Schroeder (1971) calculated that the net direct income effects of a family living in Pokhara earning Rs.1,684 (in line with

many middle peasant households) due to price reductions was only Rs.27.30. Tests to show substantial differences in the consumption of items with high importation costs in on, near and off-road locations failed to show significant differences.

(ii) Employers' production

Agricultural production on the part of employers includes both the semi-feudal and capitalist forms of production, but excludes advantaged peasant producers who hire in labour the cost of which is less than Rs.200 per year. These latter peasants, frequently with non-agricultural income (e.g. army remittances or a pension) tend to keep within the domestic form, balance their household budget and do not seek to accumulate by investing in their farms or seeking to reduce what small employment of wage labour that they do enter into at certain times of the year. Many employers have businesses and these have a high concentration in on-road locations (see Table 4.10, p. 4.42, Vol. II).^{*} However, there is a real danger of attributing the prevalence of both businesses and the larger farms which employ labour to the position of the roads - i.e. implying direct spatial causality. The interpretation preferred is that employers of agricultural labour tend to establish other non-agricultural enterprises more readily if they find themselves on a roadside location. In the case of mills and shops, the greater customer potential of a roadside location is a particularly important advantage, while transport companies obviously require managing from a roadside location. Hence it is from a set of employers of agricultural labour, with the advantage of the ability to accumulate

^{*}In this discussion, 'on-road' means at the roadside or within a matter of hundreds of metres, 'near-road' means up to half a day's walk from the road, and 'off-road' means more than half a day's walk.

surpluses from farming, that a sub-set find themselves near a road. Of this sub-set a few take advantage of this new opportunity which a road provides and invest surplus from agriculture (and perhaps from remittances outside agriculture, but which may not be road-related, such as a military pension) into an enterprise which does rely upon the changed situation in trade and transport which roads have allowed. However, the Siddartha Rajmarga largely follows the old portage trail and in some cases business establishments, relying on passing trade, pre-date road provision. To take an example, the village of Armadi (in Syangja District near Walling) was located on the portage trail and is now located on the road. Many shops simply enjoyed larger business from the passing trade, while one farmer (and employer of labour) who owned horses and mules for a haulage enterprise sold them and invested in a bus and truck. It is quite clear from rural survey data that the great majority of employers of agricultural labour do not minimise aggregate payments to labour, nor deploy their surpluses in an aggressive and expansionist manner. While the ability to accumulate is limited to employers either with non-agricultural income or with large farm sales, their surplus is not used to make purchases of land, buffaloes, oxen, bullock carts and machinery. Median and mean measures of investment trends are unreliable since investment is usually lumpy, but only 34% of all employers invested any money in improving their productive bases during 1973/74. Fertiliser use which may seem, in comparison to other producers, to be generous is, on a per hectare basis, still low and amounts to about 7-8% of all cash expenditure. However, both investment in capital equipment as well as new inputs are highly concentrated in a few households, giving a strong positive skew to the distributions of these variables, and it is these which exhibit

capitalistic tendencies. In fact a vast majority of these households are situated in the terai where the surpluses, cash flow and investment in both agricultural and non-agricultural means of production are greater. However, mechanization has been slight, real labourers' wages have remained constant, and expansion of landholding by a capitalist class at the expense of the poor peasant who thereby becomes a landless labourer have all failed to emerge as strong trends.

The use of fertiliser and new seed is one of the few components of a strategy that could lead Nepal away from the disaster which threatens to overtake it. At present the use of new inputs is, as we have indicated, restricted to a very low density of application by a few producers, primarily on or very near roads, and a higher proportion of employers, again with a strong road bias. The reasons for a slightly higher adoption of new inputs by employers are the existence of a positive cash balance in the household budget (see Table 4, VII, p.4.38, Vol.II), and the fact that other resources are available to the employer's households both on-farm (such as irrigation facilities, which implies considerable cash resources to purchase a pump-set, or to hire labour to construct a channel from a stream) and in the form of access to the bureaucracy to raise loans. The cumbersome machinery for raising a loan (including no less than five different government agencies) undoubtedly discourages many households from overcoming the lack of cash savings, particularly those households who have a limited 'social' access to members of the bureaucracy, as well as 'physical' access (i.e. travel time, which road provision drastically reduces).

The strong distance decay of fertiliser and improved seed use from metalled roads in the hills is borne out both by our intensive farm surveys as well as our location stratified random sampled rural surveys. In the three roadside towns of Walling, Sisva and Majuna

Khairani, 7.4%, 5.6% and 8.9% of farmers used some fertiliser in 1974/75, and these were drawn predominantly from employers who had thus the necessary means for accumulation. Of those users, the rate of usage is usually below half that recommended by the A.I.C. (Agricultural Inputs Corporation). Although there is considerable cross-subsidisation in favour of the prices of fertiliser at agents' depots far from metalled roads, there is a strong disincentive for dealers (who are the lowest level of the distributive hierarchy and who are responsible for sale of the fertiliser to farmers) to actually transport the fertiliser to the farmer. At present dealers have to sell to farmers at the same fixed price unless sales involve delivery transport of more than 7 kms. from the agent's shop or depot. In addition, there is a very strong road-bias in the location of most agricultural input distribution centres (see Figure 5.1, p. 5.77, Vol. II), which further accounts for the fact that those households which have the complementary resources hardly use fertiliser at all over one hour's journey from a road. In the terai fertiliser use is wider-spread since khet land is wider-spread and there is the opportunity for a larger number of producers to accumulate enough cash savings to purchase fertilisers. However, the purchase of new inputs, including investment in machinery, is highly concentrated and is found in about three or four households (all in the terai) out of a sample of six hundred, and these few show no special spatial concentration near terai roads. It is these households which have shown distinct capitalistic tendencies, in that their surpluses are reinvested in the purchase of more land, machinery, livestock and fertiliser and new seeds. These households too tend to employ wage labour and not to keep as high a proportion of 'permanent' labour and household servants (involving the whole cost of the reproduction of

labour). It will be interesting to see the results of the most recent initiative to attempt to diffuse widely the use of new inputs by saturation coverage (under the auspices of the Rockefeller Foundation), which will be started shortly. It is the opinion of this team that it will not be the lack of road transport which will inhibit its success but the nature of the forms of production and the doubtful profitability of fertiliser in view of recent price rises.

In summary, the effect of roads upon employers of agricultural labour has been more marked than in the case of peasant producers, although even this has been slight. However, it is only the employer who finds a "windfall" opportunity for increased accumulation which roads sometimes provide who tends to use his surpluses for non-agricultural enterprises. The lack of motorable roads did not prevent producers from marketing food grains. In the hills there are many grain-deficit households with cash incomes so that households can sell any surplus grain locally. In the terai road provision has certainly centralised marketing of paddy and rice (see Chapter 4) but has not fundamentally altered the approach of producers to the market. The prevalence of bullock carts and a ready market in India for surplus grain at a wide variety of points of sale ensured that transportation costs did not stand in the way of the sale of surpluses. Although sales of grain for local consumption are not common (since labour is paid in kind and few households owning land are deficit in grain), distances between points of production and sale are not large. In any case the very attractive price differential between Nepal and India for rice attracts Indian middlemen to buy rice in Nepal who thereby stand the cost of transport of the produce to points of consumption. Hence, in both pre-road and post-road periods the strongly

surplus households, who were also employers of labour, tended to continue to sell paddy or rice in the same proportions to that consumed or paid out in non-market transactions. The pressures of a declining resource base and increased numbers to feed from the farm have not yet been felt by employers of agricultural labour to the extent that a more income-maximizing deployment of resources and sale of produce has been followed.

The labourers employed in both semi-feudal and capitalist farms have been practically unaffected by road provision. Wage labouring households constitute 28.5% of all households. They constitute a group which has not been able to respond to increasing pressures of population by varying land use. Amongst their numbers are 1) domestic producers of a generation or more ago, now unable to meet even half of their grain requirements from their own land either due to a distress sale of land or perhaps landlips compounded by the failure of alternative sources of income; 2) displaced occupational castes who are unable to earn a livelihood from traditional occupations within the domestic form of production; 3) immigrants from India hoping, after some years of search, still to be able to squat on land illegally (i.e. become a sukubasi) or to earn enough by their labour (and financial support from relatives in India) to buy some land. It is easy to understand that such a disadvantaged group enter little into the regional or national market for the purchase of food grains (since payment for labour is often in kind, or, when in cash, is used to buy grain from locally surplus households). Their expenditure on household goods too is very limited (Table 4.X, p. 4.46, Vol. II), and the very small reduction in prices of these goods following road provision is of negligible importance to this group. The inability of the economy of Nepal to provide non-agricultural incomes (see the discussion about the political economy of Nepal and

also (Chapter 4) means that roads have had no stimulating effect in reducing the level of rural unemployment and poverty. The outlook, then, for a quarter of the population is bleak indeed and no change in the productive forces (whether roads play a role or not) which might alleviate their deteriorating condition can be foreseen in the immediate or middle future.

(iii) Road provision and personal travel

While the effect of roads upon production has been extremely small, it has certainly revolutionised personal mobility for those households with cash surpluses. A rough estimate of personal travel costs in pre-road conditions can be made as follows:

Before the opening of the Siddhartha Rajmarga in 1968 a porter carrying a standard load of 35 kgs. took thirteen or fourteen days on a round trip between Pokhara and Butwal. At current prices and assuming similar consumption habits, the porter would spend between 10 rupees and 15 rupees per day on food and drink. Carriage of one's own food is associated with groups of six or more so that one person can carry the food and cooking utensils and prepare the food for the whole group. From our patchy recall data on group and individual travel, however, it seems that 10 rupees per day at current prices is not likely to be an over-estimate. A calculation of the net cost of the trip can be obtained by subtracting the monetary value of fourteen days' meals prepared at home from data provided by the rural survey. A net daily expenditure per person when travelling on foot at today's prices is estimated at 6 rupees; the Pokhara to Butwal trip would thus have cost 84 rupees, while the current return fare with that load is 62 rupees. It is this monetary saving (but as importantly the reduced time and effort)

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which bus travel offered that largely contributed to a marked change in the travel habits in the hills and the terai.

There are no data about travel habits before road provision and we have had to resort to a substitution of time by space to estimate possible changes of travel habits as a result of road provision.* In such an analysis we make the assumption that off-road journeys (defined as journeys in which there is no segment in which the traveller went on a bus, truck or car) in 1975 represent a 'pre-road' situation.

TABLE 3.X: Reasons for travel in study area

Reason for travel	'off road'	Siddhartha Rajmarga	Prithvi Rajmarga
Sell or buy goods	57%	18%	13%
Military reasons (pension, leave, etc.)	18%	12%	9%
Visit relatives, friends, etc.	13%	26%	27%
Govt. officials for official reasons	4%	13%	14%
Visit government officials	2%	5%	8%
Agriculture	2%	6%	5%
Medical (self or visit others)	1%	5%	5%
Other reasons	2%	13%	17%

Source: Traffic Survey, 1974/5

Table 3.X shows the reasons for travel for persons on completely off-road journeys and those using one or other of the two hill roads.

*The Transport and Road Research Laboratory are currently analysing some of our data as a part of a project on personal mobility in lesser developed countries, under the direction of A. Plumb, and we expect a more adequate treatment of this topic to emerge.

If our space-time substitution assumption is broadly valid, the following conclusions can be drawn:-

1. Social visits (the use of transport facilities as a consumption good) increased very considerably after the provision of roads.
2. Both government officials as well as the public on government-related business make considerable use of road transport, accentuated by the fact that many administrative centres are now joined by road or have been shifted to an on-road location.
3. Roads have improved accessibility to medical facilities.
4. Although most travellers still walk to sell or buy goods (since, as we will explain, many break-of-bulk points on the road act as markets for purchase of imports and the sale of exports to middlemen), road traffic has met a considerable demand for traders and merchants (as opposed to producer/consumers) to travel both with loads (usually high value, low bulk) and without loads (either to buy goods or merely to negotiate a large purchase which will then be transported by truck). That is, a shift in type of economic actor involved in selling and/or buying.

CHAPTER FOUR: URBAN ECONOMY AND SOCIETY

1. Introduction

In the previous chapter we argued that, in general, roads have had a remarkably slight effect upon the development of the productive forces in agriculture within the region, despite limited increases in the production of certain specific crops. Among certain sections of the population however, even if they do constitute a tiny minority of the total, the building of roads did generate significant changes. Most directly affected were trading and commerce and the closely associated transport and haulage sectors. Also, the construction of motorable roads linking the national capital, Kathmandu, with the regional capital, Pokhara, and connecting Pokhara to the terai and India has facilitated the movement not only of commodities but also of people. The possibility of rapid movement of government employees by motorised transport along the new roads, together with the increased facility of importing and transporting Indian and other foreign manufactured goods have together ensured that the government policy of enlarging local bureaucracies outside the capital could be rapidly implemented. The swift emergence of trading centres along the new roads attests to the importance of new modes of transport for the location of commercial and haulage activities closely associated with expansion for the maintenance of a vastly enlarged bureaucracy.

Despite the growth of commerce and the expansion of the bureaucracy however, formal employment opportunities remain few and the capacity of the private and public sectors in the urban areas to absorb even the incremental population in the rural areas is inadequate. For, although a degree of expansion has taken place in the sphere of

non-agricultural production, located primarily in or around the urban areas (such of it to service the bureaucracy), activity in manufacturing remains extraordinarily low and much of the output comes from small-scale family concerns based on artisan or petty commodity production incapable of rapid expansion. Here, as in agriculture, little development of the productive forces has taken place; in fact, small-scale production (in metal-working and weaving) shows all the signs of imminent disappearance as a result of long-standing competition from Indian manufactured goods and many industrial establishments are merely repairing or servicing workshops. The provision of roads (particularly those joining the Nepalese hills to India) therefore has accelerated the secular decline of 'traditional' manufacturing.

2. Growth and decline of towns

Outside the Kathmandu valley, towns were almost non-existent in Nepal until the last decade. Administrative centres and a few trading posts dominated by small Newar communities (who had emigrated from the Kathmandu valley) were the only 'urban' concentrations. In the study area only Pokhara, Tansen and Bandipur constituted settlements of any size (although all having less than 5,000 inhabitants at the turn of the century). The extension of the Indian rail network towards the Nepalese border around this time, associated with the further growth of trade with India, resulted in the establishment of a number of entrepôts, in the terai and the outer hills, near the railheads. Manufacturing establishments (e.g. weaving in Bandipur and copper and brass work in Pokhara and Tansen) collapsed in the face of Indian competition and were removed

as any basis for urban settlement.

Between 1962 and the present (1976), however, the towns of west-central Nepal have, with few exceptions, grown very considerably. Pokhara, for example, had emerged by 1965 as the largest and most important town of the region, with a population of some 17,000; by 1971 the population had grown to around 20,000 and in 1976 was probably in the region of 30,000.

The three most important factors in the growth of towns in the region during the last ten years have been the expansion of the bureaucracy, the construction of two major roads through the hills, and the overall increase in the volume of trade, predominantly in imported goods.

The construction of the Siddhartha Rajmarga linking Pokhara with Butwal and Bhairahawa to the south (and hence to India) which began in 1965 was completed in 1969, certain sections of the road having been open to motor traffic prior to that date. The Prithivi Rajmarga which now connects Pokhara to Kathmandu was begun in 1967 and finished in 1971 (although not officially opened until 1973). It is, however, impossible to relate the growth of, for example, Pokhara directly, and certainly not only, to the building of these roads and their subsequent use for transporting goods and persons into and out of the town; for during this period Pokhara was designated not merely District and Zonal headquarters but also the regional capital of the West-Central Planning Region. Between 1965 and 1975 the number of government offices in Pokhara increased from 17 to 75, thereby dramatically increasing the number of government employees in the town and producing a very considerable direct and indirect effect on the size and functions of Pokhara. In addition, growing pressure on the land in the surrounding rural areas during

this period led larger numbers of peasant producers in the vicinity of Pokhara to come to the town to purchase food grain as well as imported goods, while the general increase in population in the hills, together with a decline in local handicraft manufacturing, produced an increased aggregate demand for imports and corresponding expansion in the commercial sector. These events were not merely chronologically coincident, but were inter-related, in that, for example, the decision of government to designate Pokhara a major centre was not unrelated to plans for road construction and vice versa.

Despite these difficulties in disentangling causal nexuses there is no doubt that a significant factor in the recent rapid growth of many urban centres and in the development of a number of entirely new urban centres, is the building of the two major roads. Data on the dates of establishment of businesses in urban centres throughout the region support this assertion, as do other data (see Table 4.I). There are strong indications, for example, that on-road centres experienced a more rapid rate of growth than those off the road, while contemporary reports indicate a striking response in terms of population movement and migration, to the building of the roads.

The only towns which appear to have suffered a decline and an actual as well as relative reduction in resident population are Butwal and Bandipur, both previously major trading centres and now both losing commerce and inhabitants to smaller, rapidly growing centres on the nearby actual roadside: Khasauli, in the case of Butwal, and Dumre (primarily) in the case of Bandipur. The rate of growth of the small, new urban centres on the road is significantly greater than that of centres off the road, of whatever size. This

TABLE 4.1: Urban growth: based on date of establishment of existing businesses

Town	Number interviewed	% established				
		since 1972	1968-1972	1964-1968	1955-1968	before 1955
1. Terai, on Siddartha Rajmarga						
Bhairahawa	104	2.9	60.6	16.3	13.5	6.7
Butwal/Khasauli	123	19.1	22.4	19.9	11.0	27.6
Terai, off Siddartha Rajmarga						
Parasi	11	9.1	63.6	27.3	-	-
Tribeni	5	-	20.0	20.0	20.0	40.0
Tauliawa/Kapilvastu	18	16.7	5.6	11.1	27.8	38.9
2. Hills, on Siddartha Rajmarga						
Pokhara	86	32.6	36.1	10.5	12.8	8.1
Tansen	62	12.9	40.3	12.9	19.4	14.5
Valling	34	44.1	32.4	17.7	5.9	-
Syangja	24	33.3	55.8	16.7	4.2	-
Arnadi	12	33.3	58.3	8.3	-	-
Aryabhanjyang	9	33.3	55.6	-	11.1	-
Putlikhet	12	16.3	33.3	8.5	8.5	33.3
3. Hills, on Prithivi Rajmarga						
Damauli	21	57.1	38.1	4.7	-	-
Majuva Khairani	21	38.1	61.9	-	-	-
Dumre	19	57.9	36.8	5.3	-	-
Rimalnagar	6	16.7	83.3	-	-	-
4. Hills, off road						
Baglung	40	27.5	20.0	20.0	22.5	10.0
Pokharithok/Gorkha	22	27.2	36.4	13.6	4.5	18.2
Karna	15	40.0	26.7	13.3	-	20.0
Bandipur	11	36.4	9.1	27.3	18.2	9.1
Patherkot	3	66.7	-	33.3	-	-

observation includes larger centres on the road which have grown at a faster rate than the larger centres off the road. Like Pokhara, many of these fast-growing centres not only lie on the road, but have also experienced very considerable expansion of the government offices and facilities located within their boundaries; some, like Dhamuli, did not exist prior to the coming of the roads, and simultaneously experienced an influx of officials together with road provision as administrative functions were moved from Bandipur.

If it is to be possible to assess the effect of road construction on the growth and decline of towns in the region it is necessary first to make some assessment of the impact that the expansion of the bureaucracy has had upon the growth, total size and economic and social structure of the towns.

3. The bureaucracy

The rate of growth of the bureaucracy and the overall absolute increase in numbers, of offices and of official personnel, in west-central Nepal have been dramatic, over the past five years in particular. In Pokhara for example, the number of employees has risen so that the number of civil servants is probably about one third of all wage-workers in the town and possibly more. In the towns of Pokhara, Baglung, Parasi, Syangja, Damsuli and Lamjung where investigations were conducted by Project members, the total number of government employees in offices, according to our own estimates, amounted to nearly 3,500. If it is assumed that each employee will have on average four dependents, then the population supported in whole or in part by earnings from government employment in the region (17 District and 32 Zonal Headquarters) amounts to somewhere in the vicinity of 30,000. This does not take

into consideration the very important multiplier effect on the manufacturing, commercial and other business sectors and the corresponding growth in resident population and economic activity. In fact, wages and salaries account for the greater part of the administration's expenditure, although large amounts of money are spent on such items as rent, repairs to buildings and equipment, replacement of old equipment and purchase of new, stationery and minor office items, and maintenance of vehicles (in the towns where vehicles can be used), all of which have some local multiplier effect even if most of the equipment and paper come from outside the region (see Table 4.II).

Our survey of the administration shows that the capacity for the administration to stimulate effectively the productive forces of agriculture and manufacturing is extremely limited for a variety of reasons: rigid control from the centre leaving little autonomy and flexibility at the local level; low motivation of the large number of very low paid office workers; high turnover of personnel; corruption - all being aspects of a general inability of a bureaucracy hitherto concerned only with revenue collection to transform itself rapidly into a positive developmental agency. Thus while road provision makes possible the greater physical mobility of government employees, these other fundamental structural constraints chronically inhibit their effectiveness.

But if individual wages for the great majority of government employees are very low (less than Rs.200 a month), the aggregate wage bill for the bureaucracy in the region is massive. In Pokhara alone, the total annual wage and salary bill came to nearly Rs.5.5 million in 1974-75. Apart from the role that official agencies play in directly generating activity in, for example, construction,

TABLE 4.II: Break down of expenditure by the administration (Rs. per month)

Item	Fokhara	Baglun	Syangja	Parasi	Dumali	Lamjung
Local stationary	27,552	5,966	3,385	2,470	2,695	1,497
Vehicle maintenance	8,217	-	9	704	2,999	-
Other local expenditure	43,865	1,585	958	2,304	1,690	994
Other expenditure (Nepal)	3,833	1,040	4,763	10,112	6,474	1,337
Other expenditure (foreign)	4,794	-	191	16,264	8	-
Wages	475,156	135,253	79,775	78,531	70,869	54,891
Rent	51,832	8,152	5,238	16,750	4,288	3,474
Building maintenance	6,963	1,898	25	898	916	666
10% construction	27,529	2,078	5,387	284	663	73

Source: Administration Survey, 1974

furniture-making and printing, the sums paid to employees have a significant effect as a stimulus to local business, particularly to commerce. An analysis of the expenditure patterns of government officials in the major towns of the region suggests, however, that while the heavy expenditure on official salaries and wages is a crucial factor in the economic structure of urban centres and contributes to supplement many households' income (both urban and rural), this expenditure appears not to spread significantly to affect production in the surrounding rural economy. Furthermore, there is a tendency for roads, by reducing travel and transport costs, to contribute to some extent to the low level of production in the region by facilitating transfers across space of surpluses existing elsewhere, in Nepal or abroad, thus pre-empting local development in production. But it must be borne in mind that similar observations in urban centres remote from motorable roads, such as Baglung, suggest roads are only one factor in the failure of government expenditure to stimulate production for the market in the surrounding rural economy, and that other constraints have to be identified in the structure of rural economy and society itself.

4. Non-agricultural production and employment

As we have seen in the previous section, the bureaucracy is one of the major sources of employment in the towns of west-central Nepal and the very existence of the bureaucracy in a town contributes significantly to the expansion of economic activities such as commerce and transport. Such economic activity, however, also has its own dynamic independent of the growth and location of the bureaucracy.

The growth and decline in the various branches of 'industry' owes more to the evolution of the relationship between Nepal and India, for example, than to the expansion of the local and regional bureaucracy.

Industrial production in the region is carried out on a very small scale, both in terms of the value of production and the scale of plant. For example, in our survey of manufacturing establishments in 1974, only four firms recorded a starting capital of over Rs.200,000, and all of these were located in Bhairahawa. Thus 'industry' takes the form of enterprises involved in petty commodity production (that is, the production of commodities for sale without the employment of wage labour) and small capitalist production (in which small numbers of wage labourers, almost invariably fewer than ten, are employed) on the basis of a small initial investment and relatively low running costs.

Our survey of business establishments in the urban areas of the region shows that the proportion of businesses without employees varies from 89% in the towns of the hills that lie off the road, to about 35% in the towns of the terai where the bulk of the larger manufacturing and wholesaling enterprises are located. In hill towns off the road, no businesses were found with more than five employees and the same was true for the small urban centres on the recently opened Prithivi Rajmarga. On the older Siddhartha Rajmarga, only the long-established hill towns of Pokhara and Tanzen provided evidence of establishments with more than five employees, while in the terai the bulk of the larger establishments were concentrated in Butwal and Bhairahawa.

If this aggregate picture is broken down by distinguishing 'industrial' establishments from 'commercial' (including transport

companies in the former but leaving aside all those businesses more usually referred to as providing 'services') it becomes clear that industrial establishments are larger employers on the whole than commercial establishments as one would expect, given the different requirements for labour of production/industrial and circulation/commercial capital. In both 'sectors' the proportion of businesses without any employees - family businesses - is greater than the proportion of those with, except in the terai and Pokhara. The opportunities for employment, however, are everywhere extremely limited, even in the industrial sector in the terai towns (see Table 4.III).

To take two examples, of the manufacture from local ores of copper or brass kitchen utensils and the weaving of cotton, other factors than road provision had long been at work causing a decline in these industries to the point of extinction. Pokhara and Tansen had flourishing copper and brass manufacturing industries, supplied by locally mined, smelted and beaten copper sheets. The lack of forest resources to smelt the metal led to the importation of copper ingots from India, which was followed at the turn of the century by the importation of copper sheet. In the 'twenties, Indian manufacturers copied the traditional Nepalese designs and by more efficient manufacturing techniques and the use of cheaper alloys destroyed the local industry within a matter of a few years. Today the old copper vessels still used in the hills are being sold as copper scrap and finding their way to India. Roads came too late to serve the undoubted coup de grâce that would have resulted had this local industry lasted longer. Cotton weaving and dyeing in the region has a similar history - of local skills in the small towns and in the villages using locally grown cotton. The importation of raw materials from India, followed

TABLE 4,III: Employment in urban areas: industrial and commercial establishments compared*

Town	Industrial					Commercial				
	Employers									
	0	1-5	6-10	10+	Total	0	1-5	6-10	10+	Total
<u>Terai</u>	10	22	7	23	62	57	73	11	-	141
%	16.1	35.5	11.3	37.1		40.4	51.7	7.8	0	
<u>Hills: on Siddhartha Rajmarga</u>	18	6	2	1	27	63	18	-	-	81
%	52.7	29.1	14.5	3.6		80.5	19.5	0	0	
<u>Hills: on Prithivi Rajmarga</u>	7	6	-	-	13	33	3	-	-	36
%	53.8	46.2	0	0		91.6	8.4	0	0	
<u>Hills: off road</u>	16	5	-	-	21	51	3	-	-	54
%	76.2	23.8	0	0		94.4	5.6	0	0	
Grand total	51	39	9	25	123	204	97	11	0	312
%	41.1	32.4	9.9	16.6		67.4	29.4	3.2	0	

*Hotels, restaurants, teashops, medical halls, hairdressers, butchers, cinemas, photo studios NOT included; transport companies included under industrial.

Source: Commercial and Manufacturing Survey

by the eventual replacement of local production by mass-manufactured substitutes is a familiar pattern, to be found in other manufactures such as paper, shoes and agricultural implements. Road provision has, however, accelerated the final penetration of Indian mass-manufactured goods replacing the artisan-made articles in the villages. Blacksmiths, leatherworkers and tailors, traditionally maintained by a system of patronage by the households of the village, are finding themselves increasingly by-passed in favour of roadside-located craftsmen who are paid on a piecework basis by largely 'anonymous' customers. These jobs involve, in the case of the blacksmith, more repair work and sharpening of sickles than his village counterpart and, in the case of the leatherworker, more upon shoe and cycle repair than upon manufacture, unlike his counterpart. It is therefore undeniable that road provision has spatially concentrated the demand for these few surviving handicraft manufactures around points of maximum customer potential, and has encouraged the final demise of local commodity manufacturing which, in the more extreme cases, has even removed from the study area value added by means of assembly or repair. However, some minor growth sectors can be identified. For instance, in contradistinction to the decline of both local manufacture and the activities of village artisans the massive increase in the volume of manufactured imports from India and elsewhere has stimulated the rapid emergence over the last decade of a range of what might loosely be termed servicing and repairing industries.

Unlike the 'traditional' industries there is likely to be a growing demand for these services, but given the low entry costs competition is fierce. Technical skills are required and these serve to limit entry to some extent, but the number of men who have acquired some knowledge of such small-scale machinery and practised

electronics is quite considerable and this should not prove a critical barrier to entry.

Probably the most important area of expansion in this sphere has been that of workshops for motor vehicles of all kinds. The rapid increase in the number of cars, taxis, jeeps, trucks and buses, as well as in motorbikes and scooters, as a result of road provision, is directly responsible for the development of this branch of industry.

Entry costs vary considerably; it is possible to open a workshop with no more than a handful of simple tools and a certain technical expertise; for this reason a number of the smaller establishments are run by ex-servicemen or individuals who have moved into the field of self-employment after having worked for a period as semi-skilled and skilled labour in businesses owned by others. Such small establishments fall into the general category of petty commodity producers, using as they do little labour in addition to that provided by the owner(s) (many of these small businesses are joint enterprises). A few are larger and employ workers; these might be classified as small capitalist enterprises in terms of the relations of production involved and the possibilities of accumulation. Although there has been rapid growth in this branch, it has been growth from a tiny base, and even now, with the exception of Khasanli, facilities in the towns on the road for maintenance of motor vehicles are few and relatively primitive in terms of equipment. One result of this, combined with the fact that the majority of vehicles operating on the roads in the region are secondhand to say the least, is a poor state of repair and maintenance among motor vehicles generally, with a consequent high cost to operators in terms of running costs.

The expansion of the food production,

catering and hotel industry in urban centres is a function of the increased demand for such services, particularly along the roads, as a result of the expansion of those in employment in other sectors (notably in the administration), of the increase in the number of urban residents, and of the increase in travellers and tourists on the main routes through the region. The industry is a relatively large employer of cheap labour, but even so cannot be regarded as providing much in the way of multiplier effects through wages. Construction of hotels provides employment for a short period and contributes to the physical expansion of the urban areas, but much of the material used in construction is imported in any case and only a relatively small proportion of total construction development is accounted for by the growth of hotels. The expansion of the catering and hotel industry appears to have had an insignificant effect on agricultural production with the possible exception of an increase in milk and meat sales in the immediate hinterland of the larger towns. Hotels catering for foreign travellers tend to import a considerable proportion of foodstuffs and drinks sold, thus generating what can be termed large 'first round' leakages out of the region and so reducing any indirect effects that the industry might conceivably have produced in the agricultural and manufacturing sectors.

In west-central Nepal as a whole by far the most common form of industry using machinery is that involved with the milling and processing of food grains and of mustard seed for oil. The bulk of this branch of agro-industry is located in the terai, as is the case in other parts of Nepal: in five terai districts of Nepal, including one in the west-central region (Kapilvastu), rice/oil mills accounted for nearly 80% of all small-scale industrial establishments.

The large increase in oil and rice mills has been due to both the opening up of large tracts of land in the terai as well as the growing demands of the urban populations (particularly the hotel and restaurant industry linked to the growth of the bureaucracy and to a lesser extent and at fewer locations to the tourist industry). Hence it is not surprising that in the hills mills tend to be heavily concentrated in or very near to the towns or on the roadside, but in the terai the distribution is far more scattered, although even there the major concentration is in Butwal and Bhairahawa. The majority of rice/oil mills are relatively small enterprises, despite their use of machinery, both in terms of size of labour force and in terms of milling capacity. Most employ between one and four workers, although the size of labour force varies from place to place and tends to be larger in the terai than in the hills.

Apart from rice/oil mills, roads have affected a few establishments processing sugar cane (the most important being the Mahendra Sugar Mill at Bhairahawa), one or two firms using simple techniques to clarify ghee before reselling it on the Indian market, and one ginger-drying plant. The Mahendra Sugar Mill was established before the construction of the Mahendra Rajmarga and relied on the Indian road network for the transport of Nepal-grown cane to the factory. As has been stated in Chapter 3, road provision has assisted the profitability of the mill to some extent, but not, due to the mill's policies on the collection of cane from producers, the producers themselves. In the case of the hill-based ghee-purifying and ginger-processing plants, road provision has encouraged the collection and onward transmission of the product to the Indian market and it can be said that the Siddhartha Rajmarga was a major contributory factor in the establishment of these two enterprises. However, both of them

are extremely small-scale and suffer from irregular supply; also collection may be very vulnerable to future market fluctuations.

Table 4.V shows the location and type of loans made for enterprises by the Nepal Industrial Development Corporation, 1959-74.

TABLE 4.V: Loans made by NIDC, 1959-74

Type of activity	No./Dhanlaghiri	No./Gandaki	No./Lumbini
Transport	0	2	20
Textile production	0	7	1
Hotels	0	2	1
Rice/oil/flour mills	0	2	1
Workshop	0	0	3
Furniture production	1	1	1
Stone and slate	0	1	2
Brick and tile	0	1	2
Sugar mill	0	0	1
Ice production	0	0	1
Plywood production	0	0	1
Bakery	0	1	0
Match production	0	0	1
Dairy	0	0	1
Electricity	0	0	1
Other	1	3	3
	2	20	40

Source: NIDC Publication

The heavy concentration in the terai is again visible. Apart from the massive assistance to transport companies (most of which are registered in Lumbini zone because the vehicles are imported from India and usually registered immediately they cross the border) there

is evidence of support for workshops of various kinds (mostly involved in maintenance or repair of motor vehicles) and also for brick and tile factories and for stone quarrying and crushing in the terai. These last are both areas that have expanded considerably over the last five years as a result of the growth of demand for construction materials in the towns of the region. The construction firms are essentially transient in nature, often having no visible existence except on the site where construction is taking place, and represent in the clearest possible fashion the predominant underlying tendency of industrial production in the region: lack of permanence or any long-term financial commitment. Construction activities offer magnificent opportunities for the entrepreneur (as opposed to the industrial capitalist): investment in equipment is minimal and the workforce is predominantly casual and semi-skilled or unskilled. Whilst urban construction projects obtain manufactured inputs, such as cement, iron rods and other building materials from outside the study area, these constitute a small proportion of the total building costs (around 12% of house construction costs excluding payment for land) and thus, by the way, construction is an industry with relatively small leakages outside the study area. Access to finance of around Rs.50,000 gives the opportunity to tender for significant government or most aid-agency contracts.

In all of these industrial enterprises there are significant possibilities for capital accumulation, although there is a tendency in practice for the owners to be involved in other businesses as well and to move their capital in an opportunistic fashion between different sectors in order to take advantage of particular circumstances as and when they arise. The degree of financial commitment to a particular sector, or even to a particular branch of a sector, common in more

developed countries, is not found here, except in the largest factories. There is a widespread unwillingness to commit funds too inextricably to one form of economic activity, the essence of successful business enterprise being to keep assets as liquid as possible at all times. One consequence of this is that few establishments are maintained at adequate levels of financing over sufficiently long periods to become firmly established. Furthermore, in virtually all production enterprises, including the largest, much of the labour force is not employed throughout the year. The Mahendra Sugar Mill, for example, has its full complement only during the busy season of sugar cane processing; at other times of the year the numbers drop to around half. The same is true of other industries, such as the brick factories which do not operate at all during the monsoon months and retain a minimum labour force. Production in most industries declines in the summer months, not only because of the difficulties of production during this period due to the monsoon, but also, in part, because of the fact that the labour force, in general, also has commitments of its own within rural peasant economy which become particularly demanding around the time of planting (which tends to coincide with the onset of the monsoon). For various reasons, therefore, industrial production and employment in industry are highly seasonal and remain considerably dependent upon the weather and the demands of the peasant agrarian economy.

This marginality of industry is closely associated with the immense disadvantage of being located at the extreme periphery of the Indian capitalist-dominated economy with little protection from the existence of a national frontier which the Nepalese government has proved unable to use as a protective barrier behind which to

shelter its own industries. Under such circumstances it is not surprising that for owners and employees alike, industrial production represents more an additional source of income of a fundamentally unstable and transient nature than a major investment or sole source of livelihood. Neither employees nor employers, in this sense, can be regarded as 'committed' to industry, and industrial production is correspondingly feeble, unpredictable and fraught with problems. The inability of non-agricultural production to develop beyond this primitive state is a function of the predominance of particular forms of agrarian economy within Nepal under the dominance of Indian capitalism. In this situation the provision of roads alone can produce only a marginal effect on levels of production with a tendency to reinforce existing relationships.

5. Commerce

The low level of dynamism in production in Nepal, whether in agriculture or in manufacturing, is associated with a remarkable degree of activity in commerce. In so far as the building of roads has facilitated the movement of goods within the region, and particularly of imported goods from India and abroad, it has contributed to the expansion of commercial activity and also of the derivable demands on the transport sector. New roads must be seen however, as only one element in a complex evolving situation, the major components of which are the growing trading dependency of Nepal on India, increasing population and the difficulties associated with investment in productive activity. The fact that the commercial activity (and transporting) centres around distributing imported commodities is significant.

This section begins with a discussion of the relationship between retail prices and road provision in both time and space, and then moves to consider price formation by merchants and retailers. This is followed by a more general analysis of the changing structure of commerce within the region.

Data based on the Nepal Rastra Bank's price survey in Pokhara suggest that the opening of the Siddhartha Rajmarga resulted in few retail price changes which were not overwhelmed by price changes within one or two years as a result of inflation imported from India and the devaluation of the Nepalese rupee by 25% in December 1964 (see Figs. 4.I to 4.IV).^{*}

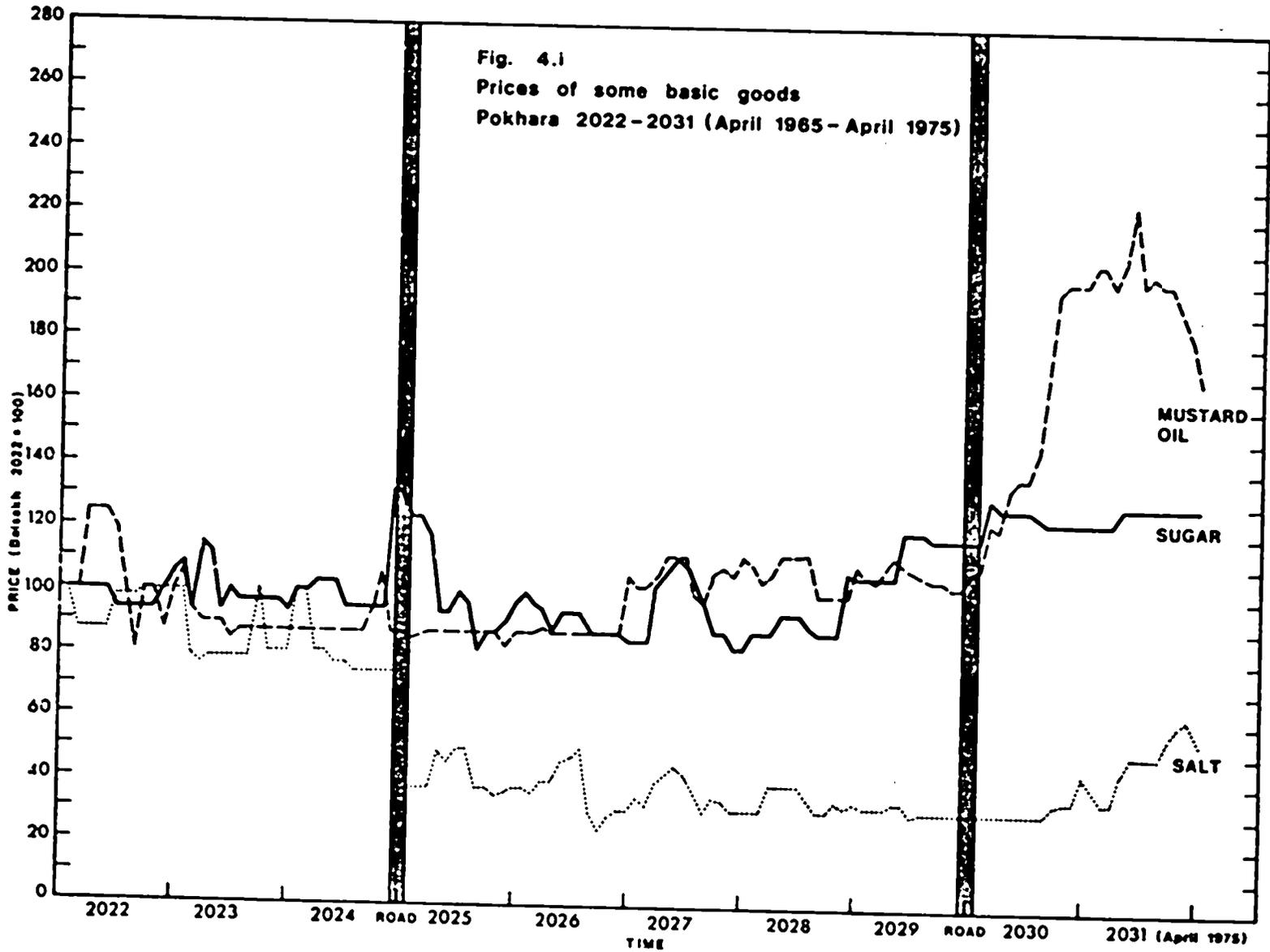
See p. 106

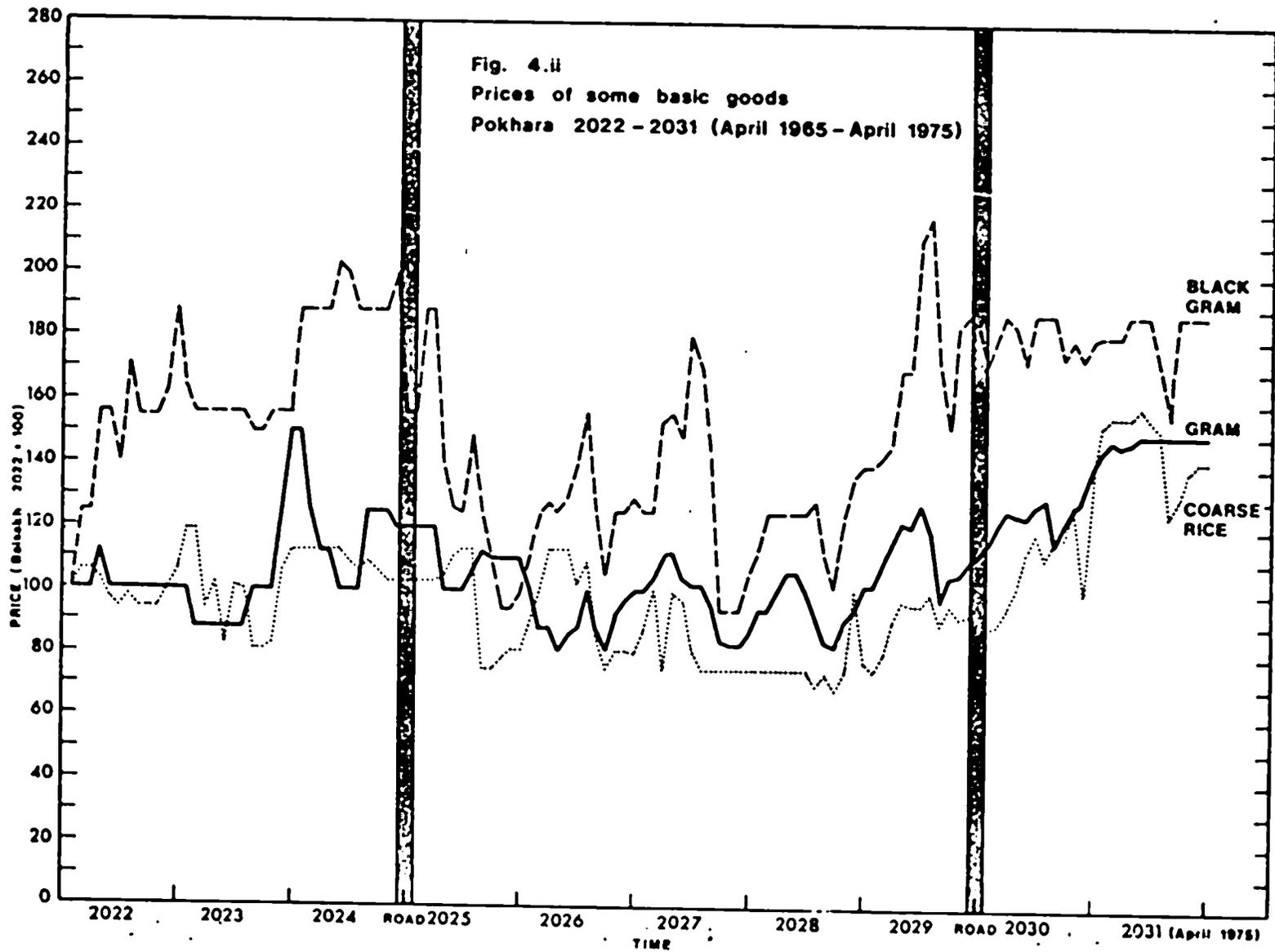
The findings of Goil (1971) and Sisler and Schroeder (1971) are reproduced in Tables 4.VI, 4.VII and 4.VIII, which, although not agreeing with each other in detail, suggest that rice, salt, sugar and black pulse were reduced considerably in price at Pokhara immediately after the Siddhartha Rajmarga was opened. Black pulse is produced in areas in the hills to which both the Siddhartha and Prithivi Rajmargas are aligned fairly closely; only in the case of areas near the former however did the improved accessibility of Pokhara reduce the retail price. These observations led to early optimistic conclusions on the likely medium-term impact of road provision despite the generally small benefits per household.

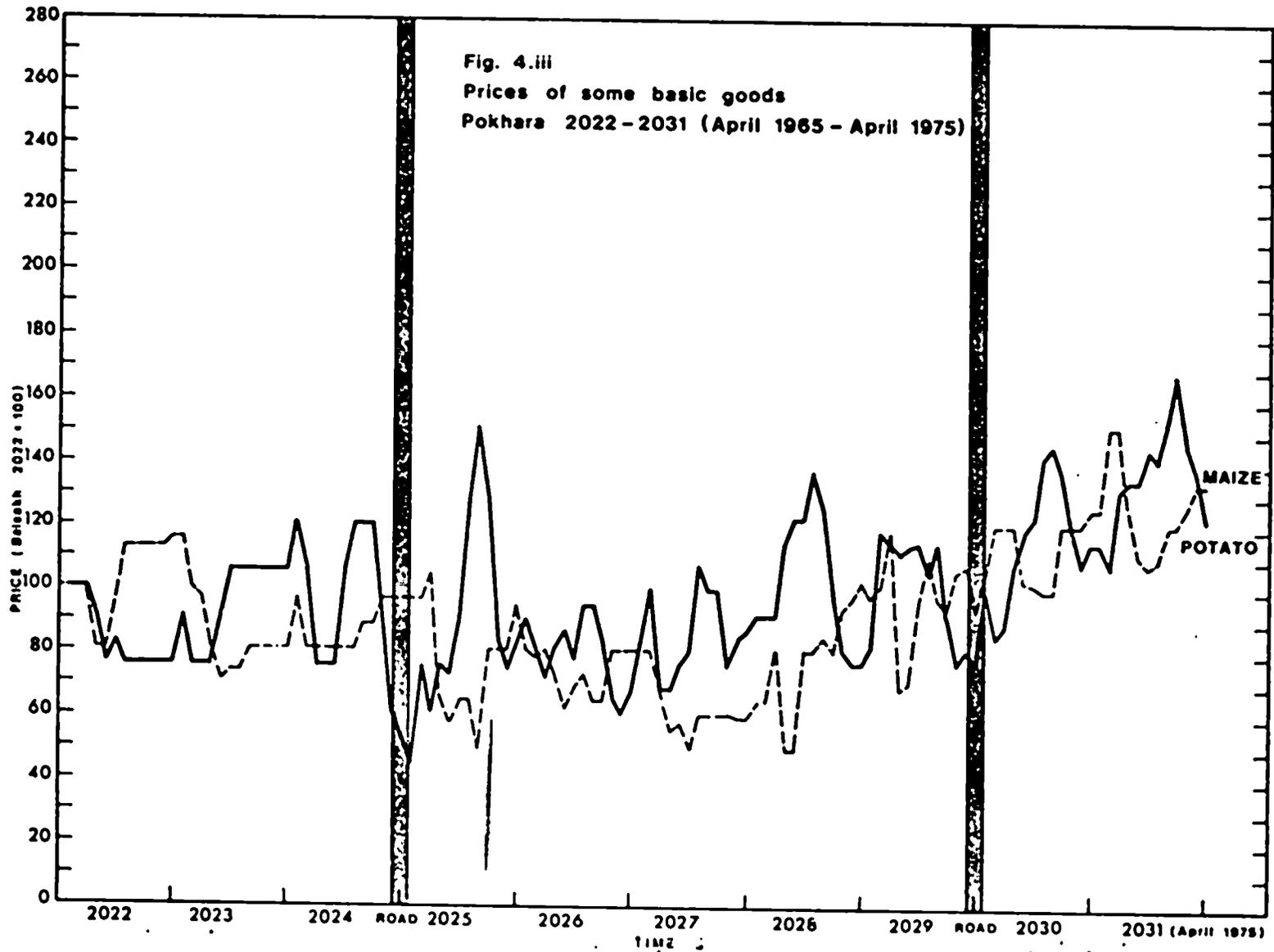
Because of the relative unreliability and paucity of data on historical prices, only very broad conclusions can be drawn: 1) transport-induced reductions in retail prices on many goods which were imported into the hills either via Bhairahawa or after the opening of the Prithivi Rajmarga via Birgunj and Kathmandu were

*Salt and kerosene which bear a high transport charge per unit bulk show a discernible fall in retail price in Pokhara; ghee, black grain (or pulse) are hill products so one would not expect Pokhara prices to be significantly affected.

1b)







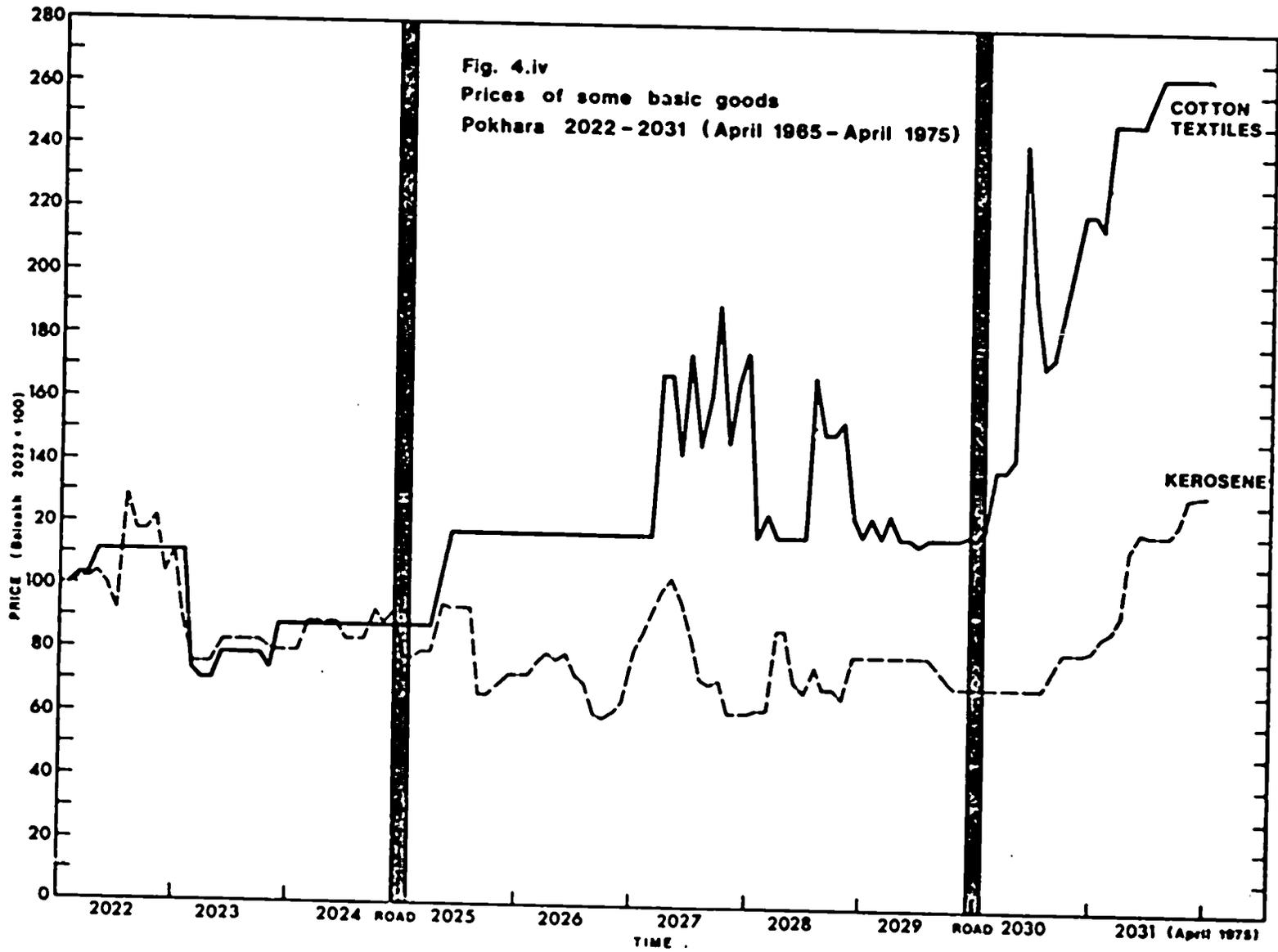


TABLE 4.VI: Price changes and the Siddhartha Rajmarga (from Gail, 1974)
(converted to metric measurement for this report)

Retail prices in Pokhara

Commodity	Dec'67	Apr'68	Dec'68	Dec'69	Apr'70	Dec'70	
Rice	255.10	239.25	174.00	188.50	232.00	232.00	Rs./Quintal
Potato	167.36	73.22	209.20	135.98	94.14	146.44	"
Salt	120.00	80.00	60.00	50.00	50.00	50.00	"
Sugar	338.91	470.71	313.80	313.80	303.34	366.10	"
Kerosene	33.00	35.00	30.00	27.00	42.00	33.00	Rs.18 ltr. tin
Mustard oil	249.09	284.68	249.09	249.09	249.09	284.68	Rs./Quintal
Yellow pulse	347.13	370.27	289.27	289.27	289.27	347.13	"
Black pulse	347.13	289.27	231.42	231.42	238.36	289.27	"
Ghee	462.60	533.77	569.36	569.36	533.77	533.77	"

TABLE 4.VII: Retail prices in Syangja

Commodity	'66-67	'67-68	'69	'70	
Rice	335.22	320.65	218.62	255.91	Rs./Quintal
Salt	140.00	90.00	50.00	50.00	"
Sugar	502.08	439.32	313.80	313.80	"
Kerosene	60.00	n.a.	45.00	30.00	Rs.18 ltr. tin
Ghee	427.02	n.a.	n.a.	559.36	Rs./Quintal
Oranges	8.33	n.a.	26.66	33.33	"
Black pulse	289.20	n.a.	260.28	231.36	"

TABLE 4.VIII: Retail prices in Walling

Commodity	'66-67	After May '70	
Rice	349.80	233.20	Rs./Quintal
Salt	180.00	50.00	"
Sugar	460.25	292.88	"
Kerosene	60.00	25.00	Rs.18 ltr.tin
Ghee	355.88	569.36	Rs./Quintal
Oranges	8.33	49.99	"
Black pulse	404.88	289.20	"

effect by other more powerful factors. (These include increases in the prices of Indian manufactured goods, particularly at the time of the fuel crisis in early 1974, the devaluation of the Nepalese rupee in December 1967, and the complex relationship between rice prices on either side of the border which tends to result in the export of rice south to India (illegally) rather than to the hills);

2) there were some definite reductions in prices in some goods in the hills (exports of the hills (black pulse and ghee) became cheaper both in Bhairahawa as well as Pokhara, but particularly the latter, as a result of improved accessibility within the hills);

3) many unexplained anomalies exist within the Bhairahawa-Pokhara price differential which point to explanations other than the simple one which maintains that the price in Pokhara should reflect the price in Butwal or Bhairahawa plus transport and storage charges.

Extensive data on monthly prices of sixteen commodities for twenty localities collected by the Project throw some additional light on the effect of roads upon prices. The transportation of imports into the hills requires that there is a 'break of bulk' where consignments are broken down into loads for porters who then transport the goods to merchants' stores in off-road hill towns. Goods change hands frequently and a mark-up of between 10 and 15% at each transaction is usual. It appears that traders expect a 'mark-up' of around this figure on total costs, inclusive of transport, since a return of 10-15% on outgoings was widespread, whether the trading establishments were located on or off the roads and despite strong competitive forces. This element of price-following on the part of merchants is apparent, in spite of the fact that any two merchants may have very different turnovers and differential access to sources of supply further up the wholesale/retail chain. The

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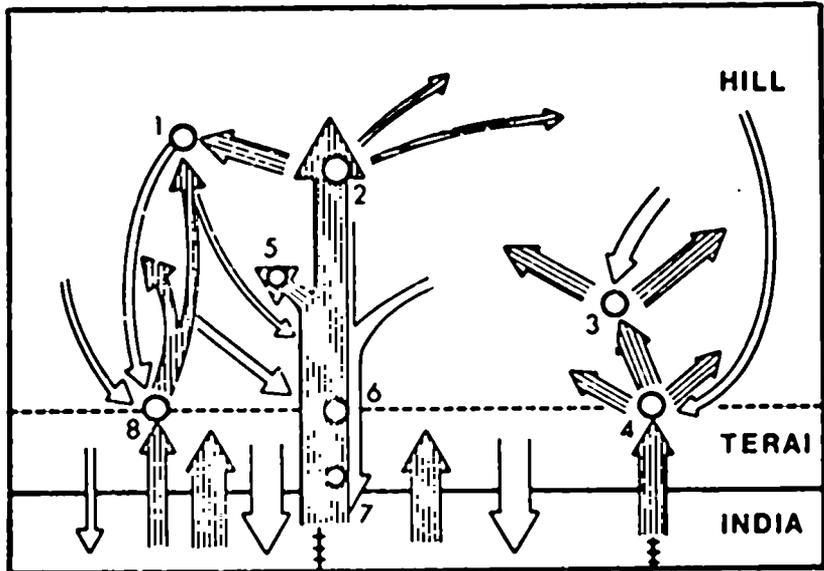
reductions in transport costs that did occur after road provision were largely absorbed by extra 'mark-ups' at break of bulk locations and at other points in the distribution chain, and thus the net effect upon consumer prices, particularly in off-road locations, only showed a momentary halt in the general upward trend of imported Indian price rises.

Since relative real prices of imports into the hills did not decline dramatically, the net handling of imported traded goods per rural family did not materially increase after road provision. The cash disposable income in the region is currently calculated as less than Rs.2000 per household, or less than £15 per capita per year and is declining. Hence the base on which any increase in merchandising might grow (resulting from per capita demand increases) is very small.

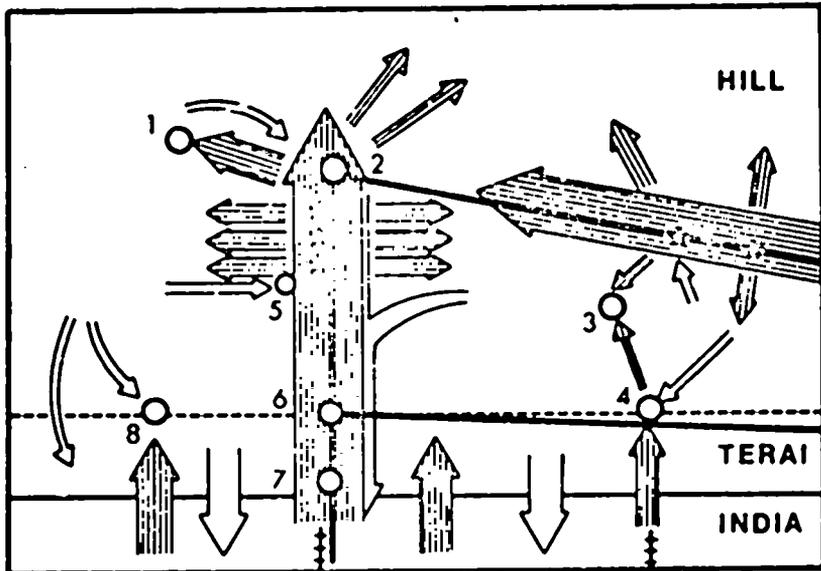
Another factor responsible for the slight effect of roads upon import demand is that many rural families still use long-distance portage (either their own or hired) to export their produce and buy imports in off-road locations. As an approximate guide, most families in the districts of Argha Kanohi, western and southern Gulmi, southern Palpa and southern Tanahun still tend to use the old trails to the terai rather than to buy imported goods at entrepots on the road in the hills. In these cases (perhaps 20% of the population of the hills), any price reduction due to road provision in the hills is not relevant. Figure 4.V indicates the relocations effect and shows that much of the hill region is still served by foot traffic. The demand for imported goods (and implied new opportunities for merchants) has thus not greatly increased as a result of road provision; other developments, however, have changed both the size and nature of demand for imported goods both in the terai and the hills in the last

Fig. 4.v

Change of trade flows after road provision



BEFORE ROADS



AFTER ROADS

- | | |
|---------------|--------------|
| 1 Baglung | 5 Tansen |
| 2 Pokhara | 6 Butwal |
| 3 Bandipur | 7 Blairahawa |
| 4 Narayangarh | 8 Patherkot |

← Hill Exports ← Hill Imports
 ☆ New on-road commercial centres

five years. These medium-term changes result predominantly from the expansion of the administration and its decentralisation. New opportunities for merchants do not arise from a simple price effect but have largely depended upon the creation of relatively large pools of effective demand for imports derived from wages and salaries in the administration. In contrast, the spatially and socially dispersed production of commodities for export in the hills is unsuited to further opportunities for merchant control and consequent accumulation with road provision, as the present 'high value/low bulk' commodities minimise the impact of transportation cost reductions, and any introduction of commodities for export with different characteristics is likely to be extremely slow and restricted in extent, for the reasons outlined in Chapter 3.

Two ethnic groups, the Thakalis and Newars, appear to dominate commerce before and after road provision out of all proportion to their total numbers in the region as a whole, and owe their position in large part to strong respective social cohesion enabling dispersed business networks to be maintained. A third group, possessing Indian nationality, owe their importance to the existence of their own connections with manufacturers and access to both formal and informal markets in rice and 'fancy goods' (luxury commodities imported into Nepal from such countries as Japan and re-exported illegally into India, such as watches, terylene fibres, sunglasses, anoraks, electrical household goods, etc.) in India, but are not characterised by any particular degree of internal cohesion and mutual co-operation. The virtual absence of certain groups from trading includes those who have traditionally been denied access to many activities on caste grounds (Kami, Sarki, Domai). It is disadvantaged groups such as these which do not have:-

- a) access to credit, or to starting capital from other sources;
- b) business connections to arrange sales of produce or the importation of goods and their safe transit;
- c) links with the bureaucracy at the middle and higher levels for licences and contracts.

The larger the enterprise (in terms of turnover) the more the lack of access is critical. Rice stock shops, wholesale cloth shops as well as industrial enterprises like rice and oil mills, factories, printing presses and motorised transport, all require access to these three essential resources, and it is those who were already established who still dominate these spheres after road provision. Relocation of commercial activity towards new centres by these privileged groups within the hills is mainly due to the fact that it became economical to move commercial activity nearer to the points of consumption and production in the hills. Provided that portage costs per tonne/km are far higher than trucking costs (and are perceived as such by the public) then a relocation of a shop on a motorable road where foot travel distance is minimal nearer the points of consumption (for imported goods) or production (for exported goods) will maximize customer potential. There are many examples where the extension of the road network is perceived by shopkeepers at a present break of bulk location to be a threat to their present location's ability to attract custom and a 'disturbance' in the prevailing commercial environment.

This 'disturbance' to the established merchanting structure, however, has afforded a few new entrants into distribution an opportunity to compete successfully in certain niches. While Newars and Thakalis maintain their dominance overall, the retailing end of most types of marketing demands less in the way of starting finance,

business networks and access to well-placed persons within the bureaucracy. Relations between manufacturer, wholesaler, retailer and the State have changed, however, not only as a result of road provision, but also through explicit State action. It is the large merchants with access to the officials in the bureaucracy who are able to negotiate themselves positions of licenced oligopoly to the detriment of other traders and possibly consumers and producers as well. Even in situations where the State has attempted to control prices for all transactions (e.g. bus fares, sugar, kerosene, diesel), it is the more powerful businessmen who can bring their political power to bear within the official spheres and offer the kind of inducements to officials which will enable the State's attempts at regulation to be turned to their advantage. It might be expected that merchants would attempt to forge backward linkages into developing production, but it is very rare indeed for merchants to do so. As Chapter 3 emphasised, rural petty commodity producers are dispersed, atomised and numerous, and, whilst they are therefore unable to organise their own marketing arrangements because of the inability to concentrate sufficient persons in space-time to form the necessary institutions, it is also very difficult for merchants to control producers. The major objectives of the large merchants are therefore to maintain and increase their control over smaller distributors and retailers, by a variety of mechanisms; to ensure overall control of the import trade; to increase the degree of 'horizontal' integration by running several complementary businesses, one of which, increasingly frequently, involves motor transport; to ensure that the producers of imports (Indian factories) do not by-pass them and sell direct to the retailers; and to maintain effective

contacts with local, regional and, if possible, national State officials, the advantages of official recognition and assistance being very considerable.

The number of large merchants and of major commercial enterprises capable of manipulating markets is small, and distribution at the retail end is in the hands of large numbers of 'subsistence' traders and retailers, and even larger numbers of establishments which merely supplement other sources of income to a household (see Table 4.IX).

TABLE 4.IX: Summary of accumulation categories of commercial enterprises

General description	Category of owner's income in Rs. (annual)	Number of observations	% of total observations
Subsistence supplement	0 - 2000	174	51%
Subsistence without accumulation	2001 - 6000	70	20%
Small accumulation	6001 - 25000	51	15%
Large accumulation	25001 - 50000	18	5%
Very large accumulation	50000+	31	9%

Source: Commercial Survey, 1974/75

If we take as an example the trading of cloth, we shall be able to illustrate some of the central features of the commercial structure of the region and its dynamic. Cloth trading in the

pre-road situation had been carried out from a small number of centres (mainly Butwal and Bandipur). Households purchased for their own consumption in large part from these centres to which many travelled once or twice a year to sell exports, collect pensions and purchase other household items. After road provision, there was an increase in the total number of establishments and also in the number of locations of cloth shops. The large increase came particularly at the lower end of the cloth retailing sector (those with gross turnover of under Rs.100,000). The cloth retailing shops have been established not only in on-road locations but also in small bazaars and even villages on the trails in the hills. Many of these shops, especially in villages, bring in revenue which is less than subsistence needs (if it is assumed that Rs.2,000 is a minimum sum for the purchase of all food grains and other needs for the year). The shops at the lower end of the turnover and profits continuum are usually situated in the owner's house and over 75% of all cloth shops employ only family labour. A small clientele of local residents are held by credit and other extra-market ties, since the owner is perceived to be a member of the local community by his clients. Road provision has undoubtedly altered the linkages in the marketing chain. Cloth manufacturers are beginning to deal direct with smaller wholesalers in on-road centres in the hills. Smaller retailers are also tending to deal direct with the larger wholesalers in Bhairahawa. In both cases the traditional pre-road middleman at pre-road break of bulk points, such as Butwal, are out out of the marketing chain. In the reverse order this is also true of ghee marketing where the largest Indian dealers have direct connection with on-road dealers in the hills, and by-pass the old-established ghee-brokers of Butwal.

The monopoly of certain groups of major dealers is thus threatened, although so far they have managed to maintain a strong position. So striking, however, has been the increase in the number of smaller traders and retailers, both in roadside and off-road locations, that any innovation, such as road provision which creates the possibility of an increased volume of sales, appears to result in an expansion in the number of petty trading establishments rather than a price decrease to the consumer.

As a conclusion we suggest that the impact of road provision upon cloth distribution has been to replace merchanting proper with wholesaling and create further marginal retailing opportunities, the first of which may benefit the ultimate producer and consumer and the second mitigate the passing on of the admittedly very small benefits to the consumer but also produce income for a relatively poor group of householders.

To take a brief look at a second example in which roads have had a significant effect upon the structure of distribution (rather than production) of a product, we consider the case of rice and paddy marketing in the terai. (The precise relation of the effects of roads, as opposed to other factors in this concentration, is reported in full in Chapter 6, Vol. III of Part 2, and is briefly summarised here). Road provision has allowed paddy surpluses to be transferred more easily through space and time from points of production to those of consumption. After the construction of the Mahendra Rajmarga, the bulking-up of grain for low cost transportation has tended to concentrate the marketing of grain in Bhairahawa, which has facilitated new institutional arrangements for rice and paddy marketing which in turn accentuate this tendency. In 1975 a joint-stock company formed in the study area with the State owning 51% of

the shares and the rest being offered for sale to the public; the shares, predictably enough, have been purchased by the largest of the rice merchants in the area. This Lumbini Rice and Paddy Export Corporation has on the company board three merchants, three officials and the managing director (a Kathmandu-appointed government official). The three merchant directors are the largest local merchants in rice, as well as in other associated enterprises in which they have interests such as rice and oil milling, motorized transport and warehouses. The company has not extended its activity to direct purchases from farmers or co-operatives (except for a few cases when the farmers bring their produce for sale direct to the company) but purchases from private traders. The merchants share in the large profits the corporation makes in selling to India. The first year involved purchases of about 25,000 metric tonnes of rice almost entirely from the merchants to whom the company paid a little over the local market price and also rent for the use of storage space in the merchants' godowns (storehouses). Unless the power of effective 'public' control in such companies is very much greater than in other State departments and para-Statal organisations, it is clear that the only major results will have been: to exclude the smaller traders from expanding through exporting rice and paddy to India; to enable key members of the bureaucracy to share in the immense profits to be had from exporting rice to India; and to increase the power to accumulate of a few merchants who already are reputed to make net profits of Rs.200,000 per month. The major omission of this arrangement is the complete absence of encouragement to the producer, either by prompt payment when he sells direct to the company, or by any linked means by which the farmer can obtain credit for agricultural

purposes or can purchase new inputs directly.

Given the dependence of Nepal on the grain surplus produced in the terai, the concentration on commercialisation by both private and public sectors to the exclusion of developing production appears shortsighted and perilous. In general, it is perhaps in the sphere of commerce that road provision has had the greatest impact, if we exclude the transport sector itself. But if the building of roads has facilitated the movement of commodities throughout the region, as it undoubtedly has, it remains true that the vast majority of the commodities moving are, with the exception of grain from the terai, imported manufactured goods. Increasing activity in the commercial sphere and reduced transport costs have so far failed to stimulate significant developments in production, either in agriculture or in industry. Changes in the sphere of production have been brought about, by and large, by factors other than road construction - such as population growth, ecological decline, expansion of the local bureaucracy and developments in India.

6. Transport

If there has been a significant increase in the number of commercial enterprises and in commercial activity as a whole throughout the region, the expansion of the motor transport sector, whether in the sphere of haulage or of passenger transport, has been quite remarkable over the past decade, and obviously can be directly attributed to the opportunities provided by road construction.

One of the features of non-agricultural economic enterprise in west-central Nepal is the extent of what might be referred to as

'horizontal integration', in which small numbers of individuals own and control a number of diverse businesses. For example, within the Bhairahawa Chamber of Commerce five individuals owned nineteen businesses between them, while twenty individuals owned fifty enterprises. One man, for instance, has a bus and truck company, a match factory (closed down in 1975), and is a dealer for petrol, kerosene, cigarettes and a range of kirana goods; another man has a rice and oil mill, a large contracting business, rice stock shop, cloth wholesaling business and multiple dealership in a wide range of imported goods. The degree of such 'petty conglomerate' businesses is also considerable among individuals involved in the bus, truck and taxi business. Because quite large starting capital is required for the purchase of a vehicle, it is to be expected that most transport companies are run by those who already have businesses. In many cases the original business involved substantial transport activity and trucks were purchased when roads were constructed to carry the merchant's own goods as well as others'. In some cases loans from banks were obtained (usually between 50% and 100% of the capital cost). Government loans are easier to obtain for enterprises requiring purchase of machinery (e.g. printing presses, factories and motor transport). The dominance of Newars is outstanding and is directly attributable to their experience in other businesses, involving the present owners as well as their fathers. A number of Gurungs have also entered the taxi business, usually employing both their training and savings made whilst in the army and from pensions. Thus, as in commerce, the new opportunities were taken up predominantly by the already advantaged, and particularly by those successful in business and with capital to invest. As in commerce also, entry costs and returns on investment were both higher

initially at the larger scale of the range of operations; later, as competition has grown, the profitability of many branches of the transport sector has declined significantly.

Since the opening of the Siddhartha Rajmarga in April 1968 there has been a spectacular increase in the licensing of motor vehicles in the area.

Dealing with bus transport first, it is apparent that personal travel costs were reduced, both in the hills and the terai, by the provision of roads. Before the opening of the Siddhartha Rajmarga in 1968 a porter carrying a standard load of 35 kgs. took thirteen or fourteen days on a round trip between Pokhara and Butwal. At current prices and assuming similar consumption habits, the porter would spend between 10 and 15 rupees per day on food and drink. A calculation of the net cost of the trip can be obtained - by subtracting the monetary value of fourteen days' meals prepared at home (from data provided by the rural survey), a private daily expenditure of travel on foot at today's prices is estimated at 6 rupees and hence the Pokhara to Butwal trip would have cost 84 rupees, while the current return fare with that load is 62 rupees. It is this monetary saving plus the reduced time and effort which bus travel offered that largely contributed to a marked change in the travel habits in the hills and on the terai, away from commodity transactions and towards 'service' and consumption goals.

In the early years after road construction this buoyant demand for personal travel made investment in buses very attractive, but by late 1970 a situation of heightened competition began to develop and a bus syndicate was formed on the Siddhartha Rajmarga to regulate the number and timing of trips made by individual buses on that route.

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The opening of the Prithivi Rajmarga resulted in some buses leaving the Siddartha Rajmarga syndicate, but saturation was rapidly achieved by a large number of new entries on the new road as well, including mini-buses aimed at richer customers demanding rapid inter-urban transit. The opening of the Mahendra Rajmarga in 1975 caused a further transfer of seventeen buses from the Butwal-Indian border route and four from the Pokhara-Butwal route, and a new syndicate was formed which allows twenty trips a month from Butwal to Narayangarh. However, new entries into the syndicates which provided the buses for the new route immediately took the places of the transferred buses.

Both the Siddartha Rajmarga and Prithivi Rajmarga syndicates try to discourage new entries into their syndicates by limiting the number of buses per company to one, but new companies with more than one bus simply circumvent this rule by forming a separate company for each bus. However, the flow of new entries has declined considerably during the last three years. Returns are declining, partially due to new entries, but also as fares charged are a matter of negotiation between the syndicates and local authorities, their increase has tended to lag behind the spectacular inflation of spare parts and fuel, which are imported from India.

The explanation of the existence of bus syndicates in terms of over-capacity of buses is reported more fully in Vol. III, and can briefly be outlined here. The private benefits from leaving the syndicate and running a bus every day would result in increased use of the large amount of fixed capital hitherto under-utilized within the syndicate, and a better profitability for the individual operator taking his decision (variable costs rising by only 12%, wages only 2% and revenue by about 33%). This action would force other buses to do the same until per trip occupancy rate had dropped by a third to a half and all companies would run at a loss. Another way of syndicate-breaking in the pursuit of increasing private income is to reduce fares unilaterally with the aim of increasing occupancy rate. However, bus travel is very price insensitive since travellers tend to walk to the road and catch the first bus that happens to arrive. Hence it is not privately rational to leave the syndicate and it is likely that 'extra-economic coercion' would occur if any bus owners tried to break the cartel which ensures that all owners make profits.

From a general point of view, a rationalisation of bus services in the region would allow the same service to be provided with about two-thirds the number of buses, hence reducing the capital costs by about a third but with possibilities of fare reductions of only about 10% which implies that the per capita income gains would be very small and not accruing to the very poor. On the other hand there would be a gain in foreign exchange with India (who manufacture buses and trucks under licence from West Germany), since there would be savings on the purchase of spare parts and replacement vehicles. If the employment structure were rationalised the direct loss of employment in the area could be in the order of three hundred and

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fifty (drivers, conductors, managers, cleaners, checkers and clerical workers). But apart from such possibilities of more efficient employment of capital and manpower, the lesson from the personal transport sector is that large amounts of capital were available for investment when the opportunity arose.

Turning now to truck transport, it is clear that a broadly similar development took place. At the opening of the Siddhartha Rajmarga during the period February to May 1968, the total number of truck loads coming into Pokhara along the Siddhartha Rajmarga rose from a daily average of 1.3 to 1.8 and then to 3.6 following the official opening of the road. By November the daily average was 6, while during December and January of 1969 the daily average rose to 7.

In 1973-4 the daily average of trucks arriving in Pokhara along the Siddhartha Rajmarga was just over 9. According to one source, the number of trucks involved in commercial haulage along this route rose from 25 in April 1968 to 35 by December 1969 and then to 60 by December 1970. For the region as a whole the number of trucks appeared to increase from 162 to 239, nearly 50%, in the last five years. The total number of truck arrivals registered in Pokhara on the Siddhartha Rajmarga in 2030 (1973/74) was 3,526 and on the Prithivi Rajmarga 1,421.

Profits from trucking were very high in the early years after the opening of the Siddhartha Rajmarga. Between April 1968 and December 1970 the rate for haulage from Butwal to Pokhara was reduced from Rs.250 per metric tonne to between Rs.120 and Rs.150, and the reason seems to have been increasing competition between trucking companies. The present charge of between Rs.700 and Rs.800 per truck load from Bhairahawa to Pokhara, and Rs.500 from Kathmandu to

Pokhara (Spring 1975) represents a rate of Rs.175 per metric tonne. The present situation of trucking firms is that net annual revenue is equal to about one-third to one-fifth the purchase price of a truck (about Rs.95,000) so that vehicle cost can be repaid in five years or less. This rate of return was roughly equal to that on buses in 1975, an equalisation brought about partially by the perception of a much higher return on passenger transport, leading to trucks being converted into buses around 1970.

The level of profits accruing to public haulage contractors has declined in recent years, although there is very considerable variability between operators. This is partly accounted for by the differing astuteness of the operator and the efficiency of his networks with commission agents and merchants of the owners in securing loads, particularly for the back-haul from Pokhara to Bhairahawa or Kathmandu. A general source of concern for public carriers is the steady increase in private carriers - trucks controlled largely by the wealthier merchants, many of whom are in the process of horizontal integration of businesses. Table 4.X shows the increase of private carriers relative to public carriers in Lumbini Zone.

TABLE 4.X: Numbers of private and public carriers licensed in Lumbini Zone

Year (Nep)	Year (AD)	No. Private carriers	No. Public carriers
2027-28	1971	5	103
2028-29	1972	68	109
2029-30	1973	87	114
2030-31	1974	97	116

Source: Superintendent of Police Office, Bhairahawa

The vast bulk of goods transported by road within the region travels in trucks, originally manufactured in India and generally with a capacity either of five tons or (more rarely) eight tons; however, smaller vehicles such as jeeps and Land Rovers are also used for transporting goods between towns. The number of private jeeps and Land Rovers (and similar small vehicles) registered with the police in Bhairahawa for Lumbini Zone rose between 1971 and 1975 from 113 to 143, an increase of about 25%, and those in Pokhara for Gandhaki Zone from 1 to 13. Some of these smaller motor vehicles are used as taxis within the urban centres, often under conditions of competition with buses. Motor taxis are rare in Bhairahawa and Butwal towns where the predominant mode of intra-city transport is the pedal rickshaw; the same applies to the route between Bhairahawa and the border. The new towns along the Siddhartha Rajmarga and the Prithivi Rajmarga do not have resident motor taxis, the size of those centres and the demand being too small to support a permanent local taxi, but in Pokhara in 1974-5 the number of taxis had reached such proportions that attempts were made to form a syndicate (in the same way as in the case of buses) to regulate the picking up of passengers and to arrange a rotation system to reduce direct competition. The syndicate failed largely due to the fact that "outsider" taxis from Kathmandu, who owed no loyalty to the Pokhara-based syndicate, continued to pick up loads and passengers indiscriminately. The general characteristic of diffuse origins and destinations among taxis is similar to that of trucks, and may well prove problematic in the running of any syndicate which taxi or truck operators may consider as a means of preserving profits in the face of excess capacity in the future. Although accurate data are difficult to come by (meters usually not working even if attached to vehicle, and no written

accounts being kept by drivers or users), it is clear that profit levels have dropped in recent years, and many are "locked into" the taxi business, unable to sell their cars at sufficient prices to repay loans.

It is difficult to assess the effect of the building of roads and of the development of a motor transport sector on those whose livelihood depended largely on non-motorised transport, for little good information is available on the pre-road situation. However, real portage rates per day worked appear to have increased since the provision of the roads, whilst average journey length has decreased; the latter because on-road bulking locations to off-road retailing or consumption points now account for most of porter journeys, rather than from a hill location to a terai trading centre as in the pre-road situation. However, many more routes are used now by paid porters (east-west) compared with a few, with a predominantly north-south orientation, previously. There are therefore more trading centres, since a "turn-pike" behaviour has resulted whereby off-road travel distance is minimized. In this way Tansen, Walling, Syangja and Naudanda on the Siddhartha Rajmarga, and Damauli, Dumre, Bimalnagar, Majua Khairani on the Prithivi Rajmarga have become break of bulk points and have attracted wholesalers and a number of commission agents who arrange transportation. Whilst many traders based in the hills usually supervise the loading, unloading into trucks and the hiring of porters for onward transport of their goods themselves and will not bother with commission agents, others not familiar with the job of hiring reliable porters will employ commission agents. Commission agents generally charge a small commission, although commissions can be very much higher for motorised transport, up to

25% of the rate charged by the trucking firms. Agents organise up to forty trips a month (usually between Bhairahava to Pokhara or Kathmandu). All the cases of transport agents interviewed had either a pre-established shop or wholesaling business (implying horizontal integration within merchanting), or a strongly surplus farm, which provided the starting capital.

A central problem is to provide an explanation of why portage rates per day worked and per tonne/km moved have increased markedly above the rate of inflation (while still being very low). One explanation is that current rates for porters from the break of bulk locations mentioned above represent travelling and waiting time since most porters interviewed have to wait from two to eight days for a load. However, there is no shortage of porters except on feast-days and occasionally during the rainy season (which is busy for agricultural purposes and difficult or impracticable to carry loads). In addition, many merchants bargain with porters over rates, refuse porters the right to weigh their loads (hence give themselves the opportunity to under-estimate the load) and are usually in a position to pick and choose from the unorganised group of porters who await the arrival of trucks. Thus there is no reason why merchants should not be in a position to force the price of portering down. In the pre-road situation, rates for a 'usual load' of about 35 kgs were about a third of the current rates, without allowance for inflation, which has in the last ten years been of the order of fifty per cent (with the maximum price increase being for cloth which amounted to two hundred and fifty per cent). In the pre-road situation, porters arrived at Butwal and Narayangarh or Bandipur and, while it might be hypothesised that waiting time may have been less at these places, the basic relationship was still

between a merchant and an over-abundant supply of porters. Furthermore, there is no reason to suppose that portering to repay debts to shopkeepers was any more prevalent than it is now. The explanation we offer is that merchants do not as a group act in a simple labour-cost-minimisation manner but follow a limited competition "cost-plus" approach to pricing of the retailed product (already discussed above), hence merely marking up on transport costs in the same way as on the cost of goods purchased from the previous segment of the marketing chain. Since there is a good deal of "price following" of other commercial establishments, as well as variations of prices themselves, it is still possible to obtain customers to buy goods, even if the transport element in the retail price in cases of some retailers and wholesalers has not been reduced to the minimum cost of merely feeding the porter during the journey.

The effect of road transport upon mule and donkey transport followed a similar pattern. The opening of the Siddartha Rajmarga immediately replaced mules, which transferred to other routes, particularly Pokhara to Jomsom and some of the other lateral routes to the same break of bulk points which porters now use. However, mule trips are limited by the quality of the track all the year and also by the monsoon which causes deterioration of those routes which in the dry season can be used by mules. Rates charged per tonne/km are usually identical with those charges by porters. However, mules tend to transport for larger merchants who wish a large consignment of goods to be taken long distances and on contract to the government for the transport of foodstuffs, building materials and sometimes equipment for the administration of police and army in remote areas. Profitability of mule transport varies very considerably

between routes, but as a general rule the owner's income per animal per year varies from Rs.700 on the less-used routes to Rs.1000 on the Pokhara-Jomsom trail. However, there tends to be a maximum number of mules (about nine) which one owner may work since he must load and unload his mules every day on the trail. Payment of others to take the mules along the trail is avoided since adequate treatment of the mules can only satisfactorily be provided by the owner himself. Most of the mule owners on the Pokhara-Jomsom trail are from the small villages in the south of Mustang and are continually operating mule trains in the dry months from November through to the beginning of June. Their incomes are supplemented by varying amounts of produce from their lands which are tended mostly by the women of the household. There has not been an increase in mule ownership, nor any attempt by other groups to move into mule transport, in spite of moderate, but reliable profits of up to about Rs.8000 per annum, for the reasons that new competitors would not have the same advantage as the Marphali muleteers (which is the ability to combine mule-driving with farming in areas of good availability of abundant summer high pastures, where mules benefit from the low summer rainfall of these trans-Himalayan regions). While other groups have tended not to move into mule-driving because of the particular access qualifications required, Marphalis in contrast have moved into trucking.

Bullock carts are common in the terai and are also found in the Pokhara valley since 1953 when the first one was flown in (Hagen, 1959). The effect of road provision on bullock cart usage in the study area is well summed up by a report by the ECAFE Transport and Communications Committee (1969), which stated that:-

"It was once thought that the use of antiquated carts which had survived centuries of changes might not continue long in the era of motor transport. This expectation has not materialised because motor lorries can operate successfully only around industrial areas. Due to insufficient loads, time taken in loading and unloading, long waiting at the market or the time spent looking for a return load at the market, the cost is so high that motor transport cannot as yet compete with the bullock cart. For conditions existing in the developing countries, the animal-drawn vehicle is cheap for short hauls. For medium hauls, trucks are more suitable ..."

In line with this statement, the general situation with regard to bullock carts in the terai and the Pokhara valley is that their use has remained either at a constant level (hauling small consignments small distances of up to 20 kms, to local markets or haat bazaars) or has increased where carts are carrying goods on contract to the government (particularly the National Trading Corporation, the Salt Trading Corporation and the Agricultural Development Bank). Since the services of cart and bullocks are intimately tied to the farm itself, the hiring out of a cart and bullocks on contract is an ideal means of earning supplementary income for farmers.

Traditional modes of transport have, it would appear, suffered less as a result of the development of alternative modes of transport based on the new roads than might have been expected. Here, once again, the impact of road provision has been extremely limited.

5. Summary

The building of three main roads in West-Central Nepal over the last ten years has had very little effect on the crucial prerequisites for any significant development of the region, namely increasing productivity in agriculture and industry. There have however been some changes in commerce and trade, in part attributable to the roads, but in part to the growth of population and the bureaucracy. No evidence has been found to support the optimistic prognosis of the effect of roads in the fourth Nepalese Five Year Plan that "the building of roads linking different, and unequal, regions should have the effect of reducing inequalities between those regions, and also, through the more general and social economic impact of road provision, between different sections of the population within each region". Why this has not occurred requires explanation. Such an explanation is only possible if the analysis transcends the limited appraisal of roads per se, and considers the total context within which roads are planned, built and used. Only by making use of a framework which explicitly incorporates "economic", "political" and "social" factors within an integrated dynamic system can an adequate understanding be achieved, and an appropriate policy devised.

Nepal today is a country in crisis; a crisis brought about by rapid population growth, and the inability of either the State or private enterprise to respond adequately to increase production and generate accumulation for further productive investment. The fundamental continuity in the structure and organisation of the Nepalese State over the last two hundred years explains in large part its inability to intervene effectively in the production process

and its heavy reliance today on foreign aid. Nepal constitutes a peripheral but important market for commodities produced on a mass scale in India, and thus Indian industrialists and businessmen exert considerable pressure on their government to ensure that political boundaries do not provide real tariff barriers to the export of Indian manufactures. In so far as it represents such business interests, the Indian government is concerned to maintain and even extend such trade and transit treaties as exist, all of which favour Indian producers and merchants at Nepal's expense and contribute very largely to the stunted development of Nepalese industry. These interests are largely coincident with the Indian government's concern to prevent a major collapse on their vulnerable northern frontier, by means of support through aid and recruitment of Nepalese Gurkhas into the Indian army, and by means which allow it influence and control over internal and external policy in Nepal.

The present rate of population growth threatens to bring about the collapse of the hill economy (where 59% of the population live) within fifteen years through land fragmentation, declining yields, forest degradation, erosion and subsequent loss of arable land. Already the hills are a food grain deficit area and largely dependent on foodstuffs bought with cash, derived from remittances sent back by those employed abroad. New responses in terms of intercropping, the introduction of wheat into rice lands in winter and minor improvements in irrigation and field levelling have taken place, but have not kept pace with population growth. The plains (the terai) still constitute a food grain surplus area, but will be increasingly subject to pressure of population as immigration from the hills and India increases. It has been argued by some that population pressure can act as a stimulus

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to technical innovation and development in agriculture, but even in the terai, where resources, transport and labour are more readily available, the extent to which 'modern' capitalist agriculture has developed remains limited, although it is here that the hopes of increasing production must lie, and indeed the present but diminishing grain surplus of the terai is one of the two crucial supports of the Nepalese State; the other being foreign aid which at present largely serves to postpone rather than resolve the crisis.

However the inability of either government or private enterprises to increase production and avert the crisis must throw doubt upon the efficacy of either road provision by itself or supported by complementary investments (e.g. rural development projects). This implies the need for a powerful commitment at all levels to carry through the urgent and far-reaching measures required. Only under these conditions would roads assume the crucial role so frequently expected of them.

APPENDIX

Preliminary Report on Roads and Agricultural Change in West Central Planning Region of Nepal

Part I: The General Situation

"Nepal is poor and is daily becoming poorer". This is the opening sentence of a recently published UN Report.* It is the most concise statement of the problem facing the 94% of Nepal's population who live in the rural areas and who depend mainly on agriculture for their economic livelihood. Political changes during the last twenty-five years have opened Nepal's economy and polity to the outside world. There has also been an economic transformation over the last fifty years from a situation of simple autarchy with available resources and technology adequate to maintain a stable subsistence in spite of an extractive tributary political order, to a situation where a combination of population pressure, ecological decline, adverse economic conditions and inept government intervention threatens a total economic collapse within ten years. Such a collapse would be reflected by increasing deprivations, including famine for the widest sections of the rural population, as well as a breakdown of urban and administrative institutions.

Within this overall situation there is a very strong regional variation both in terms of current conditions and future possibilities. Because of this the main part of this report is separated

*The Challenge of Nepal, ARTEP/ILO, Bangkok, 1974.

into two. The first deals with the Hills and the second with the Terai. The Hills, which support 60% of the rural population with 30% of the cultivatable land, face the greatest risk of collapse as its ecosystem is under greatest pressure. The regional variations can be identified in terms of accessibility, climate, geomorphology, product mix, population pressure, migration, etc. The climax of these differences is that the Terai continues to be a food surplus region that needs to draw on seasonal and permanent migrant labour to realise its potential. The Hills have a substantial food deficit and much of its population has to find outside employment to maintain an economic livelihood.

A road system that connects two such dissimilar regions could conceivably have a major effect in adjustment, through encouraging specialisation and exchange by comparative advantage. Both the fourth and fifth Five Year Plans have argued for improved north-south communications as a way of dealing with the regional income differences. There has to date been very little regional adjustment as a result of the road building programme. Two major factors can be identified as preventing such an adjustment. The first is the inflexibility of hill agricultural systems in re-allocating resource to commercial production. This is described in the next section. The implication is that in spite of the roads, the Hills have not yet developed a commercial surplus of temperate agricultural and horticultural products. The other is that the market demand for the Terai surplus from India is far greater than any demand from the Hills. Thus, in spite of increasing deficits in the Hills, most of the Terai produce continues to move south because the purchasing power of the Hills cannot effectively compete with the market pull from India. Diversion of surplus to the Hills in

the future either requires the massive use of government funds or a closing of the border with India with an effective policing of legal and illegal trade movements. Both of these alternatives are infeasible given the ineffectiveness of Nepal's administration and its complete dependence on India for essential imports.

The pre-conditions that would allow a favourable regional re-adjustment in agricultural production to take place as a result of improved road communications do not therefore exist. This is already demonstrated in the empty backhauls of most trucks bringing goods into the Hills from the south. To a large extent the roads are speeding up the processes leading to regional inequality and not counteracting them. This is unavoidable unless some way is found to increase the purchasing power of the Hill rural population. The next section sets out some of the difficulties in doing this.

The Provision of Roads and the Problems of Hill Agriculture

It has been conventionally assumed that the provision of roads should make a substantial contribution to agricultural development. The extent to which such development takes place, however, is dependent on the capacities of agricultural systems to expand and re-allocate resources. Roads have not made a substantial contribution to agriculture in the Hill Districts of the west-central Planning Region because they do not touch on the central problems of agrarian economy of the area.

The core of these problems is located in the relationship between increasing population pressure and ecological decline.

For the last thirty years most of the Hill Districts have been approaching and have now passed the critical point where further pressure on agricultural resources is leading to ecological decline given current technologies. Currently the density of rural population to arable land in the hills of Nepal is the highest in South Asia, being 25% greater than that of Bangladesh. Cultivation is cutting into steeper forest lands where the risks of soil loss are greatest. The nutrient status of the soil is reduced by constant cultivation and insufficient use of manures and fertilisers. Forest resources are rapidly diminished by the increasing demands of human and animal population for wood and fodder. There is, as a result, a declining agricultural resource base. Yields are falling, which, combined with a substantial growth in population, means that per capita agricultural production is falling even more rapidly. The decline in food production is especially noticeable in the more inaccessible areas where severe food shortages are becoming greater and more frequent in time and space. Commercial output is falling even more rapidly than food. Cotton and oil seeds have practically ceased as cash crops. The major citrus production and exports from the Pokhara area have also gone. This is mainly due to a failure to check a micro-plasma greening disease. Ghee sales have dropped as cattle numbers have fallen because of the increased difficulty of getting forage.

Parallel to and accentuating these "farm" problems are other difficulties. First there has been very limited expansion of non-farm employment to provide alternative income sources. The only significant expanding sector has been the growth of local and district administration and that tends to benefit outsiders rather than local farm families. There has been no growth in non-agricultural production. The growth of jobs in new commercial activities and tourism,

the only other expanding sectors, has only been a small fraction of the growth of the rural labour force. There are two other "leakage channels" for excess hill agricultural population, but both of these have a declining capacity. One is migration to the Terai. Current survey shows that there are approximately 350,000 hac. of cultivatable land left to be exploited in the Terai. This is enough land to settle approximately 933,000 people or 156,000 families. If all of this was to be made available to Hill people it would account for approximately three years' population growth only.

Much of the new land is, however, also being settled by landless residents of the Terai and by migrants moving north from India. Overseas service, especially in the British and Indian armies, has made a major contribution to Hill incomes. The British army is reducing the recruitment of Nepali "Gurkhas". Other work opportunities in India also appear to be declining. Thus alternative income sources are closing off at the same time that the Hill agricultural economy is increasingly unable to deal with the increasing population. The problem is still further confounded by a poor communications system and an ineffectual administration. The possible improvements to be expected from building two trunk roads in this situation are very small.

The Opportunities and Road Provision

On an a priori basis it might be argued that roads provide the opportunities for increasing agricultural incomes. Previously isolated mountainous areas can have greater access to more distant markets. There are possibilities for expanded rural-urban inter-

regional and international trade, increasing the demand for those products which the Hills have comparative advantage in producing. Improved communication could encourage urbanisation and non-agricultural production which in turn make further demands on agricultural production. Roads might be a major factor determining the adoption of new technologies, particularly transport-intensive ones such as chemical fertilisers, but also those that require mainly the communication of ideas. Roads can encourage specialisation and commercialisation in agriculture. It becomes easier to buy and sell farm inputs and outputs. Farmers are more encouraged to shift from subsistence to commercial agricultural systems if their food supplies can be assured through the market, which in turn depends on improved communication. Public services are made available through the road system. The operation of agricultural administration, including extension and research, is dependent on roads both for maintaining personnel and for distributing services. There are a number of opportunities, such as the introduction of new cash crops like tea and pyrethrum, the development of new methods of forest and pasture control and the use of new inputs, where public services of research extension, the provision of processing, marketing and credit facilities must accompany any farm change.

It is a simple matter to show a priori how these opportunities and factors require a good communication system to be effective. They have, however, had little effect on the Hill regions of Nepal. The roads have served to encourage agricultural imports rather than exports. The adoption of new technologies has been very limited. No new crops have appeared. The move towards increasing subsistence because of population pressure outweighs any local commercial

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development, and public administrative services have been limited and ineffective. The roads as they stand may be a necessary, but are clearly not a sufficient, condition for agricultural development in the Hills. The limited or negative responses are partly because roads per se do not touch the central problem of the Hill agricultural economy outlined above, partly because of the limited nature of the road system, partly because of the inadequacies of government and aid programmes and partly because of the nature of indigenous farm responses.

Building highways will not necessarily open up an area to agricultural development if a) its command area has limited cultivated potentiality, and b) secondary and tertiary complementary investments are not provided. The first problem is one of the engineering design of the alignment of the road, which is critical in the mountainous terrain that typifies the hills of Nepal. If engineering costs are the prime consideration then the road, by following watershed alignments, passing through areas of low agricultural potentiality and using narrow valleys, may not be optimal for agricultural development. There is substantial evidence that this has happened on the Pokhara-Kathmandu road where major cultivated areas of Lamjung and Gorkha are not benefiting from the road. The second problem is concerned with investments in low cost feeder roads, mule tracks, porter trails, bridges, markets and institutional support for co-operatives, agricultural research, extension and credit services, etc. The paucity of such investments has restricted productivity increases even in those areas, such as Pokhara Valley and along the alignment of the Pokhara-Bhairahawa road in Syangja and Palpa Districts. There is little linkage between agricultural and transport plans.

In the fourth Five Year Plan the transportation sector identifies four growth axes along the north-south corridor as stimuli to regional development. The agricultural sector of the plan does not even acknowledge their existence. Feeder roads are conspicuously absent from current road expansion programmes.

The failure of complementary investments have restricted the potential benefits of the roads to a very limited range of marginal technical changes which can be adapted by farmers with little institutional assistance, and to those limited areas of valley lands through which the road passes. Within these limitations farmers' responses have not been extensive. Thus the preliminary findings of the farm surveys show a maximum of 10% of those farmers using available new inputs such as improved seeds and fertilisers in the very limited areas where these are useful and available (i.e. cultivatable level land within three to four hours walking distance from the road). These limited responses suggest a number of interesting hypotheses that will be followed up in later analysis.

There is also a general issue of inadequate indigenous response to changing conditions and opportunities facing Hill farmers. The rapid build-up of population pressure has led to some agronomic adjustment but not enough to keep pace with demand. Thus there has been a greater degree of multi-cropping, particularly the expansion of a winter wheat on paddy lands, and an extension of cultivation into marginal areas. Both of these can lead to long-run deterioration of production potential, because there has been no advance in conserving and utilising waste products to arrest the declining nutrient status of the soil, and no change in cultivation techniques to arrest the negative impact on soil structure of multi-cropping. Water control is extremely primitive and is not changing

although it is critical in determining yields of paddy and irrigated winter crops. There are missed opportunities for further intensification. Thus plant populations are uncontrolled for many crops that are still sown by broadcasting on tiny fields which could be simply line planted. In the Hills of Nepal there is also a process of involution, but it is leading to a declining economy.

There are some exceptions to this rather dismal picture. In the valley areas served by the road there has been a significant expansion in the growth of winter wheat on previously seasonally unused paddy lands. Roads have been needed for this because of the need for new seeds, fertiliser and advice. In one location, Walling in Syangja District, there has been an expansion of commercial sugar cane production for the local market. This has involved allocating paddy lands to sugar and has only been possible because the road has assured the easy import of food grains from the Terai. Thus farmers in Walling can now buy twice as much rice with the money earned from sugar as compared to what they grew previously on the land now used for sugar. There is some, but not conclusive, evidence of an expansion of ginger production that may be partly due to the reduction in marketing costs provided by the road. The difficulty of assessing this is that prices are currently high and production has been reported as high before the roads were built, when international prices were also high. The road has allowed a greater export of fresh as opposed to dry ginger, however, and may well have arrested a decline in ginger production caused by the increasing inaccessibility of firewood needed for ginger drying.

New opportunities that have been missed are, however, far more noticeable than those taken up. There has been considerable growth of urbanisation parallel with, and in some cases as a consequence of,

the building of the roads. Most noticeable is the expansion of Pokhara and the development of new centres at Walling, Syangja, Damanli, Dumre and Majuva Kaireni. The new concentrations of population and the catering demands from increased travelling have led to substantial new demands for eggs, milk, fresh meat and vegetables. Most of this demand, except for milk, has been met from imports from India and the Terai, and most of the increase in milk demand has been met by increasing adulteration. The limited capacity for Hill agriculture to develop is most dramatically illustrated by this failure to meet new urban demands. There are structural problems such as the difficulty of irrigating terraced lands in winter when the rivers are deeply incised one to two hundred metres below; the difficulty of getting access to good seed; the high costs of animal feedstuffs and the limited supplies of locally-grown fodder; and the virtual non-existence of administrative assistance. There is, however, an underlying inflexibility in local agriculture systems which effectively discourages any re-allocation of resources from conventional practices. Then any attempt to meet new demands can only be done by making additional demands on resources of which no further supplies are available.

Another missed opportunity is the failure to develop a horticultural industry. The comparative advantages of the Hills in producing horticultural products has been recognised in a number of plans. The official long-term agricultural strategy calls for a specialisation in grain production in the Terai, horticulture in the Hills and animal production in the higher Himalayan areas. Road provision should only encourage the expansion of fruit production by making large-scale sales possible. It has been carried out for centuries on a local basis so the knowledge and skills are

available. There is no sign of expansion. The total volume of fruit produced and sold has, in fact, fallen since the first road was built connecting Pokhara to India. This is due to the spread of greening disease for which treatment is known but not made available. The result of the road has been the importation of fruit to meet urban demands of the Hills and not the expansion of local production.

Conditions in the Hills appear to favour the growth of a number of valuable commercial crops, particularly tea, pyrethrum and spices such as cardamom. The value of such crops would far outweigh the value of grain which land is currently occupied with and their production, if feasible, could transform the Hill economy. Very little has been done in the region to test these crops. If they were to be introduced considerable investments would be necessary in processing and marketing facilities. Such investments appear outside the capacity of Nepali institutions.

Some of the reasons for non-response to new opportunities provided by improved communications have been given. Dominating them are two. First is the tightness of resource use under current technology of the Hill farming systems. There is little slack in terms of land, animal-power, local manure and even labour at peak periods which can be utilised to introduce new production. Innovations compete for the same resources as those utilised by low productivity subsistence food production. Farmers who are close to subsistence output levels, as the majority are, find it difficult to risk jeopardising current food supplies by trying risky commercial crops. This means that the start of development towards commercial specialisation must be paralleled by intensification in food production in order to release resources towards the more profitable

enterprises. Such intensification is only possible by increasing the on-farm use of such non-farm inputs as improved seeds, chemical fertilizers and insecticides. The purchase of these inputs is in turn possible if more of the output is sold on the market. Thus there is the vicious circle as population pressure makes it increasingly more difficult to sell crops, therefore farmers cannot introduce commercial production.

The second dominating factor is the inability of the agricultural administration to meet farmers' needs. The limited number of feasible improvements available reflects the neglect of any agricultural research programme for the Hills of the region. The slow spread of these limited improvements reflects the inability of the extension service to help farmers adopt them. New commercial opportunities are only feasible with substantial government inputs involving skilled technical and administrative personnel. These have not been made available to the region.

The scope for private action is therefore limited to adapting known improvements that do not require processing facilities beyond the capacities of the individual farmer in order to market the products. Public action appears impossible without a fundamental change in administrative ethics, objectives and efficiency. It would be Utopian to argue that this is possible without a complete change in Nepal's politics. The failure of the Hills under current conditions towards increasing poverty will be reflected in increasing intensity and frequency of food shortages. The function of the roads is then reduced to the distribution of famine relief. Within ten years the grain surplus in the Terai will be less than the deficit of the Hills. Nepal will change from being a net food exporter to a major food importer. There is no sign of any export activity that

can develop to pay for this. The long-term consequences of the impoverished Hill agriculture not only affect Hill farmers but also the total Nepali economy. Under these conditions the building and maintenance of expensive roads becomes an irrelevant luxury.

The Terai and the Development of an Agricultural Surplus

The qualitative differences in agricultural production between the Hills and the Terai is reflected in the role of each in relation to Nepal's economy. Agriculture is important in the Hills because it is the main source of livelihood for the population with few other opportunities. Its role in economic change in Nepal has been passive in the past and is negative at present. Agricultural production in the Terai, however, continues to be the dominant production sector of the Nepalese economy. It is the only base for even minimal viability and its sustained growth is essential to maintain the Nepalese State. There are four critical areas which identify its importance in Nepal's economy. First, it is the only source of food supplies that are essential to maintain the urban centres, the exploding bureaucracy, the State forces of the army and police, and also the extreme food deficit areas of the Hills. Without these food supplies the State administrative and security apparatus could not function and mass famine would be normal. Second, it is the major source of foreign exchange earnings which are in turn essential to maintain a country wholly dependent on imported manufactured goods. Third, it is a major source of government revenue through the collection of land taxes, forced loans, excise and export levies. Unlike in the Hills, the cost of administration in the Terai is considerably less than the funds collected.

Finally, the Terai has, up until now, been able to absorb labour from the over-populated Hills where the pressure on cultivatable land is three times as great. This ability has been important to release both the political and economic pressures which threaten most of Nepal, but is a declining facility. Unused cultivatable land is sufficient for only three years' population increase. These functions have been critical in determining the economic viability of Nepal's economy. Changes in the Terai's agriculture are therefore critical in determining the future direction of the country.

There is no obvious way of locating the central problematic of the project's research: the socio-economic effects of road provision in the issues related to the Terai's development. Communications have been, and continue to be, important in influencing the growth and distribution of the Terai's surplus. It is difficult, however, to identify the major historical changes, such as the colonisation of the forest lands, the introduction of paddy transplanting, the expansion of winter wheat, the use of chemical fertilisers and, most recently, the spread of mechanisation for cultivation and for irrigation, with road development within Nepal. The communications that have been more important as incentives to development have been those that open out the Indian market to the Terai's production. The Terai's agricultural economy, therefore, contrasts with that of the Hills. In the Hills little development has taken place as a result of road provision. In the Terai considerable development has taken place without road provision. The latter generalisation needs some slight modification especially where the newly-built roads are opening up forest lands for further agricultural expansion. The role of the new roads

becomes more important in affecting the realization and the distribution of the Terai's agricultural surplus than in its production. To understand these contrasts it is necessary briefly to sketch the major historical factors determining the Terai's development in order to locate and put into perspective the scale of road impact. The current opportunities which might be influenced by road provision and current limitations on expansion are also described to predict possible future impacts. Finally, the role of the road in linking the Terai's development with that of the rest of Nepal is set out.

The role of the Terai as a source of food and finance to maintain the Nepalese State is not a recent one. Descriptions made at the beginning of the nineteenth century appear very similar to those made today. The major difference is that the demands of the State have expanded enormously over the last one hundred and fifty years. The Terai's surplus has also expanded.

The main factor explaining the expansion of agricultural production in the Terai has been the expansion of the cultivated area through settlement rather than through intensification of production or the application of technological innovation. To some extent there is still an agricultural frontier in the Terai but unused cultivatable forest lands are rapidly disappearing. Migration from the heavily-populated areas both to the north and south (India) of the Terai, and settlement there, is not just a recent phenomenon, however.

In 1820, after the Prithvi Narayan Shah and his successors had conquered Nepal and the adjoining Himalayan areas, thus effectively controlling all access trade routes between India and Tibet, an English official was prompted to remark that without the Terai ... "the Nepalese could never have risen to the greatness which they

have attained ..." (M.C. Regmi, 1971, 16). Another Briton, Henry Velleseley, who visited Nepal between 1809 and 1819, wrote then that what are today Rupendehi and Kapilavastu Districts were "... as nearly well cultivated as Bihar or Benares..."

After the Anglo-Nepalese War (1814-1816), however, Bhimsen Thapa decided to de-populate the southern border of Nepal by forced transportation of its inhabitants to other areas and allowed the area to return to its natural malaria-infested jungle state so as to act as a protective buffer between Nepal and the northern frontier of India. This policy was discontinued during the Rana rule (1847-1951). The Ranas tried to encourage emigration to the Terai and the Inner Terai by means of land grants. These grants were distributed to government employees, members of the nobility and to other persons in favour. In 1910, when Chandra Shamsheer was in power, the government established settlement offices in Biratnagar (Eastern Terai) and Hetauda (Central Inner Terai) for new migrants. But even "the offer of limitless land" (Elder, 1974, 8) failed to induce the hill people to settle there, so great was their fear of endemic malaria.

In 1956 malaria was eradicated in the Bapiti Valley in the Chitwan District with the combined help of USAID and WHO. At the same time an all-weather motorable road was built between Hetauda and Maryangarth. A large number of migrants from the hill districts of Kaski, Syangja, Palpa, Lamjung, most of them ex-servicemen, came and settled in this area.

In 1962, with the aid of Israeli experts, sizeable tracts of available forest land suitable for converting into farmland were marked out by the government in several areas in Eastern and Western Terai and in Nawalpur in the Inner Terai, and a malaria eradication

programme was put into operation. The Nepal Punarvas (Resettlement) Company was established in 1963 and the first project was launched in Nawalpur (Nawal-Parasi) District and modelled on the Moshav-type of settlement in Israel. By 1973, 1,435 families had been re-settled there. Of these families, 785 came from the Hill region in our study area and 109 from the Terali. A further 207 families have also been settled at Dhanewa in the Lumbini Zone.

A landless farmer is allotted a total of 2.6 hectares. He does not have to repay the price of the land until ten years later when he will secure government ownership of it by official registration. An intensive agricultural extension service and a co-operative for financing loans has been provided by the company. Provision is also made for the formation of services such as schools, health posts and family planning facilities.

The number of applications for new land largely exceeds the available supplies of the project, as it has drawn a large number of landless families into the area, who have settled nearby in the expectation of one day being absorbed into the scheme.

Many prospective settlers who were not accepted into the Punarvas and could not afford to buy land, decided to clear and cultivate the jungle (the foothills and along the river banks). In spite of official threats, fines, imprisonment and continuing harassment by the forest guards, the police and the respective Panchayats, these unauthorized settlers succeeded in building new homes, opening up new tracts of farlands and establishing a new pattern of life. In many areas the squatters have not been integrated into the official political structure of the Panchayats and come into conflict with the original inhabitants. The majority of land cleared illegally has not yet been recorded by the Land

Registration Office, despite repeated requests from the immigrants. The squatters generally farm less than two hectares of land per family but consider themselves to be better off than before.

At the end of the 'sixties, the malaria eradication campaign was successfully completed. This and the construction of the British-built road between Butwal and Gaidakot has attracted increasingly large numbers of landless people into the area in search of land. The building of the road from 1969 until 1975 has necessitated the opening up of large areas of jungle and has permitted a quick and relatively easy colonisation of land close to the road. Many of the migrants found employment in the construction of the road and chose a suitable plot of land close to the road on which to settle. Some of their womenfolk opened up small roadside shops where the sale of a few basic commodities, or food and drink, to the road workers and local inhabitants brought in enough money with the wages of the menfolk to support their families. Many women supported their families in this way during the first difficult years while their men were clearing the forest and planting the land until the first good harvests were reaped. The study of the Mahendra Rajmarga afforded an opportunity to examine the chronological train of events from the clearance of the jungle to the establishment of new villages and new weekly markets.

During the last twenty years the major factor which has permitted the opening up of new settlement areas in the Terai and Inner Terai has been the eradication of malaria. In Nawalpur the creation of the re-settlement scheme sponsored by the Nepal Punarvas Company has had a determinant effect. A certain number of landless people were able to obtain new land, free seeds and ready credit

with the possibility of gradually buying their plots of land after a ten-year period. After this time they have the right to sell, subdivide or mortgage their land.

During the last six years, since work began on the East-West Highway, the majority of poor migrants who have come in search of jobs on the road and new land have become squatters.

One can assume, therefore, firstly, that the same situation will arise when part of the jungle in Rupendehi and Kapilavastu is cleared for the construction of the Indian road between Butwal and Nepalgunj. Secondly, that in the near future the population pressure will become most evident in the Terai and the Inner Terai, causing land fragmentation, deforestation and diminution of good pasture lands. Arable land will become even more scarce and, as migration is undertaken, more by necessity than choice, the attraction to the Terai and Inner Terai will increase. The possibility of industrial development in the near future seems unlikely, and employment in industry can only be expected to be minimal for years to come. Conflict between the various sections of society, the traditional inhabitants, the legal settlers and the illegal squatters, between the landowners and the landless, would seem to be the inevitable outcome in the not too distant future.

Ultimately the development of the Terai, if current trends continue, will be blocked. The surplus it produces is already rapidly disappearing. In the 1960s an estimated 500,000 tons of grain were exported annually. The current estimates are about 200,000 tons. As the Terai fills up, its agricultural production will increasingly be absorbed by the subsistence demands of its own population. Thus the problem of the Hills will be reproduced. The ecology of the Terai is less fragile but there are already signs

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of significant yield declines.

The missed opportunities in the Terai's agriculture are both a failure to apply new technology effectively and a failure to have a greater concentration on commercial crops that could give substantially higher returns than the traditional food grain crops now grown. The production of the main non-food crops, sugar, jute, tobacco and tea, is either stagnant or declining. The role of road communication in this situation is relatively small. Roads built in the Terai allow the marketing of produce throughout the year rather than just the five dry months. Road building in forest areas has definitely encouraged settlement (mainly illegal) in them. Road construction has also provided the income-earning opportunities to allow poor migrants to accumulate sufficient capital to start their own farming enterprises.

The problem of missed opportunities has not really been affected by road building, however. More and better irrigation, the more intensive use of fertilisers and improved seeds, and the growing of new crops are all needed to ensure further development. There has been little response. The reasons are not difficult to identify. There is an inadequate agricultural research and administration programme. Extension workers do not understand the reason for their advice nor is it underpinned by an adequate series of farm trials. The main source of technological progress comes from the narrow dissemination of ideas across the border from India. There are major deficiencies in the marketing of both food grains and other crops, which reduce the incentive to specialise and increase production. The government's clumsy attempts at intervention to gain a more direct control have created many difficulties. This

reduced incentive encourages the re-investment outside of agriculture of the surplus funds still being generated by it. Much of these funds are leaking into India. Even within Nepal there are opportunities in commerce, transport, education and smuggling which do not encourage a deepening of capital within agriculture. Road development only serves to make these alternative opportunities more attractive. Without an expansion and improvement in complementary administrative and infrastructure inputs, roads will not benefit agricultural development.

The roads have opened new areas for clearing forests. They could make the Hills a more attractive market for the Terai's surplus (as compared to India). This should become more important as the Hills' food deficit grows, but it will not become more important unless the Hills' purchasing power also grows. That is very unlikely. The roads do allow for easier transporting of agricultural inputs but these are not very effective without radical changes in agricultural extension and research.

It is not necessary to be as pessimistic about the Terai as in the case of the agricultural development of the Hills. Pressure on resources is still not so great as to prevent their re-allocation and the accumulation of productive capacity. The problem at present is to ensure that the current surpluses produced are realized by expanding and deepening the means of production and not diverted to exchange activities, leaked abroad to India or realized in completely unproductive ways through maintaining the bureaucracy, the army and the urban development of Kathmandu. The Terai has to move from the periphery to the centre of the Nepalese economic system. The State must serve its economic needs, not just act to extract its surplus. The political structure is therefore the arbiter of what is going to happen.

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