Lynn Bennett + Gabriel Campbell

NEPAL
RURAL HOUSEHOLD SURVEY

8 VILLAGES

A REPORT BY ARTEP
ASIAN REGIONAL TEAM FOR EMPLOYMENT PROMOTION
INTERNATIONAL LABOUR ORGANIZATION
BANGKOK

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DRAFT

Nepal

Rural Household Survey

8 villages

Bangkok, June 1976

Asian Regional Team for Employment Promotion (ARTEP)

Contents

Acknowledgements

This report is mainly an account of what was done and what was found during January-May 1974 in a rural household survey on income and migration in Nepal. The Rural Household Survey Board, consisting of Mr. M.P. Upadhaya, Chairman, Joint-Secretary National Planning Commission, Mrs. Meena Acharya, Research Department Nepal Rashtra Bank, and Mr. R.R. Singh, Director of the Labour Department, has administered the operation whereas ARTEP has provided financial resources and technical assistance.

The survey was conducted in support of a country survey mission on employment and economic development. A few tables were included in the general report of this mission and this document gives the full account of the exercise. The experts involved in the ARTEP office included Mr. H.K. Zevering, rural employment promotion, Mr. S.P. Agarwal, statistics, Mr. L. Lovdahl, statistics, and Mr. P. Looise, rural employment promotion and later rural institutions. Zevering, Agarwal and Looise have largely conceived the survey. In addition Mr. Agarwal has written an early draft on chapter III, Sources of Income and Mr. Looise held responsibility for elaboration of data, analysis and final report. Mr. Lovdahl has assisted in field supervision and preparatory work in Nepal. Messers Mahmood Marican and Naripone Sivanunwong have carried out numerous desk calculations and ARTEP's typing and reproduction staff took care of the report in its final stage.

In Nepal assistance from Mr. B.N. Bista at the Rashtra Bank should be mentioned. Translation of the questionnaire, training of field staff and field supervision have been taken on by him. Additional assistance and suggestions came from the Economic Analysis and Planning Division in the Ministry of Agriculture.

The survey has thus been a cooperative activity as much inside ARTEP as in collaboration outside. It has hopefully provided learning ground for many and is going to provide some insights to rural development planners in Nepal.

Bangkok, July 1976.

1. Introduction

Objective of the Survey

From January to March 1974 the Asian Regional Team for Employment Promotion (ARTEP) undertook a country survey in Nepal with the aim of indicating a development strategy which would lead to higher income while avoiding high income inequality and frictions in the labour market. ARTEP is a multidisciplinary team of experts financed by UNDP. The team's assignment is to assist Governments in the region in the formulation and implementation of national employment policies and programmes in their countries and in building up the technical and administrative services required for the effective implementation of short and long term employment promotion projects.

In Nepal data on the rural economy at household level are limited. A farm management study (FMS)[1/] was undertaken in 1968-69 by the Economic Analysis and Planning Division of the Ministry of Food and Agriculture. The study yielded a lot of valuable data on crop production and agricultural inputs at household level in 14 selected districts. However, it did not cover income data from livestock enterprise, nor from sources other than the agricultural household enterprise. Landless households were also not included in the study. Moreover, the data on net results of crop production had been compiled at district level or crop-wise while for the assessment of income distribution household level computations were required. It was however impossible to get back to the raw data.

During the fiscal years of 1969/70 and 1970/71 an Agricultural Credit Survey (ACS)[2/] was undertaken by the Nepal Rashtra Bank under direction of a Board representing various government and semi-government agencies. The main objectives of this survey were to assess the extent and nature of the need for credit among farmers and custom-service operators, the productivity of such credit and how the Bank could contribute in the field of financing agriculture. The information on household income resulting from this study could not be made available at a sufficient level of break-down to allow a detailed analysis. The classification of holdings according to size reveals surprisingly wide low brackets of farm size both for the Terai and the Hills compared with the frequency distribution of farm size in the Farm Management Survey. Data on landless households have not been included in the Agricultural Credit Survey.

1/ His Majesty's Government of Nepal, Ministry of Food and Agriculture, Economic Analysis and Planning Division, Kathmandu, 1971.

2/ Nepal Rashtra Bank, Agricultural Credit Survey Nepal, The Survey Report Vol. I-IV, Kathmandu, 1972.

A third known investigation into rural income patterns is contained in a study of the village and household economy in far Western Nepal.[1/] The coverage of this study was limited but gave in depth information on aspects of social structure and temporary migration related to income generation. In a Special Household Survey detailed data were collected from two clusters of households in the Hills and two clusters in the Terai. It is a pity that in this survey no information has become available on in-kind income and also that the livestock income has reportedly been underrated very much.

The studies above have been briefly mentioned to indicate the need for comprehensive rural income data. The survey on which we report here has been set up specifically to measure

(i) total income of all strata of rural households in Nepal;
(ii) income distribution in villages in Nepal;
(iii) the contribution of different sources of income to the total income of rural households in Nepal;
(iv) the influence of some indicators on total household income and on crop income of rural households in Nepal;
(v) some income characteristics of recently migrated households to be compared with settled households in the same area.

From the analysis of the survey data we would subsequently try to derive some tentative policy elements for a rural development strategy in Nepal. Apart from being useful in detecting certain structural elements in the rural economy, elements which could be used in formulating general policies surveys like this one can be very helpful as a benchmark in localities where more comprehensive rural development efforts are undertaken. At the local level results of a survey like the one reported on here can be made use of in programming for rural development.

From the following chapters it will be clear that the survey as it has been undertaken can not be taken as representative of rural Nepal. That is why only tentative conclusions can be derived from the results obtained. This survey should therefore be considered as a pilot exercise and it does, for that purpose, cover a sufficiently wide range of socio-economic conditions to bring out the problems likely to be encountered in carrying out a more large-scale survey of a similar nature.

As far as the factors influencing the level of household income are concerned, these may be revealed in a limited study and be valid in wide regions. The extent of influence may differ with local conditions and depending on the

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1/ Charles Mc. Dougal, Village and Household Economy in far Western Nepal, Tribhuvan University, Kirtipur, Nepal, 1968.

need for such information and the resources available surveys may be carried out in the relevant areas. It should be realized, however, that comprehensive income data are difficult to gather and that local surveys cannot be much simpler than the survey presented here.

As the problems related to the significant migratory movements in Nepal constituted a major part of the ARTEP mission's study package an attempt was made to incorporate some data collection on this into the survey.

The importance of household level information in designing rural and agricultural development policies is certainly recognized.[1/] The attempt embodied in this report aimed at an improved framework for surveying household incomes.

Selection of Villages

For purposes of development planning Nepal has been divided into four development regions. They are the far Western, Western, Central and Eastern regions. Within these regions three geographically distinct areas can be found. They are the mountain range of the Himalayas, the Hills and the Terai and Inner Terai. The Hills and Terai and Inner Terai are most populous. Table 1.1 gives a picture of the distribution of the rural population region-wise.

Table 1.1 Regional distribution of rural population and size of panchayats.

Region	Average panchayat population			Percentage distribution of population							
	Mountain	Hills	Terai & Inner Terai	Mountains	Hills	Terai & Inner Terai	Total	Mountains	Hills	Terai & Inner Terai	Total
Far West	1381	2824	3311	5.8	32.0	12.4	21.7	2.3	74.0	23.7	100
West	2146	2595	2716	24.5	29.0	12.3	21.7	9.6	66.9	23.5	100
Centre	2661	3059	2911	37.4	21.2	44.4	32.2	9.9	33.1	57.0	100
East	2341	2753	3248	32.2	17.7	30.9	24.4	1.2	36.4	52.4	100
Total	2300	2785	3027	100	100	100	100	8.5	50.1	41.3	100

Sources: See annex 1

1/ See e.g. the report of the workshop on Research Methodology of the Green Revolution, Manila, Feb. 19-23, 1973, p.2. This workshop was held as a preparation for the first general meeting of the Asian Association of Development Research and Training Institutes, Bangkok, Thailand, 30 July - August, 1973.

In the far Western and Western development regions the Hill population predominates while the other two development regions are characterized by a majority of the people living in the Terai.

The districts in which the survey villages were to be selected have been chosen from the Western and Central region as these regions are logistically most conveniently located and still represent a great deal of variation. The mountainous areas were excluded as these are rather inaccessible within the time limits that were set for the survey operations. These areas moreover show a high degree of variety in conditions and lodge only a small number of Nepal's population.

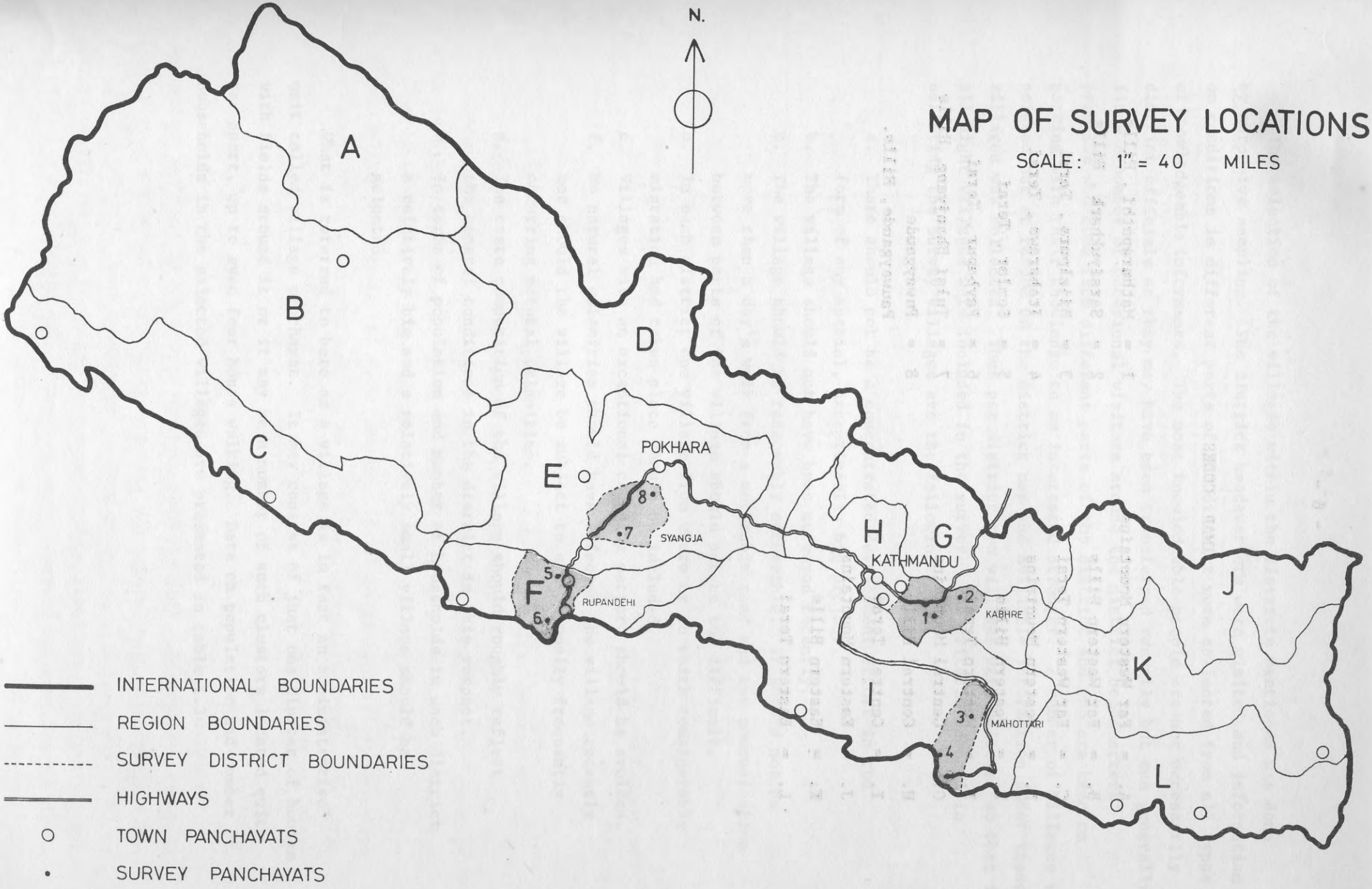
In the Western region villages were selected from Syangja and Rupandehi as these districts show a relative per capita income representative for this region and they are also easily accessible from the road Pokhara - Bhairawa. In the Central region Kabhre and Mahottari were selected.

Kabhre is accessible from the road Kathmandu - Kodari and Mahottari can be reached from the road to Biratnagar. The relative per capita income in Mahottari comes out low but that may be because there are no urban centres there. This district replaced the initial choice of Parsa in which Birganj is located. As in Birganj we find an important railhead for trade from India Parsa was considered not to be sufficiently representative for the Western Terai region. For the location of the districts selected see the map on p.5 . For data on economic base and relative per capita income see table 1.2

Table 1.2 Percentage GDP from agriculture and relative per capita income (Nepal = 100) in districts from which survey villages were selected (1970)

Items	Central Region		Western Region	
	Kabhre	Mahottari	Syangja	Rupandehi
% GDP from agriculture	86	72	85	70
Relative per capita income	51.0	96.8	46.4	151.9

Source: ARTEP-table derived from Reconnaissance Survey - Economic Appendix, December 1970 - COMTEC in collaboration with ALPINA and MACCHI. Tables 8.1 - 8.4


N.
MAP OF SURVEY LOCATIONS
SCALE: 1" = 40 MILES
A
B
C
D
E
F
G
H
I
J
K
L
POKHARA
SYANGJA
RUPANDEHI
KATHMANDU
KABHRE
MAHOTTARI
1
2
3
4
5
6
7
8
INTERNATIONAL BOUNDARIES
REGION BOUNDARIES
SURVEY DISTRICT BOUNDARIES
HIGHWAYS
TOWN PANCHAYATS
SURVEY PANCHAYATS

MAP CODES

A. = Far Western Mountains
B. = Far Western Hills
C. = Far Western Terai
D. = Western Mountains
E. = Western Hills
F. = Western Terai
G. = Central Mountains
H. = Central Hills
I. = Central Terai
J. = Eastern Mountains
K. = Eastern Hills
L. = Eastern Terai

1 = Mathurapathi , Hills
2 = Sarsiyukhark , Hills
3 = Bijalpura , Terai
4 = Itaharawa , Terai
5 = Semlar , Terai
6 = Raybapur , Terai
7 = Tulsi Bhanjyang, Hills
8 = Puwaygaude
Pauwaygaude, Hills.

The selection of the villages within the districts mentioned was done by purposive sampling. The district headquarters were visited and information on conditions in different parts of the district were collected from all types of knowledgeable informants. The most knowledgable people are not necessarily district officials as they may have been transferred recently but one generally finds a number of occasional visitors around the district headquarters' premises who come from different parts of the district and who are keen on parting with their knowledge to an interested stranger. A number of villages were pointed out at random on the district map and available information about these villages was collected. Thus per district two villages were selected so that in all eight villages were included in the survey. The criteria adopted in selecting the survey villages are the following:

a. There should not be a concentrated development effort in the form of any special, exceptionally big project.
b. The village should not have been surveyed recently.
c. The village should be reasonably accessible. It should not be more than a day's walk from a motorable road and the communication between parts of the village should not be too difficult.
d. In each district one village from where or to which considerable migration had taken place should be included.
e. Villages with an exceptional cropping pattern should be avoided.
f. No natural calamities should have effected the village recently nor should the village be subject to exceptionally frequently occurring natural calamities.
g. The caste composition of the village should roughly reflect the general conditions in the district in this respect.
h. In terms of population and number of households in each district a relatively big and a relatively small village should be selected.

What is referred to here as a village is in fact an administrative unit called village panchayat. It may consist of just one cluster of houses with fields around it or it may be a number of such clusters located quite far apart, up to even four hours walking. Data on population and number of households in the selected villages are presented in table 1.3

Table 1.3 Population and number of households in selected villages

Region	District	Village selected	Population Census 1971	Number of households	
				Census 1971	Survey enumeration
Centre (Hills)	Kabhre	Mathurapathi	2194	413	429
		Sarsiyukhark	4429	738	744
			(3059)		
Centre (Terai)	Mahottari	Bijalpura	4294	870	887
		Itaharawa	1483	252	263
			(2911)		
West (Hills)	Syangja	Tulsi Bhanjyang	2886	538	539
		Pauwaygaude	2158	426	450
			(2595)		
West (Terai)	Rupandehi		4873	896	1082
		Semlar	2728	457	450
		Raybapur	(2716)		

In brackets: average population in a village panchayat in the region indicated; from table 1.1.

Some general village data have been collected with help of a separately designed questionnaire. These data have not been used in the analysis however. The survey was primarily designed to focus on household level information. The number of villages was too small to come to conclusions on village differentials. The village data for two villages were moreover not collected in the prescribed format. At the stage of elaboration of the raw data, some use of village data has been made. As a reference which could be useful in subsequent similar surveys the village schedule is attached as annex 2.

Sampling

The sample of households interviewed was stratified on the basis of crop production potential. This has been measured by the sum of the area cultivated and the irrigated area because the area that could be irrigated was considered to yield on the average two times as much as unirrigated land. Initially stratification on the basis of land tenure was attempted but the differentiation on this characteristic appeared to be too small. The overwhelming majority of holdings appeared to be cultivated by the owners.

To facilitate stratified sampling of households a complete enumeration of households in the selected villages was undertaken. The format used for this purpose can be found in annex 3. As no agreement had been reached on the kind of stratification to be used the schedule is quite extensive. A question on migratory movements was included to make sure that sufficient recently migrated families would be in the sample. In general a much more concise enumeration schedule can be used. From table 1.3 it can be seen that the number of households enumerated in the selected villages did generally tally very well with the 1971 Census data. The high increase in number of households in Semlar is due to in-migration in that village. The chief of the village ("pradhan panch") told us that its population had tripled during the last decade.

The strata limits used are given in table 1.4. They differ for the Hills and the Terai as the average size of holding is much larger in the Terai. The strata limits have been fixed taking into account data from FMS[1/] on the size distribution of holdings. The sample taken from the different strata per village has been determined by practical requirements concerning the workload of the investigation teams and by the requirement to have a minimum number of five households

Table 1.4 Strata limits - Cultivated area + irrigated area (ares*)

Stratum code	Strata limits	
	Hills	Terai
0	-	-
1	1-20	1-34
2	21-41	35-68
3	42-61	69-169
4	62-above	170-above

* 1 are = 100 m^2 = 0.01 ha.

in any village stratum. In the case of the landless households the last requirement could not be met in three of the four Hill villages where less than five households were found in this stratum. Some correction in household classification had to be made on the basis of the detailed information from the survey itself so that in Itaharawa village, stratum four, the sample consists of only four households. The case has nevertheless been incorporated in the final analysis. The samples are given in annex 4.

1/ See p.1.

Out of a total of 4844 households 496 have been interviewed putting the sample at just over 10%. Within the stratum the procedure of systematic sampling[1/] has been adopted.

Development of the Questionnaire

A draft questionnaire has been formulated and subsequently tested in the field. The test was undertaken with the help of an interpreter. The final version of the questionnaire has been translated into Nepali and after a check by translation back into English was finally printed for use in the field. The questions have been made as detailed as possible and ample space has been provided to avoid the need for extensive additional instructions. On a number of items, especially the non-agricultural parts, still it was felt that more extensive precoding could have yielded better results. Whether this should be done by providing to the enumerators separate item check-lists or by precoding in the questionnaire itself is a matter that could be tested out.

The text of the questionnaire as it has been used in Nepal is available separately from this report. Taking into account the experience gained by its use in Nepal the questionnaire could be improved and developed into a more generalized income questionnaire with indication of alternative formats for some items that could be approached in different ways. In revising the questionnaire it should be attempted to reduce the time needed to complete an interview.

Operations

The idea to conduct a household level income survey developed after a preliminary mission to Nepal in which the state of micro-data was found to be as briefly described on pages 1 and 2 of this report. Discussions on the usefulness of the survey for the employment mission to Nepal resulted in an agreement to embark on it and to prepare a questionnaire in which the necessary items on income and migration were included. Contents of the questionnaire were frequently discussed and ultimately in November 1973 a number of copies were taken along to Nepal on a brief (2 weeks) mission in which the experts on statistics and agricultural employment promotion prepared the ground for the operations in Nepal. Through the Department of Labour cooperation was solicited from the Planning Commission and the Rashtra Bank. Representatives of these bodies formed the Rural Household Survey Board. It was considered of great importance to get more substantial

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1/ If e.g. one out of 13 households had to be selected, the first household selected would be the one with the serial number corresponding to the first number under 14 on the two digit random table. The other sample households would be each thirteenth on the list starting from the household following the selected one.

cooperation from the Ministry of Agriculture, Economic Analysis and Planning Division in the Marketing Services, as this division had gained considerable experience along with the Rashtra Bank in conducting rural household surveys. However, their survey program was already worked out for the year ahead and the support of the division had to be limited to participation in discussions on the set-up of the survey, some translation work and miscellaneous problems on various details of the agricultural part of the survey. The questionnaire that had been developed by ARTEP was in principle adopted and agreement was reached on the districts from where the villages would be selected.

During the November 1973 visit a draft contract between ARTEP and the newly created Rural Household Survey Board was prepared. At the same time all the four headquarters of the selected districts had been visited where information about potential survey villages was collected. This trip was used at the same time to interview a number of different kinds of respondents using the draft questionnaire.

After the necessary revisions to the questionnaire were made the field phase of the survey started in January 1974. 16 enumerators were recruited. They were of graduate level in economics or commerce. Three supervisors were appointed on deputation from their departments i.e. Labour Department, Planning Commission and Central Bureau of Statistics. A fourth supervisor was recruited separately. The operations in each district were carried out by a team of four enumerators and a supervisor. After brief instructions the teams undertook the enumeration of all households in the selected villages. Including instructions and preparation the enumeration took 3 weeks. The 16 enumerators had listed a total number of 4844 households by that time.

In the meantime translation and printing of the questionnaire was finalized. To this end as well as for training of enumerators and other central activities ARTEP was assisted by a counterpart from the Nepal Rashtra Bank. Towards the end of the enumeration stage each team was visited from Kathmandu to control field operations and to sound any difficulties that were encountered.

Upon arrival in Kathmandu the enumerators listed the households from the "Household Listing and Stratification Schedules". For each household the figure indicating its crop production potential (see p.8) was calculated in local area units. On the basis of strata limits[1/] as expressed in local area units the households were subsequently stratified. (see for

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1/ See table 1.4, p. 9

area units annex 5). A four days preparation course was conducted in Nepali to make the enumerators familiar with the questionnaire to be used on the selected households. Problems on all aspects of the field work like housing, extensive walking, internal organisation of the team's work, conduct with the village population in general and the respondents in particular etc. were discussed simultaneously. One day was devoted to a try-out in a village in the surroundings of Kathmandu.

In the meantime stratification had been completed and the sample was drawn. From completion of enumeration till departure of the enumerators for the actual interview work 1½ week elapsed. 60-70% of the time was spent on listing for stratification and the rest for training.

Immediately after departure of the enumerators a supervising visit was paid by ARTEP-members and their counterparts-cum-interpreters. This was done to review the results of the first interviews and to provide some practical guidance on special cases and also on operational matters. A similar visit was paid to all four teams towards the end of the investigation when the teams had moved to the second village in their district. At that time one of the ARTEP-members was accompanied by one of the Household Survey Board members. Three teams completed the interviews in one month while the fourth team needed 1½ month.

In Kathmandu the preparation of the coding catalogue[1/] and other arrangements for coding were taken up. It was decided to code in separate coding sheets from which punching could be done easily. A programmer assisted in the whole process and wrote some AUTOCODER-programmes for initial listing, sorting and summarizing of the results. Coding, scrutiny and a preliminary print-out of the data took altogether two months and a week. Two types of print-out were prepared, one with data per household and one with data per subject. For the crop data a crop-wise tabulation was prepared. For the main conversion rates used in the elaboration of the data see annex 6.

Elaboration and coding of the data were carried out by 11 enumerators and one additional staff. The supervisors were maintained in service till they had completed the scrutiny of the questionnaires. This took roughly one month.

Tabulation and other analysis has been carried out on desk calculator from the initial print-outs of the data. Only for some regression analysis computer services have been hired.

1/ The coding catalogue is separately available with ARTEP.

Summary on Set-up and Time-table of Survey

Activity	When and where
Questionnaire design	Sept./Oct. 1973, Bangkok
Selection of 4 districts	Nov. 1973, Bangkok and Kathmandu
Selection of 8 villages (2 per district)	Nov. 1973, district headquarters
Enumeration of all households (4844)	Jan. 1974 (3 weeks), villages
Stratification of households and Training of interviewers	Feb. 1974 (1½ week), Kathmandu
Sampling of households (496) from 5 strata	Feb. 1974, Kathmandu
Interview of Sample households	Feb/March 1974 (1-1½ month), villages
Elaboration, coding and data summary	March/May 1974 (2½ months), Kathmandu
Summary tabulation and detailed report	June 1974/July 1976, Bangkok (with interruptions)

2. HOUSEHOLD INCOME

Concept and Limitations

As measurement of income in this study, use is being made of the concept of household income. It refers to the remuneration of household resources which consist of one or more of the usual trio of labour, land and capital with management included in labour. Cost incurred for outside services and materials or commodities purchased are subtracted.

In agriculture use is being made of "net farm output or social income from farming"[1/] which refers to the remuneration of all resources used in the production process, a remuneration that may be shared by the government, landlords, investors or credit agencies, hired labourers and the operator and his family. Household income in this context should then be perceived as that part of "net farm output" which initially falls due to the operator and his family i.e. the household which is the focal subject of investigation. It is stated "initially" here because no allowance has been made for direct taxes.

Thus, household income is:
gross income from crops[2/] + (plus) gross income from livestock[3/] + income from wages + income from other sources

- (minus) cost on crop production [3/] - cost on livestock[2/] - cost on buildings - cost on tools - cost on hired labour - cost on animal labour - other cost on agricultural and non-agricultural enterprises (including interest and rents paid)

Details on different components of family income will be treated in chapter 3. Throughout in-kind income and cost-items have been included. Income generated by building the own residence has been excluded in the calculations. In a separate calculation on the assumption that 50% of the depreciation on all the residences represents the rental value earned by the households' own labour inputs it was found that household income on the whole would have been higher by 2.8%.

1/ Yang, W.Y. Methods of Farm Management Investigations, FAO, 1965, Agricultural Development Paper No. 80.

2/ Except by-products produced and used on own farm.

3/ Except farm manure produced and used on own farm.

It has been assumed that buildings used for economic activities have been constructed by the family itself. Therefore no depreciation has been deducted on these.

Another complication at the time of composition of the household income was the question of manure produced and used. As reporting on the use of manure was better than on the production of it the livestock proceeds have been augmented with the value of the manure used thereby assuming that only manure from the own farm was used. However, this again creates a bias towards higher manure proceeds in the Hill villages as relatively more manure is processed into dung cakes in the Terai, something that has not been accounted for in the survey. On the basis of an estimate of the proceeds of livestock in the Terai that had been omitted in this way we may assume that on an average household incomes will have been underestimated by N Rs. 25 or 1% (see annex 7).

It has been found that income estimates from non-agricultural household enterprises as well as from property are difficult to gather in a rather extensive survey like this one. The general feeling is that more income should have been reported from these sources as well as possibly out of trade.

Comparison of the income as it is defined here, with national income figures is possible. The national income for that purpose should be calculated on the basis of aggregation of received personal incomes. In this process income due to certain households but received by other ones (remittances) or collective bodies (village voluntary labour) is added to the total of personal incomes whereas transfers are subtracted. We have not taken into account any unpaid labour contributions to village projects as we did not know of existence of any in the survey villages. Unpaid mutual labour was supposed to cancel out. In the case of remittances, those received have been added to the income while those paid have been subtracted.

The period over which the information was gathered is one year. That means that for all non-seasonal items 1973 has been taken as the reference year whereas for the gross income of and direct cost on crop production the last wet and dry season had to be reported on.

On the income concept, see also chapter 7.

Levels of Income per Stratum (household and per capita)

In table 2.1 we find a summary of the data on income levels. It can be seen that there is a regular increase in average income per household as the household belongs to a higher stratum. However, the relationship between crop production potential, on which the stratification is based, and levels of income is not very evident as will be demonstrated below. The trend is

already less marked in the case of per capita income levels because of bigger families in the upper strata. See annex 8. Family size and household income level are apparently positively related. It is significant to note that there is no marked relationship between family size and per capita income (see table 2.2)

On the whole per capita income appears to be low, N Rs. 308 on an average in the Hill villages and N Rs. 420 in the Terai villages. Households in the Terai villages are on an average somewhat better off than those in the Hill village but the lower strata in both regions seem to have the same low level of income which is just somewhat below N Rs. 300 per capita per annum. For that matter the three lower strata represent 85% of the population in the Hill villages surveyed.

Table 2.1

Household income per stratum (N Rs/year)

Location \ Strata*	0	1	2	3	4	Average
			Per Household			
Hill villages	872	1,258	1,987	2,538	3,309	1,681
Terai villages	1,316	1,377	1,418	2,171	4,416	2,393
			Per Capita			
Hill villages	276	293	308	293	388	308
Terai villages	289	296	292	377	594	420

* See p. 9

whereas they represent only 48% in the Terai villages. Income distribution on the basis of income per household reveals that especially in the Hills still a considerable

Table 2.2 Income per capita and family size

Size class	TERAI			HILLS		
	Family sizes	Number of families (weighted)	Income per capita (N Rs)	Family sizes	Number of families (weighted)	Income pe capita (N Rs)
I	1,2, 3	547	420	1,2	250	499
II	4	480	527	3	341	312
III	5	433	406	4	335	391
IV	6	372	394	5	357	288
V	7,8	476	394	6	370	291
VI	9,10,11,12 13,14,19	379	415	7,8	253	361
VII	-	-	-	9,10,11,12,13, 14,15,16,20,21,24	258	236
All	-	2,687	420	-	2,164	308

proportion of high income families can be found in the lower strata. Compared with the distribution of all households among the different strata low income households in the Hills are concentrated in stratum 1 whereas those in the Terai are not significantly concentrated. In the Terai the higher income households are relatively frequent in stratum 4. Also in the Hills there is a tendency for high income households to be found relatively more often in higher strata but it is not very outspoken (see table 2.3 a).

The importance of including per capita income measurement in the analysis comes out in table 2.3 b. Here we see that for the Hills any concentration of income classes disappears almost completely if income levels per capita are being ranked. For the Terai also the high incomes per capita remain relatively concentrated in stratum 4.

A tentative conclusion from these findings may be that only for high income groups in the Terai villages relative endowment with land and water resources, i.e. crop production potential, has played an important role. The structure in the Hills may be such that almost for everybody it is a matter of bare subsistance by which those who cannot get access to this level of income either have to leave or do not survive. The case of low income households and persons in the Terai among the well endowed strata could be explained from high risk and inefficient farming whereas also underrating of incomes could have been more important among this group.

Table 2.3a Percentage distribution of households with low and high incomes according to stratum

Stratum		0	1	2	3	4	all strata [1]	average household income (NRs.)
Hills	Three lowest deciles [2]	1	82	7	6	3	99	465
	Three highest deciles	0	34	38	13	14	99	3390
	All households	1	59	26	8	7	101	1681
Terai	Three lowest deciles	21	15	17	28	20	101	508
	Three highest deciles	3	4	7	26	58	98	5518
	All households	23	10	14	25	27	99	2393

1/ Percentages do not add up to 100 due to rounding

2/ A decile is ten per cent of the households represented in the sample. To identify each decile households are ranked according to income level as found in the sample households.

Table 2.3b Percentage distribution of persons with low and high incomes according to stratum

Stratum		0	1	2	3	4	all strata	average per capita income (N Rs)
Hills	Three lowest deciles [1]	1	53	32	10	4	100	102
	Three highest deciles	0	43	28	13	16	100	592
	All households	0	47	30	12	11	100	308
Terai	Three lowest deciles	20	10	15	31	24	100	102
	Three highest deciles	9	3	4	24	60	100	885
	All households	19	9	12	26	35	101 [2]	420

1) For explanation on deciles see note [2] table 2.3 a.

2) Percentages do not add up to 100 due to rounding.

Income Distribution (household and per capita)

The rural income distribution is a point of concern as it has been often found that introduction of the new agricultural technology sparked off by the high yielding cereal varieties has led to increased inequality such that the rural rich have become richer and the rural poor not. The evidence does not seem to be unanimous though. A study in Aligarh district in India [1] where a concentrated programme for a green revolution was launched in 1961, suggested that from 1963 to 1968 income distribution had become less skewed while, witbin the district, areas with a higher average income tended to have a more equal distribution of it. Kuznets [2] came in fact to similar tentative conclusions on the basis of national data for several countries and regional data for some countries. In a summary article based on more extensive data (56 countries) Paukert [3] illustrates that in the initial stage of development inequality generally goes up while it declines steadily after passing a point in the range of $201-$500 of GDP per capita as measured around 1965.

1/ Singh, Katar, The impact of new agricultural technology on farm income distribution in the Aligarh district of Uttar Pradesh, Pant Nagar Agricultural University, Indian Journal of Agricultural Economics Vol. XXVIII No. 2 April/June 1973.

2/ Kuznets, Simon, Distribution of Income by Size, Harvard University, Economic Development and Cultural Change Journal, Vol. XI, 2, part II, Jan. 1963.

3/ Paukert, Felix, Income Distribution at Different Levels of Development: a Survey of Evidence, ILO, International Labour Review Vol. 198, Nos.2-3. August-September 1973.

Table 2.4

Income Distribution, per Household and Per Capita Income

DECILES	Per Household			Per Capita		
	HILLS					
	Average Income (NRs)	% of Total	Cumulative % of total	Average income(N Rs)	% of Total	Cumulative % of total
1	133	0.8	0.8	37	1.2	1.2
2	502	3.0	3.8	119	3.9	5.1
3	757	4.5	8.3	150	4.9	10.0
4	972	5.6	13.9	187	6.1	16.1
5	1139	6.8	20.7	224	7.3	23.4
6	1396	8.1	28.8	264	8.6	32.0
7	1706	10.2	39.0	326	10.6	42.6
8	2025	12.0	51.0	404	13.1	55.7
9	2772	16.9	67.9	510	16.5	72.2
10	5380	32.1	100.0	860	27.8	100.0
All	1681	Gini Ratio = 0.43		308	Gini Ratio = 0.38	
	TERAI					
1	132	0.6	0.6	21	0.5	0.5
2	549	2.3	2.9	102	2.4	2.9
3	848	3.5	6.4	182	4.2	7.1
4	1056	4.3	10.7	226	5.3	12.4
5	1366	5.6	16.3	288	6.7	19.1
6	1641	6.7	23.0	345	8.0	27.1
7	2180	9.0	32.0	460	10.7	37.8
8	2853	11.7	43.7	589	13.7	51.5
9	4329	17.8	61.5	806	18.8	70.3
10	9316	38.6	100.1	1252	29.7	100.0
All	2393	Gini Ratio = 0.51		429	Gini Ratio = 0.44	

Comparisons of villages in the survey regarding size distribution of income would not be meaningful here as the samples of villages and households per village are not big enough to justify any significant conclusions. We have computed a measure for size distribution of household incomes and per capita incomes, the Giniratio, taking the households in the Hills together and separately those in the Terai. The results are presented in table 2.4. See for calculation of Giniratio annex 9.

For this computation negative incomes have been taken as zero. Inequality in the Terai is clearly higher than in the Hills. The average income level in the Terai as we have seen in the para above is also higher. As most of the agricultural development activities have so far been concentrated in the Terai while Government support will be solicited mostly by the relatively big farmers this may be the result of the process of development itself. As indicated above it may be expected that in the initial stage of development income distribution deteriorates.

In rural areas developmental activities in the field of agriculture are naturally most pronounced. That means that other circumstances being equal a more skewed distribution of land holdings leads to a more skewed distribution of income. This seems to be the case in the Terai. On the basis of the survey data on area cultivated per household a Gini concentration ratio of land per cultivating family was computed. The ratio in the Hills appeared to be 0.47 while in the Terai villages 0.55 was found. As an illustration percentage distribution of land among cultivators ranked according to area cultivated per household is shown in table 2.5.

Table 2.5

Percentage Distribution of Total Area Cultivated According to Area Cultivated per Household

Deciles	Hills			Terai		
	Average area cultivated per household (ares*)	Percentage of total area cultivated	Idem, accumulated	Average Area cultivated per household (ares*)	Percentage of total area cultivated	Idem, Accumulated
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2.7	1.2	1.2	13.8	0.8	0.8
2	5.3	2.4	3.6	33.2	2.0	2.8
3	7.8	3.5	7.1	47.8	2.9	5.7
4	10.4	4.7	11.8	66.6	4.0	9.7
5	13.2	6.0	17.8	79.3	4.8	14.5
6	15.9	7.2	25.0	94.6	5.7	20.2
7	21.7	9.9	34.9	120.2	7.2	27.4
8	27.9	12.7	47.6	180.3	10.8	38.2
9	38.6	17.5	65.1	274.7	16.5	54.7
10	77.1	34.9	100	754.8	45.3	100

* 1 are = 0.01 ha. = 100 m^2.

Although the material is already quite old for comparison we give the Gini concentration ratios for rural areas in a number of other countries in Asia (see table 2.6).

Table 2.6 Concentration ratios of income distribution in rural areas.

Country	Year	Ratio
Nepal Hills	1973	0.43
Terai	1973	0.51
Bangladesh	1963/64	0.33
	1966/67	0.31
	1968/69	0.27
India	1961/62	0.34
Philippines	1965	0.43
Sri Lanka	1952/53	0.45
Thailand	1962/63	0.44

Sources: Nepal - table 2.4
Other countries - The Bangladesh Development Studies, Vol II, Oct., 1974, Number 4, p.775. Mohiuddin Alamgir , Some Analysis of Distribution of Income, Consumption, Saving and Poverty in Bangladesh.

N.B. In Nepal, Bangladesh, and Thailand data pertain to households as recipient units while for the other countries it is not known.

The impression is that in the Nepalese rural areas income distribution is of the most skewed especially in the Terai.

Income per Family Worker

To estimate income per worker the supply of family labour for each household was computed on an adult equivalent basis.[1/] Income per worker indicates the sum of the value of the household's economic activities,

1/ Details in Chapter 7.

the balance of transfers and income from property per adult equivalent worker in that household. If we assume that an adult worker works 300 full days per year then the income per worker divided by 300 represents the average wage rate equivalent received per worker.
(see table 2.6)

Table 2.6

Income, Equivalent Wage Rate and Land Cultivated per Adult Equivalent Family Worker

Strata		0	1	2	3	4	All
Income (NRs)	Hills	656	593	573	614	755	607
	Terai	793	810	731	1034	1879	1197
Equivalent Wage rate (NRs)	Hills	2.18	1.98	1.91	2.05	2.52	2.02
	Terai	2.65	2.70	2.44	3.45	6.27	3.99
Land Cultivated (ares)	Hills	-	4.3	7.8	10.8	20.7	7.9
	Terai	-	10.5	24.8	44.2	150.6	63.9

The equivalent wage rate is low both in the Hills and in the Terai but that could be expected from the generally low income level. It is relatively higher in the group with the biggest land holdings. This may not reflect a higher labour productivity of family labour in these strata. The proportion of hired labour is higher in that group. Only on the basis of actual participation in the activities of the household enterprise and other economic pursuits could labour productivity be assessed. On the income side allowance should first be made for the remuneration of the household's capital assets brought in. Although accurate looking estimates could be developed to adjust for these elements it has not been attempted because of its arbitrariness. On balance it is the total remuneration to the household's assets that counts within a certain social and economic structure. The main family asset is usually land and it will be clear that in the higher strata the value of it per family worker will be relatively higher so that the equivalent wage as presented in table 2.6 would have to be relatively more reduced there to arrive at a realistic measure stick for family labour productivity. By how much, that depends on the imputed rate of interest which is arbitrary to a great extent. What is also arbitrary

is the judgement on what should be called labour especially on the larger farms where so-called management activities are significant. Presence at the farm has in fact been taken as contributing to the household's economic activities regardless of the family member's actual pursuits during such presence.

In the computation of the number of adult equivalent workers a day of labour of children, females and males has been taken as equal. The income per worker therefore can be compared with the average wage rate for family members earning wages in and outside agriculture also taking the above categories with equal weight. The average in the Hill households appeared to be NRs.2.74 while in the Terai the amount was NRs.4.38 per day. This is even above the equivalent wage level from table 2.6. Household enterprises beget an equivalent wage of about NRs.2 in the Hills and NRs.4 in the Terai. Although only a small part of non-wage income originates from transfers and property income (11% in the Hill villages and 7% in the Terai villages) this re-inforces the indication of a relatively low family labour productivity as this type of income is not related to labour inputs.

On an average an adult equivalent family worker in the Hills avails of 8 ares of land while in the Terai we find 64 ares of land per family worker (see table 2.6). As there is a big difference in price of land per area unit in the two regions the value of the piece of land available to the Hill family worker is about NRs 6,000 while the 64 ares available to the Terai family worker would roughly be worth NRs 4,800.[1/] To just indicate the dynamics of the income structure we could

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1/ From appendix (table-22) on p.125 of the FMS report it was computed that the average investment in land per are ranged from NRs 84 to NRs 154 in the Hills and from NRs 32 to NRs 59 in the Terai according to size class of farms. This suggests a much lower price of land in the Hills in 1968-69 than was reported at the time of the survey, 1974. The reported prices of NRs 750 and NRs 75 per are respectively would mean an increase of roughly 600% in the Hills since then and about 60% in the Terai. Prices recorded in 1971 can be found in Table 20 of "An evaluation of Land Reform in Nepal, Volume - II" by M.A. Zaman. For Eastern and Western Hills average sales prices mentioned are NRs 9,024 and NRs. 10,506 per hectare respectively. Purchase prices there were found to be NRs. 16,384 and NRs. 21.593 per hectare on an average. In the Eastern and Western Terai sale and purchase prices recorded were NRs. 3,504; NRs 1,497; NRs 3,438 and NRs. 2,037 respectively. In the FMS the investment in land ranged from 43% to 74% of total farm business investment in the Hills and 60 to 84% of total farm business investment in the Terai depending on size class of farms. Land as reported in the survey for which money was borrowed and for which consequently interest was accounted for as a cost item is negligible in area. On a total estimated value in the Hills of NRs. 5 million worth of land in the survey and NRs.1.6 million in the Terai only NRs. 2119 and NRs. 350 of interest paid was recorded.

value the cost of this investment at a 10% imputed interest and find out that in the Hills for that matter the calculated remuneration to the family worker disappears altogether. Furthermore the equivalent wage rate per family worker ranges between NRs. 1.91 and NRs.2.52 in the Hill villages and between NRs.2.44 and NRs.6.27 in the Terai villages according to size class of farms while the rate for landless is NRs. 2.18 and NRs. 2.65 for Hill and Terai villages respectively. The fluctuation in cultivated area per adult equivalent family worker is much higher (see table 2.6). That means for Terai farms that in the small size class very little investment in land is made whereas in the biggest size class the higher than average investment is duly offset by a higher equivalenr wage rate. If we account for imputed interest on investement in land only the Terai family worker is left with a remuneration for his labour input (from NRs.1.80 to NRs.2.50). Size classes 3 and 4 in the Hills would have a significantly negative labour productivity for family labour if interest on investment in land is similarly accounted for 1/

Remuneration for labour taken as described above means that the landless family labour in the Hill as well as in the Terai villages earn more than the landed family labour. In the Terai where most of the landless wage earners get their income from agricultural wages it means that, if they are employed, they earn slightly more than own-account workers in the same occupation. The landless Hill workers on the other hand generate most of their income out of non-agricultural wages and enterprises. Labour productivity in this multifarious sector cannot be estimated from the survey and may very well be considerably above the same in the agricultural sector.

The difference between equivalent wage rate for the landless and the wage rate calculated for the reported wage incomes (NRs. 2.18 versus NRs. 2.74 in the Hills and NRs. 2.65 versus NRs.4.38 in the Terai) shows that the landless workers have on the average not been able to secure an income which corresponds to full time employment at the prevailing average wage rate. Full time employment taken at 250 days instead of 300 days as has so far been assumed still shows underemployment (or rather "under-productivity") in the Terai while in the Hills, on this criterion, we could speak of full time employment (or rather "full productivity") but of course at a very low level of income.

From point of view of remuneration of labour one could conceive of the argument whereby an average minimum wage level per adult equivalent worker is fixed in the computations and whereby the thus calculated imputed wage bill for family labour is deducted from the household's enterprise's income.

1/ We found some farm families that rent land but for this overall picture these cases can be neglected as the rent paid does not add up to more than 0.5% of the equivalent wage.

In the situation as it has been depicted so far we then have to conclude that even at the low current "market" wage rate there is a very small return to capital especially in the Hills. The possibility of acquiring additional land out of farm income to accommodate a growing family has become negligible there. It means indirectly that the price of food in the Hills has become prohibitively high. The reported market price for food(e.g. NRs. 1.46 for maize in the Hills, see annex 15)pertains to only a very small part of the food produced as very few farmers sell anything and those who have to buy have no purchasing power. Even the urban population may because of patterns of land-ownership to a great extent avail of their own food either out of rents, through family ties or as the result of farming by a caretaker. In the Terai the position is somewhat better but also there it is clear that at a reasonable wage rate returns to capital are very low.

With the current food balance nationally still in a reasonable position the above situation suggests very strongly a reallocation of production as well as to some extent human resources. In so far as this means a considerable shift to non-agricultural enterprises in the Hills, although considerable increase in urbanisation for that purpose in the Terai should of course not be ruled out, an adequate food distribution system should pull money out of investment in land and channel into likely more remunerative pursuits in the non-agricultural sector. The economics of the agricultural production in the Hills and in the Terai as revealed by the survey will be discussed in Chapter 4.

Regression analysis on household income

In an attempt to identify the elements responsible for variations in household income a regression analysis was carried out with household income of the families as dependent variable. The following independent variables were considered as possible explanatory factors on income variations:

(i) cropping potential (= cultivated area + irrigated area)
(ii) cultivated area
(iii) irrigated area
(iv) direct cost on crop production per area unit harvested
(v) gross income out of crop production per area unit harvested
(vi) average value of livestock (= ½ (opening stock value + end stock value))
(vii) number of adult equivalent workers
(viii) operating cost on crop production per area unit harvested
(ix) number of household members
(x) location (district)
(xi) sex of head of the household
(xii) caste (see annex 10)
(xiii) proportion of adult equivalent workers "available" for household enterprise activities. (see p. 67)
(xiv) net income out of household enterprises per adult equivalent worker "available"

Three sets of regressions have been carried out. One each for landed households in the Terai and in the Hills, a third one for landless households.

After a number of runs the following equations showed the best fit with all coefficients significantly differing from zero at a 95% probability level. (In brackets t-value of coefficient estimates are given).

Landed households in the Terai

$$Y = 1616 + 198X_1 + 496X_2 + 1.18X_3 + 321X_4 - 26X_5 + 974X_6 + 1329X_7$$
$$(2.275)\ (3.429)\ (6.426)\ (2.970)\ (-6.538)\ (3.935)\ (3.380)$$

$R^2 = 0.6508$

$F = 47.65$

$n = 187$

Y = household income in Rs.

X_1 = cultivated area in Ha.

X_2 = irrigated area in Ha.

X_3 = average value of livestock in Rs.

X_4 = number of adult equivalent workers in the household

X_5 = proportion of adult equivalent workes "available" for household enterprise activities in percentages (see p.67 of this report)

X_6 = belonging to caste group (1); see annex 10 of this report

X_7 = belonging to caste group (8); see annex 10 of this report.

Landed households in the Hills

$$Y = -71 + 1083X_1 + 0.61X_2 + 226X_3 + 62X_4$$
$$(4.378)\ (5.064)\ (3.466)\ (2.090)$$

$R^2 = 0.4554$

$F = 43.69$

$n = 214$

Y = household income in Rs.

X_1 = cropping potential (cultivated area + irrigated area) in Ha

X_2 = average value of livestock in Rs.

X_3 = number of adult equivalent workers in the household

X_4 = gross income out of crop production per area unit harvested in Rs. 1,000/Ha.

Landless households

$$Y = 782 - 0.86X_1 + 388X_2 + 57X_3 - 8.5X_4 + 842X_5$$
$$(-2.072)\quad (4.628)\quad (3.278)\quad (-3.676)\quad (2.771)$$

$R^2 = 0.3642$

$F = 9.51$

$n = 89$

Y = household income in Rs.

X_1 = average value of livestock in Rs.

X_2 = number of adult equivalent workers in the household

X_3 = net income out of household enterprises per adult equivalent worker "available" in Rs.100/worker (see p.67 of this report)

X_4 = proportion of adult equivalent workers "available" for household enterprise activities (see p.67 of this report) in percentages

X_5 = head of the household male.

All F's are significant meaning that R differs from zero with a probability of at least 99% . The extent to which the independent variables explain the total variance of Y, the household income is given by R^2. In the case of landed households in the Terai it is 65%. For landed households in the Hills it does not reach higher than 46% whereas the equation for landless households explains only 36%.

The magnitude of the coefficients in the equation is still beset with uncertainties. Taking the landed Terai households the given coefficients point to a 95% probability range within which the actual coefficient falls, as follows:

variable	given coefficient	95% probability range
X_1	198	26 - 370
X_2	496	209 - 782
X_3	1.18	0.82 - 1.55
X_4	321	107 - 536
X_5	26	18 - 34
X_6	974	484 - 1464
X_7	1329	550 - 2107

Taking into account the statistical limitations outlined above we may now elaborate on the meaning of the resulting equations.

Landed households in the Terai could increase their household income with NRs. 198 for each additional hectare of land available. If this land would be irrigated it would yield another NRs.496 on the average. The coefficients suggest that making irrigation available yields more than just increase the cultivated area. For landed Hill households the combination variable cultivated area + irrigated area showed a significant relation with household income. As productivity of land is higher in the Hills (see also chapter 4) we find here also that additional area for cultivation and additional irrigated area yield higher returns than in the Terai.

Livestock appears to be a profitable investment for landed households although twice as much in the Terai as in the Hills i.e. NRs. 1.18 for one rupee invested as against NRs. 0.61 for one rupee invested.

An additional adult equivalent worker in the household adds on NRs.226 in the Hills and NRs.321 in the Terai. It is clear that this is below the price to hire an additional worker. It is also well below average labour productivity (see table 7.5). As expected on the basis of the high land pressure in the Hills the increment in net income for a worker there is lower than in the Terai. Under present conditions, however, even in the Terai simply adding labour to the existing production machinery does not yield a return sufficiently high enough to consider the additional worker productively employed (see also p. 92).

In the Hills it was found that a premium was to be obtained on intensive cultivation, that means on raising the gross income per Ha of cultivated land. Per Rs.1,000 increase on a Ha of land income could rise by NRs. 62. This is very low though and it suggests that within present practices not much gain can be obtained from intensifying cropping patterns or increasing yields. Surprisingly such indication was similar in the Terai where variables related to the intensity of cultivation were not found to relate significantly to household income at all.

An interesting relationship for Terai households is the one between household income and the proportion of family labour dependent on household enterprises. This relationship is inverse, as expected. As household enterprises tend to show a labour productivity below wage rates it could be expected that household income would be lower the more households depend on such activities for a living. Per percentage increase of dependence on household enterprises NRs.26 of household income is forfeited.

Another specific Terai feature is the outcome of a caste factor determining income levels. The caste group consisting of Brahmins, Bhumihars, Chhetris, Rajputs and Thakuris comes out at a NRs.974 higher level of household income. Magars, Tamangs, Gurungs and Rais, migrated from the Hills to the Terai seem to be doing even better with an additional NRs.1329 on the average. In the Hills, among landed households no such pure caste influence on household income was found. It is not clear what the underlying reasons for the caste group influence in the Terai is. It is not the cultivated area, nor the irrigated area and also not the livestock inventory that could be in favour of these caste groups because these factors have been accounted for separately in the equation.

Landless households incur losses on livestock i.e. per invested NRs. as much as 86 paisa. This should partly be explained by feed cost allocation in the income calculations out of livestock which are given in detail in chapter 4. It is significant to note that among landless workers an additional household member could increase the income by NRs 388 which is higher than in the case of landed households. The third independent variable explaining variation in landless household income shows that increased (net) productivity of non-wage labour can influence income levels positively to the extent that a NRs 100 increase in productivity results in NRs 57 additional household income. As with Terai landed households the proportion of adult equivalent family workers dependent on household enterprises is negatively related to household income. Here each percentage in addition means a decrease of NRs. 8.50 in household income. For the fact that male headed households on the average can avail of an additional NRs 842 the underlying logic is not clear. Of course, discrimination of women headed households on all sorts of opportunities could be mentioned and also a possibly lower female labour efficiency. Women wages are found to be lower than male wages, that is at least a fact.

3. Sources of Income[1/]

Concepts

Households included in the survey derive their income from a variety of sources. For purposes of this study, the analysis has been done in terms of the following eight sources or components of income, taking into account only the net contribution of each source:-

(i) crop production,
(ii) animal husbandry,
(iii) agricultural wages and salaries,
(iv) non-agricultural wages and salaries,
(v) non-agricultural household enterprise,
(vi) pensions,
(vii) remittances,
(viii) other sources

In animal husbandry keeping of draught animals has been included. Where the source of wages and salaries was not mentioned they have been classified as from non-agricultural sources. The amount of wages and salaries for which a source was not mentioned came to 8.8 per cent of the total amount reported in the survey.

For the sources mentioned household income was computed as follows:

Source	Income elements	Cost elements
Crop production	(1) Value of main products	(1) Value of own and purchased seed used
	(2) Value of by-products	(2) Value of manure used
		(3) Value of fertilizer used
		(4) Value of pesticides used
		(5) Water charges
		(6) Expenditure on hired casual labour
		(7) Part of permanent hired allocated to crop production
		(8) Expenditure on hired animal labour
		(9) Value of use of own traction

1/ For concepts see also para. "Concepts and limitations" on p. 14-15.

Source	Income elements	Cost elements
		(10) Expenditure on tools
		(11) Repair and maintenance on buildings allocated to crop production
		(12) Rents
		(13) Interest on loans for crop production
		(14) Cost on land improvement
Animal husbandry	(1) Value of livestock products including the value of own manure used.	(1) Value of by-products of crop production [1/]
	(2) Value increase of livestock inventory	(2) Cost of feed other than by-products
	(3) Value of use of own draught animals	(3) Part of permanent labour allocated to animal husbandry
	(4) Value of receipts on draught animals hired out	(4) Repair and maintenance on buildings allocated to animal husbandry
		(5) Interest on loans for animal husbandry
		(6) Other cost on livestock (Stud fee, veterinary services, medicines)
Wages and salaries	(1) Cash receipts	Expenditure on tools
	(2) Value of receipts in kind	
Pensions	Receipts	-
Remittances	(1) Cash received	(1) Cash remitted
	(2) Value of receipts in kind	(2) Value of remittances in kind
Non-agricultural household enterprise	Net receipts	(1) Cost on repair and maintenance of buildings allocated to non-agricultural household enterprise
		(2) Interest on loans for non-agricultural household enterprise
		(3) Miscellaneous non-direct cost.
Other sources	Net receipts	-

[1/] Only where cattle, goats, sheep, horses or pigs were kept.

Cost on buildings for maintenance and repairs was broken down in the raw data according to use for agricultural and non-agricultural purposes. Where use of buildings for non-agricultural purposes was reported, but no indication was given on the existence of a non-agricultural enterprise, cost on use of buildings was fully allocated to the agricultural enterprice. Cost on use of buildings in agricultural enterprise was distributed over crop production and animal husbandry on a fifty-fifty basis. If only poultry or no livestock at all was kept such cost was allocated to crop production only.

Cost on permanent labour was equally distributed over animal husbandry and crop production, if other livestock than poultry was kept.

Some items are intermediate between animal husbandry and crop production. These do not effect directly the level of output of the agricultural household enterprise as a whole, but should be considered while measuring the contributions of the two sub-sectors. The items are: own animal labour, own manure and own feed. In these cases the same value was applied where the item was included in the output as where it was included in the input. The price level was taken as if the item were sold or hired out.

Tool cost deducted from wages refers to some landless labourers who have to bring in certain tools while hiring themselves out for agricultural jobs. In the case of landed labourers the tool cost has been allotted to own crop production.

For non-agricultural household enterprises and "other" income sources net receipts have generally been computed immediately from the raw data or sometimes only net receipts were reported.

Income source in the Hills and the Terai

In the survey it was found that in a vast majority of the cases, the total net income of the household is derived from more than one of the above-mentioned sources. This is particularly true of the hills where it appeared that only 0.2 per cent of the households get all of their income from a single source. In the Terai the percentage of households depending on a single source is 9.8 and most of these households are landless.

The contribution of each source of income is summarized in Table 3.1 which shows the components of household income as well as per capita income in the survey villages for the two distinct territorial divisions.

Crop production constitutes the single most important source of income, both in the Hills and the Terai, and more particularly in the latter where it contributes more than all the other sources put together.

The most significant difference between the Hills and the Terai is noticed in the case of animal husbandry, which is the second most important source of income in the Hills but makes only a minor contribution in the Terai. Similarly, there is a significant difference in the relative importance of agricultural wages and salaries in the two areas; they constitute the second most important source of income in the Terai but are relatively less important in the Hills.

Non-agricultural wages and salaries make a sizeable contribution both in the Hills and the Terai, and more particularly the former. In either case, this is the third most important source of household income.

The contribution of non-agricultural household enterprise is relatively greater in the Terai, whereas pensions, remittances and other sources contribute relatively more in the Hills.

Table 3.1

Distribution by Source of Average Household Income and Per Capita Income in the Hills and the Terai

S. No.	Source of income	Hills				Terai			
		Household income		Per capita income		Household income		Per capita income	
		Rs.	Per cent of total	Rs.	Per cent of total	Rs.	Per cent of total	Rs.	Per cent of total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	Crop production	759.5	45.2	139.0	45.2	1366.6	57.0	240.1	57.0
2.	Animal husbandry	309.6	18.4	56.6	18.4	49.4	2.1	8.7	2.1
3.	Agricultural wages & salaries	163.1	9.7	29.8	9.7	479.9	20.1	84.3	20.1
4.	Non-agricultural wages & salaries	297.7	17.7	54.5	17.7	306.4	12.8	53.8	12.8
5.	Non-agricultural household enterprise	19.7	1.2	3.6	1.2	85.5	3.6	15.0	3.6
6.	Pensions	67.6	4.0	12.4	4.0	59.5	2.5	10.5	2.5
7.	Remittances	44.3	2.6	8.1	2.6	45.7	1.9	8.0	1.9
8.	Other sources	19.7	1.2	3.6	1.2	0.3	0.0	0.0	0.0
	All sources	1681.2	100.0	307.6	100.0	2393.3	100.0	420.4	100.0

As is shown in greater detail in annex 11 and 12 income structure varies widely from village to village and probably from district to district. As only two village panchayats per district were surveyed out of an average of 52 it cannot be assumed that the summary of results in the two villages reflects the district conditions. It should be noted that peculiarities in the income structure do not necessarily follow administrative boundaries and will be rather subject to local climatic, social, and economic conditions. Development regions may be divided into reasonably homogeneous-income-structure-areas that could be identified on the basis of data as presented here for a small sample only. Developmental activities can then be better adapted to the local scene.

Sources of income per strata

Table 3.2 and 3.3 summarize the data on the contribution that each source of income makes to household income of each of the five strata, in the hills and the Terai, respectively. Similar details relating to per capita income are presented in annex 13 and 14.

Landless households (belonging to stratum 0) naturally derive the bulk of their income from wages and salaries. However, there is a significant difference between the two areas, agricultural wages and salaries being the most important in the Terai and non-agricultural wages and salaries relatively more important in the Hills.[1/] Non-agricultural household enterprise also makes a contribution to the income of the landless, the more so in the Hills than in the Terai.

1/ Some caution has to be taken in comparing the results from the Hill landless with the Terai landless and other strata in the survey. The Hill landless were interviewed completely (only 12 households in the 4 Hill villages belonged to that category) while in the Terai a sample (of 77 households) has been interviewed out of a total of 621 enumerated households in the landless category.

Table 3.2

Distribution by source of Income within each stratum in the hills

S. No.	Source of income	Stratum 0		1		2		3		4		All strata	
		NRs.	%of total	NRs.	%of total	NRs.	%of total	NRs.	%of total	NRs.	%of total	NRs.	%of total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	Crop production	0.0	0.0	381.0	30.2	1011.2	51.0	1677.7	66.2	2126.2	64.3	759.5	45.2
2	Animal husbandry	-73.3	N[1/]	264.1	21.0	342.3	17.2	357.3	14.1	560.5	16.9	309.6	18.4
3	Agricultural wages & Salaries	100.0	10.6	165.4	13.2	197.6	9.9	122.8	4.8	64.7	2.0	163.1	9.7
4	Non-agricultural wages & salaries	436.7	46.2	351.8	28.0	200.8	10.1	175.8	6.9	319.2	9.6	297.7	17.7
5	Non-agricultural household enterprise	209.1	22.1	13.9	1.1	19.2	1.0	51.8	2.0	19.6	0.6	19.7	1.2
6	Pensions	0.0	0.0	40.7	3.2	111.7	5.6	16.9	0.7	200.0	6.0	67.6	4.0
7	Remittances	200.0	21.1	37.3	3.0	45.5	2.3	112.9	4.4	9.6	0.3	44.3	2.6
8	Other sources	0.0	0.0	3.8	0.3	58.4	2.9	23.5	0.9	9.9	0.3	19.7	1.2
	All sources	872.5	100.0	1258.0	100.0	1986.7	100.0	2538.7	100.0	3309.7	100.0	1681.2	100.0

1/ N = Negative
The net contribution of source No. 2, which is negative for stratum 0, is shown in col. 3 but is omitted while calculating the percentage distribution in col. 4.

Table 3.3

Distribution by Source of Income within each stratum in the Terai

S. No.	Source of income	Stratum								All strata	
		NRs.	%of total	NRs.	%of total	NRs.	%of total	NRs.	%of total	NRs.	%of total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	Crop production	0.0	0.0	167.7	12.1	442.2	31.2	1192.4	54.9	3635.8	82.3	1366.6	57.0
2	Animal husbandry	-80.2	N[1/]	-16.4	N[1/]	32.9	2.3	8.2	0.4	232.4	5.3	49.4	2.1
3	Agricultural wages and salaries	997.2	71.4	880.2	63.1	472.8	33.4	308.1	14.2	48.2	1.1	479.9	20.1
4	Non-agricultural wages and salaries	265.4	19.0	152.2	11.0	242.7	17.1	345.9	15.9	397.0	9.0	306.4	12.8
5	Non-agricultural household enterprise	134.3	9.6	180.6	12.9	171.6	12.1	43.8	2.0	1.5	0.0	85.5	3.6
6	Pensions	0.0	0.0	9.9	0.7	55.7	3.9	177.5	8.2	21.3	0.5	59.5	2.5
7	Remittances	0.0	0.0	0.0	0.0	0.0	0.0	95.4	4.4	79.6	1.8	45.7	1.9
8	Other sources	0.0	0.0	2.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
	All sources	1316.7	100.0	1376.9	100.0	1417.9	100.0	2171.3	100.0	4415.8	100.0	2393.3	100.0

1/ N = Negative

The net contribution of source No. 2, which is negative for strata 0 and 1, is shown in cols. 3 and 5 but is omitted while calculating the percentage distributions in cols. 4 and 6.

A notable feature of the landless households is that, although a considerable percentage of them, viz. 33.3 per cent in the Hills and 42.5 per cent in the Terai, try to supplement their income from animal husbandry, the net contribution of this source is negative for this group of households, both in the Hills and in the Terai. This feature could be clarified to some extent if we look at the allocation of feed cost. Very big quantities of by-products from crop production have been reported as feed given to livestock. To remain within reasonable limits only the value of the by-products produced on the own farm has been deducted. For the landless households this was not possible. Another point is that manure produced has not always been indicated. Whereas in the case of landed households data on the use of manure could fill in this gap this could not be done with the landless. These considerations about the quality of the data may explain part of the very negative results with animal husbandry among the landless. But it does definitely not explain all as stratum 1 in the Terai also shows a negative contribution from livestock (see below). A detailed study on the possibilities of the landless to increase their income with animal husbandry may throw more light on this matter.

Households belonging to stratum 1 in the Terai [1] are rather similar to the landless since they too derive the bulk of their income from agricultural wages and salaries, the contribution from crop production being only 12.1 per cent of their total net income. However, in the Hills, there is a significant difference between stratum 1 [2] and stratum 0.

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[1] Each household owning upto 0.34 hectare of gross cultivable land, assuming irrigated area to have a double production potential.

[2] Each household owning upto 0.20 hectare of gross cultivable land, assuming irrigated area to have a double production potential.

For one thing, households belonging to stratum 1 in the Hills derive more income from crop production than from non-agricultural wages and salaries which is the most important source for the landless households in the Hills. Secondly, animal husbandry becomes an important source of net positive income for the households belonging to stratum 1 in the Hills. This is significant since the net income from animal husbandry continues to be negative for the households belonging to stratum 1 in the Terai. Thirdly, there is a change in the relative importance of non-agricultural household enterprise. In the Hills, this source of income is important only for the landless, its contribution for stratum 1 being only 1.1 per cent of the total net income. However, in the case of the Terai, it is in stratum 1 that the non-agricultural household enterprise contributed more to household income than in any other stratum.

Households belonging to strata 2,3 and 4 [1/] in the Hills have incomes above the average of all the Hills strata. The relative importance of the various sources of income is also similar in these three strata. Crop production contributes more than 50 per cent of the total net income of each of these strata. Animal husbandry is the second most important source, followed by non-agricultural wages and salaries.

In regard to the order of importance of the three most important sources, viz. crop production, animal husbandry and non-agricultural wages and salaries, strata 2,3 and 4 in the Hills resemble the average for all the Hills strata, the situation in strata 0 and 1 being different as already noted.

[1/] The area available to the household for cultivation increases from stratum 2 to stratum 4, each household belonging to stratum 4 having 0.62 hectare or more in the Hills and 1.70 hectares or more in the Terai.

In the Terai, the relative importance of the various sources of income shows a greater degree of variation from stratum to stratum than in the Hills. For example, the order of importance of the three most important sources of income is different in each stratum. Furthermore, none of the strata is, in this respect, similar to the average of all the Terai strata.

In the Terai, the relative position of stratum 2 vis-a-vis the other strata is in sharp contrast to that in the Hills. Households belonging to stratum 2 in the Terai have an income much below the average for all the Terai strata. In fact, their per capita income is practically the same as that of households belonging to the Terai strata 0 and 1. They too derive a large part of their income from agricultural wages and salaries, which contribute more than crop production. Non-agricultural wages and salaries constitute the third most important source of their income. Animal husbandry, also starts making a net positive contribution in the Terai stratum 2, but its share is only 2.3 per cent of the total net income of this stratum.

In the Hills, the average income of all the strata is crossed as soon as we move from stratum 1 to stratum 2. This does not happen in the Terai even upto stratum 3 which continues to have an income below the average of all the Terai strata [1/]. Nevertheless, the two most important sources of income are the same in the Terai strata 3 and 4. The contribution of crop production is as high as 54.9 per cent of the total net income in stratum 3 and it rises still further to 82.3 per cent in stratum 4. Non-agricultural wages and salaries constitute the second most important source, contributing 15.9 per cent of the income in stratum 3 and 9.0 per cent in stratum 4. In fact, since the average household income from all sources in stratum 4 is more than twice the corresponding average in stratum 3, the contribution of non-agricultural wages and salaries to household income, in terms of absolute figures, is higher in stratum 4 than in stratum 3.

[1/] Strata 0 and 1 in the Hills represent 59.9% of the population while strata 0-3 in the Terai encompass 73.0% of the population. It should be noted that part of the phenomenon revealed is due to an unequal size of strata.

A major difference between these two Terai strata is that agricultural wages and salaries constitute the third most important source of income in stratum 3 while animal husbandry assumes this role in stratum 4.

One aspect of the variety in income sources is the possibility for farmers to supplement low incomes caused by shortage of land available for cultivation. We may examine the elements in the household income that play a compensating role in this respect. Table 3.4 and 3.5 show the relative level of income of the landed strata for different sources or pooling of sources of household income.

Table 3.4

Stratum indices of net income per household for different sources, Stratum 1 = 100, HILLS.

Strata	1	2	3	4
Crop production	100	265	440	558
Animal Husbandry	100	130	135	213
Agricultural wages and salaries	100	119	74	39
Non-agr. wages and salaries	100	57	50	91
Other sources	100	245	214	250
Household	100	158	202	263

Table 3.5

Stratum indices of net income per household for different sources, stratum 1 = 100, TERAI

Strata	1	2	3	4
Crop production	100	263	710	2,164
Animal Husbandry	N[1/]	100	24	703
Agricultural wages and salaries	100	54	35	5
Non-agr. wages and salaries	100	159	227	261
Other sources	100	118	164	53
Household	100	104	159	323

1/ N = negative. Here stratum 2 is taken as 100.

In the Hill households compensating effects are most prominent from salaries and wages. Also animal husbandry contributes somewhat to a more favorable income distribution over the strata as its indices are lower than those for crop production. This factor is particularly prominent in the villages of Syangja district. "Other sources" are rather insignificant and clearly do not contribute much to alleviate the drawback of a small land-holding.

Crop production in the Terai households causes a very wide range of income levels as a result of bigger differences in size of land holdings. Animal Husbandry has an additional reverse effect as its contribution in stratum 1 is even negative. Agricultural wages and salaries contribute most to compensate for a small landholding. Also "other sources" where non-agricultural household enterprise plays an important role do help to compensate for otherwise low incomes. Non-agricultural wages and salaries make also a minor contribution although there is a tendency for the bigger farm families to earn more of them.

Sources of income, top and bottom deciles

The surveyed households have been arranged in an ascending order of income, in the Hills and the Terai separately, according to two different measures, viz. (i) household income and (ii) per capita income. The two orderings are different because of variations in the size of the household. Special attention is focussed here on the bottom 30 per cent and the top 30 per cent of the households, and within these on the poorest 10 per cent and the richest 10 per cent. Table 3.6 and 3.7 summarize the data on the contribution that each source of income makes to household income of these groups of households, in the Hills and the Terai, respectively. Similar details relating to per capita income are presented in annex 15 and 16.

Table 3.6

Distribution by Source of Income of the Bottom 10% and 30% and the top 10% and 30% of Households in the Hills

S. No.	Source of income	Bottom 10%		Bottom 30%		Top 30%		Top 10%		All households	
		NRs.	Per cent of total	NRs.	Per cent of total	NRs.	Per cent of total	NRs.	Per cent of total	NRs.	Per cent of total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	Crop production	59.9	35.2	246.3	54.4	1399.7	41.3	1815.5	33.8	759.5	45.2
2	Animal husbandry	-74.3	N[1/]	15.5	3.4	760.9	22.4	979.6	18.2	309.6	18.4
3	Agricultural wages and salaries	82.4	48.3	128.1	28.3	121.2	3.6	135.8	2.5	163.1	9.7
4	Non-agricultural wages and salaries	17.2	10.1	36.2	8.0	736.2	21.7	1595.2	29.6	297.7	17.7
5	Non-agricultural household enterprise	10.8	6.4	8.8	1.9	27.3	0.8	34.2	0.6	19.7	1.2
6	Pensions	0.0	0.0	13.9	3.1	155.2	4.6	439.6	8.2	67.6	4.0
7	Remittances	0.0	0.0	0.0	0.0	133.2	3.9	359.1	6.7	44.3	2.6
8	Other sources	0.0	0.0	3.9	0.9	56.5	1.7	21.2	0.4	19.7	1.2
	All sources	96.0	100.0	452.7[2/]	100.0	3390.2	100.0	5380.2	100.0	1681.2	100.0

1/ N = Negative

2/ The difference with table 2.3.a arises because in that table negative total incomes have been set at zero. The net contribution of source No. 2, which is negative for the bottom 10% of households, is shown in col. 3 but is omitted while calculating the percentage distribution in col. 4.

Table 3.7

Distribution by Source of Income of the Bottom 10% and 30% and the Top 10% and 30% of Households in the Hills

S. No.	Source of income	Bottom 10%		Bottom 30%		Top 30%		Top 10%		All households	
		NRs.	Per cent of total	NRs.	Per cent of total	NRs.	Per cent of total	NRs.	Per cent of total	NRs.	Per cent of total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	Crop production	-338.3	N[1]	166.9	35.7	3724.9	67.5	6893.1	73.9	1366.6	57.0
2	Animal husbandry	-179.5	N[1]	-115.3	N[1]	261.7	4.7	99.0	1.1	49.4	2.1
3	Agricultural wages and salaries	130.9	73.7	206.3	44.0	383.8	7.0	177.6	1.9	479.9	20.1
4	Non-agricultural wages and salaries	41.4	23.3	76.6	16.4	661.0	12.0	1450.1	15.6	306.4	12.8
5	Non agricultural household enterprise	5.4	3.0	13.4	2.9	177.8	3.2	242.7	2.6	85.5	3.6
6	Pensions	0.0	0.0	4.6	1.0	181.7	3.3	120.4	1.3	59.5	2.5
7	Remittances	0.0	0.0	0.0	0.0	121.5	2.3	332.7	3.6	45.7	1.9
8	Other sources	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
	All sources	-340.1	100.0	352.5[2]	100.0	5518.4	100.0	9315.6	100.0	2393.3	100.0

1/ N = Negative

2/ The difference with table 2.3.a. arises because in that table negative total incomes have been set at zero. The net contributions of sources 1 and 2 which are negative for the bottom 10% of households, are shown in col. 3 but are omitted while calculating the percentage distribution in col. 4. Similarly, for the net contribution of source 2 in cols. 5 and 6.

In the ordering based on per capita income, the households belonging to most of the deciles have rankings that differ significantly [1/] from those based on household income. However, with one exception such a re-arrangement has no major impact on the relative importance of the sources of income of the households belonging to the top and bottom groups on which attention has been focussed in the present discussion.

The exception is the case of the bottom 10% households in the Hills. If the group is taken according to level of household income the major source of income is agricultural wages and salaries while crop production comes in the second place. This is exactly the reverse if the group is taken according to per capita income (see table 3.8)

Table 3.8

Sources of income of bottom 10% Hill households according to household income (H) and to per capita income (C) (%)

Sources	Crop prod.	Animal Husb.	Agricult. Wages and Sal.	Non-agri. Wages and Sal.	Non-agri. HH. enterpr.	Pen-sions	Remit-tances	Others	Total
H	35.2	N*	48.3	10.1	6.4	-	-	-	100
C	70.1	N*	16.1	7.9	5.1	-	-	0.8	100

N* = Negative, see footnotes to table 3.6 and 3.7 and annex 15 and 16

[1/] The coefficient of rank correlation, between the rankings of households in the two orderings, one based on per capita income and the other based on household income, is very small in most of the deciles.

Such a significant difference between the two orderings arises from a variation in the size of the households that depend mainly on two sources, viz. (i) crop production and (ii) agricultural wages and salaries.

Hill households deriving the bulk of their income from agricultural wages and salaries are generally among the poorest according to household income, but their relatively small size improves, to a certain extent, their position in terms of per capita income and moves several of them upwards from the bottom decile based on per capita income. Their place in the bottom decile in the Hills is taken by households that depend mainly on crop production from small farms and who possess the following two characteristics, viz. (i) their household income is higher than that of the poorest 10 per cent and (ii) they have a relatively large size which pushes their per capita income down to the level of the poorest 10 per cent according to per capita income. In a separate calculation we found that in the Hill as well as in the Terai villages there was no marked difference in relative contributions of the sources of income as the size of the family changes. That is why it was not surprising that the shift in income sources did not appear with the bottom 30% of the households. We must therefore conclude that the above situation is rather accidental. If family size has no impact on income structure, ranking of households on the basis of household income and on the basis of per capita income yields the same results on relative contribution of income sources. What the above analysis does illustrate is that if we focus attention on a small target group like the 10% poorest in a community it matters very much how it is defined.

So, in the Hills, the principal source of income of the poorest households depends on where the line is drawn to identify such households. For the bottom 10 per cent of the households in an ordering based on household income, the principal source of income is agricultural wages and salaries, supplemented by crop production. However, for the bottom 30 per cent taken together, crop production is the main source of income and agricultural wages and salaries come next in importance.

The net contribution of animal husbandry is negative for the poorest 10 per cent; this becomes positive, but is still small, for the poorest 30 per cent. Non-agricultural wages and salaries also make a contribution to the income of the poorest households in the Hills, but this is less than the corresponding contribution in the Terai.

In the Terai, the poorest of the households derive their income largely from agricultural wages and salaries. This is particularly true of the bottom 10 per cent. More than three-fourths of the poorest households, considering either the bottom 10% or the bottom 30%, are engaged in crop production and animal husbandry also. However, animal husbandry fails to yield a net positive income to the poorest 10 per cent as well as to the poorest 30 per cent. The net income from crop production is negative for the poorest 10 per cent but becomes positive for the poorest 30 per cent. Non-agricultural wages and salaries also make a sizeable contribution to the income of the poorest households in the Terai.

The richest of the households, in the Hills as well as in the Terai derive their income largely from crop production and to a lesser extent from non-agricultural wages and salaries. Crop production is particularly important in the Terai where it accounts for 73.9 per cent of the income of the top 10 per cent of the households. In the Hills, non-agricultural wages and salaries contribute only a little less than crop production, the two sources taken together accounting for 63.4 per cent of the income of the top 10 per cent of the households. Animal husbandry and pensions are also important to these Hill households, but the role of these two sources for the richest of the Terai households is insignificant.

4. Household Income from Agricultural Enterprise

Families [1/] that cultivate land or keep livestock whether owned or rented from other families and do this on own account, engage by definition in agricultural economic activities as a household enterprise. These activities can be classified in two categories: 1. Crop production, and 2. Animal Husbandry. In Nepalese families where agricultural production is still largely traditional and geared to self-sufficiency, crop production and animal husbandry are generally undertaken simultaneously. In fact, where only one of the two is practiced it is not because of advantage of specialisation but because of lack of assets required. Under prevailing Nepalese conditions a farmer will strive for a mixed farming system to acquire self-sufficiency for the whole of his family's diet. From table 4.1 it appears that the large majority of farming families actually engages in mixed farming. 0.3% of the Hill households and 11.9% of the Terai households are not engaged in agricultural household enterprise at all. They may however earn wages out of agriculture.

Table 4.1 Incidence of agricultural household enterprise.

Households with agricultural enterprise (weighted percentage of total) engaged in:	Hills	Terai
Crop production and animal husbandry	95.5	71.6
Crop production only	3.9	5.2
Animal husbandry only	0.3	11.2
No agr. hh. enterprise	0.3	11.9
Total	100	100

1/ "Family" and "household" are used interchangeably.

Crop Production and Livestock

The relative contribution of crop production and animal husbandry to income from the agricultural household enterprise differs considerably according to location. (see table 4.2)

Table 4.2 Relative contribution from crop production and animal husbandry to household income from the agricultural household enterprise according to location (%)

Location	1+2*	7+8*	Hills	3+4*	5+6*	Terai
Crop Production	85.4	56.2	71.1	97.5	96.3	96.5
Animal Husbandry	14.6	43.8	28.9	2.5	3.7	3.5
Total	100	100	100	100	100	100

* see for codes of location p.6

In the survey villages of Syangja district almost half of the agricultural enterprise net income is derived from livestock whereas in the Terai villages the income from livestock is negligible. The general observation that returns from animal husbandry constitute an important ancillary income in the Hills is confirmed here. It does not mean that the livestock inventory in the Terai is much smaller. It is in fact almost equal in value to that of the Hill villages, NRs 915 to NRs 964 per household (see table 4.3). However the productivity of livestock in the Terai is much lower than in the Hills.

From a ranking of households according to per capita family income it appears that the higher brackets derive relatively more of their agricultural enterprise income from livestock.

Table 4.3 Value of per household livestock inventory at the time of the survey, weighted average (NRs)

Location	Strata					
	0	1	2	3	4	All
Hills	51	640	1184	1730	2165	964
Terai	119	267	405	740	2270	915

Conversely we find here that the poorer sections of the village population depend almost entirely on crop production as far as income from the agricultural household enterprise goes. (see table 4.4)

Table 4.4 Relative contribution of crop production and animal husbandry to income from agricultural household enterprise according to decile of per capita household income (%)

Deciles	1	2	3	4	5	6	7	8	9	10
Hill villages										
Crop production	100.0	95.1	81.1	74.7	77.3	80.7	69.4	67.5	61.5	62.5
Animal Husbandry	-	4.9	18.9	25.3	22.7	19.3	30.6	32.5	38.5	37.5
Terai villages										
Crop Production	-*	100.0	100.0	100.0	84.4	89.2	90.8	80.8	91.4	100.0
Animal Husbandry	-*	-	-	-	15.6	10.8	9.2	19.2	8.6	-

* The lowest 10% per capita income households in the Terai villages did not derive any income from agricultural enterprise.

Cost and Return of Crop Production

The gross income from crop production is the total value of main- and by-products of crops grown during the reference period i.e. the last wet season and the last dry season for which results were available at the time of enquiry. The main products generally consist of seeds in the case of cereals and pulses. They may be tubers, cane, fibers, etc. The main by-product is straw. Annex 17 gives the list of crops found in the survey. The value of the products from crop production is composed of two elements, the physical output in weight or other units and the price per such unit. To know the gross income from crop production information on both elements has to be collected for both types of products. As the by-products contribute only a minor part to crop income physical output figures were not retained. Moreover, the units in which this information was given varied considerably with location and was difficult to convert into uniform units of measurement. However, for the main products physical output per area unit cultivated could be more easily computed in uniform units and it represents an important yardstick of productivity in crop production. The larger part of the cropped area is under single crops. Where two crops are grown simultaneously, generally interplanted, these have been treated as one crop as it would be impossible to allocate direct cost like manure, fertilizer or water charges appropriately. One such mixed crop has been reported on a considerable scale particularly in the villages of Kabhre district. It is a maize crop interplanted with soyabeans. It has therefore been included in tables 4.5 on yields.

Table 4.5 shows that yields in the Hills are much higher than those in the Terai. Wheat is an exception with low yields in both locations. An interesting aspect is the higher yield of maize if grown with soyabeans. This is presumably caused by the nitrogen generating capacity of soyabeans from which the maize crop has benefited.

Table 4.5 Average yield and percentage distribution of selected crops, Hills and Terai.

Crops		Paddy	Wheat	Maize	Maize with Soyab	Millet	Other	Total
Hills	Average yield (kg/are) (a)	25.8	7.6	21.0	26.9/6.3	27.7	-	-
	Percentage distribution (a)	23.7	18.0	25.6	16.2	8.1	8.3	100
	(b)	24.9	19.0	28.7	16.2	9.9	1.2	100
Terai	Average yields (kg/are) (a)	10.7	6.1	4.3	-	4.1	-	-
	Percentage distribution (a)	52.9	13.8	9.9	-	2.8	20.6	100
	(b)	55.3	14.3	9.9	-	2.8	17.7	100

(a) Excluding plots where other crops were interplanted

(b) Including plots where other crops were interplanted

The major crop in the Hill villages appeared to be maize. In the Terai it was found to be paddy. The cropped area in the Hills was relatively evenly distributed over paddy, wheat, maize, maize with soyabeans and millet with or without an interplanted crop. In the Terai villages the cropping pattern as a whole appeared to be more dominated by the major crop of paddy while a big number of other crops (pulses, tubers, etc.) occupying 18 percent of the harvested area were grown apart from the crops mentioned here. It was found that the cropping pattern observed in the survey did not tally with the broad pattern as found in the agricultural census so that the selection of households in the eight villages could not be taken as representative in this respect for the whole of the Western and Central development regions (see table 4.6)

Table 4.6 Cropping pattern in Survey and in the whole of the Western and Central development regions. (% of total cropped area)

	Survey		Central and Western region
	including plots with interplanted crops	excluding plots with interplanted crops	Census 1/
Paddy	51.5	49.2	52.9
Maize	14.3	11.9	21.0
Wheat	14.9	14.3	10.9
Millets	3.7	3.5	6.0
Others	15.6	21.1	9.1
Total	100	100	100

1/ Computed from Agricultural Statistics, Ministry of Food and Agriculture, Kathmandu. Geographical coverage of regions as on p.18 of this publication.

The cropping pattern does not influence Hill-Terai differentials very much as these are highly dominated by the gap in yields. Within these broad regions it may very well play a role and also particularly from farm to farm.

Crop yields vary not much stratumwise. Only in the Hills a considerable drop in productivity per area unit in the highest stratum is suggested by the figures. In the Terai there is even a slight tendency of lower yields among smaller landholders (see table 4.7).

Table 4.7 Stratumwise average yields (kg/are)

Crop*	Location	Stratum** 1	2	3	4	All strata
Paddy	Hills	24.1	28.0	28.5	23.5	25.8
Wheat	Hills	10.7	8.4	6.9	5.8	7.6
Maize	Hills	25.1	27.2	22.7	13.3	22.0
Maize/soyabeans	Hills	33.2/8.9	28.4/6.3	31.4/5.3	15.6/4.2	26.9/6.3
Paddy	Terai	10.1	10.4	11.4	10.5	10.7
Wheat	Terai	4.9	5.8	5.9	6.2	6.1

* Only crops covering more than 10% of cropped area in this location.

** See for stratum boundaries table 1.4.

It is rather futile to elaborate on differences in yields among sizes of landholdings while the majority of the holdings is still very small especially in the Hills where the variation in yields appears to be somewhat more significant. The attention with respect to yields should rather be focussed on the marked difference between Hill and Terai crop production. The difference is so big that this cannot be accounted for by differences in soil fertility only. Wheat is grown in the winter season and as in many cases water supply is uncertain at that time then this may lead to minimum investment on labour and other inputs in this crop so that after a hazardous growth its yield cannot be expected to be high. It is conceivable that this risk factor operates the same way in both the Terai and Hill conditions and may explain the similar low yield of wheat in these locations. However, the other crops are largely grown in the wet summer season when water supply is more assured. A considerable part of the difference in yield will be due to a difference in farm practices like use of manure, leveling of land, weeding, planting pattern etc. Hill agriculture to a great extent proves that Terai cropping can be much more productive. In the remaining part of this para we will examine various aspects of cost and returns in crop production to investigate the structural differences of this activity between the Hills and the Terai.

Table 4.8 Returns from crop production per area unit harvested (Rs/ha)

		Stratum 1	2	3	4	All strata
Hills	Gross income 1/	4335	3919	3713	2581	3664
	Household income 2/	2764	2686	2591	1647	2402
Terai	Gross income	1231	1170	1270	1186	1201
	Household income	761	652	893	748	771

1/ Value of main and by-products from crop production.

2/ Gross income minus all cost on crop production except for family labour and family capital

The results of crop production per area unit harvested in terms of money show differentials similar to those found on yields (see table 4.8). Price differentials do not exert a great influence. In annex 18 average prices are presented on maize in the Hills and paddy in the Terai as reported in the survey. The somewhat more marked variations in price according to location will reflect the relative scarcity of the grains in these different areas. Gross income in the Hills per ha of cropped area is about three times

as high as in the Terai while the ratio is even higher if we consider household income. There is some indication that for smaller landholdings the gap between returns from crop production per area unit harvested in the Hills and the Terai is even higher than for the average. In the Hilly areas farmers with the lowest production potential, land combined with irrigation facilities, squeeze out relatively more per area unit harvested using more labour and particularly using more manure and fertilizer. Hill farmers in the survey used six to seven times more manure and fertilizer per area unit than Terai farmers. Their operating cost including the use of own draught animals but not their family labour is almost three times as high. This is largely hired labour cost which means that in addition to an already higher family labour input (see table 4.8a) the Hill farmer hires more labour days for his cropping operations. (see table 4.9 and 4.10).

Table 4.8a Number of adult equivalent family workers per ha harvested in households with agriculture as their sole enterprise.

Strata	1	2	3	4	all
Hills	11.8	8.4	5.9	3.3	7.5
Terai	4.1	2.1	1.3	0.5	0.8

Table 4.9 Cost structure on crop production (Rs/ha harvested)

Cost item	Location	Stratum 1	2	3	4	all
Manure and fertilizer	Hills	400	339	226	154	286
	Terai	33	50	23	47	43
Seed and other direct cost 1/	Hills	119	123	108	86	109
	Terai	81	97	82	92	90
Total direct cost	Hills	519	462	334	240	395
	Terai	114	147	105	139	133
Operating cost 2/	Hills	904	737	705	630	745
	Terai	337	318	240	266	264
Other non-direct cost 3/	Hills	148	34	83	64	122
	Terai	19	53	32	33	33
Total non-direct cost	Hills	1052	771	788	694	867
	Terai	356	371	272	299	297
Total cost	Hills	1571	1233	1122	934	1262
	Terai	470	518	377	438	430

1/ Other direct cost includes cost on pesticides, water charges and the value of rents paid.

2/ Operating cost includes cost on hired animal and human labour, value of the use of own animal labour, cost on tools and equipment used.

3/ Other non-direct cost includes cost on land improvement, interest on crop production loans paid and cost on buildings used for crop production.

From table 4.10 we can see also that the Terai casual labourer in agriculture gets Rs 1 more than his Hills counterpart.

For the Terai there is no marked difference in cost structure according to stratum. In the Hills however the lower strata clearly tend to use more manure, fertilizer and hired labour than the higher strata of households. Thus, in stratum 1 in the Hills the value of nutrients added is even nine times as much as the average value of nutrients applied in the Terai.

The high level of "other non-direct cost" in the Hills (table 4.9) will be due to a high expenditure on land improvement as terraces have to be put up regularly. The high operating cost in the Hills has several other possible causes. They are: more time consuming tilling of the land on smaller and sloping plots, obviously additional labour used on application of manure and fertilizer, farmers may do more weeding than in the Terai and additional labour needed for bigger harvest per area unit.

Table 4.10 Hired casual labour for crop production

Stratum		1	2	3	4	all
Days per ha harvest,	Hills	104	101	93	114	104
	Terai	27	29	23	32	30
NRs per ha harvest,	Hills	392	382	346	381	379
	Terai	120	137	111	148	140
NRs per day	Hills	3.77	3.78	3.72	3.34	3.64
	Terai	4.44	4.72	4.83	4.63	4.67

As analysed here the cost structure in Hills and Terai looks pretty much the same taken all strata together. Direct cost constitutes just over ten percent of gross income while non-direct cost remains just below 25% of gross income. The result is that out of the gross value of crop production roughly 65% remains as a remuneration to farmers and their households, not only for their labour but also for the capital they brought into the enterprise. (see table 4.11)

In the data there is little evidence on economies of scale which would mean that non-direct cost as defined here would be lower in higher strata of the sample. An exception is stratum 1 in the Hills where it seems that the disadvantage of a very small landholding leads to relatively high non-direct costs of NRs 1052 per ha. harvested. The household income from crop production in this stratum is however still higher than for ther other Hill strata as these higher costs are easily offset by a higher gross income. This lack of economies of scale points to the situation where the non-direct cost consisting largely of hired casual labour can in fact be adjusted to a great extent to the production level. However if an imputed cost for family labour would have been included the economies of scale would come out as family labour is a less flexible non-direct cost item. Also keeping a pair of bullocks is an inflexible cost item but in our analysis this will burden the animal husbandry results as the cost and returns on the use of own draught animals were imputed on the basis of a hiring rate per time period of use. As no bigger farms draught animals can be more fully utilised and the returns to the animal husbandry sector at the farm will be higher than on small farms.

Table 4.11 Crop production cost and returns per ha harvested, Hills and Terai (NRs and perc)

Cost and returns	Strata 1		2		3		4		all	
			Hills							
	NRs	perc	NRs	perc	NRs	perc	NRs	perc	NRs	perc
Gross income 1/	4335	100	3919	100	3713	100	2581	100	3664	100
Direct cost 2/	519	12.0	462	11.8	334	9.0	240	9.3	395	10.8
Non-direct cost 2/	1052	24.3	771	19.7	788	21.2	694	26.9	867	23.7
Household income 1/	2764	63.8	2686	68.5	2591	69.8	1647	63.8	2402	65.6
			Terai							
Gross income 1/	1231	100	1170	100	1270	100	1186	100	1201	100
Direct cost 2/	114	9.3	147	12.6	105	8.3	139	11.7	133	11.1
Non-direct cost 2/	356	28.9	371	31.7	272	21.4	299	25.2	297	24.7
Household income 1/	761	61.8	652	55.7	893	70.3	748	63.1	771	64.2

1/ See footnotes table 4.8

2/ See footnotes table 4.9

So far, all cost and returns have been looked at per area unit harvested. This means that double cropping has been eliminated as single factor influencing the returns from a given area of land which is generally taken as farm size or cultivated area. Also in stratifying the survey sample according to "farm size" we have taken out the influence of irrigation facilities being available reasoning that such facilities in fact double the size of the farm over the area concerned. Size of farm as we have defined it refers rather to a production potential. Grade of land has not been taken into account as it was difficult to assess differences in production potential as a result of differences in land quality. It is felt that within a limited area the price of different grades of land may be a suitable weight for its production potential and thus may be used in subsequent surveys. In table 4.12 we can find figures on production potential (cultivated area + irrigable area) ÷ (cultivated area) as well as on actual cropping intensity (harvested area ÷ cultivated area). While the Hill farms apparently

Table 4.12 Potential cropping intensity (I) and actual cropping intensity (II). 1/

Strata		1	2	3	4	all
Hills	(I)	1.07	1.11	1.12	1.24	1.14
	(II)	1.50	1.39	1.46	1.43	1.44
Terai	(I)	1.07	1.18	1.30	1.37	1.34
	(II)	1.24	1.41	1.44	1.38	1.39

1/ (I) = (cultivated area + irrigable area) ÷ cultivated area
(II) = harvested area ÷ cultivated area

avail of irrigation facilities on a smaller area than Terai farms in the survey the incidence of actual double cropping in the Hills appears to be higher. As we have seen that the average returns per ha harvested in the Hills are still much higher than those in the Terai we can say that double cropping without irrigation facilities in the Hills appears to yield reasonably satisfactorily.

While there is a tendency for the farms with a bigger production potential to have a relatively bigger area under irrigation facilities both in the Hills and in the Terai the actual cropping intensity does not seem to be consistently related to farm size. Small farms apparently try to increase their production by double cropping under conditions of non-assured water supply.

Regression analysis on crop income

A linear multiple regression was carried out to find the factors influencing the level of net crop income for Terai and Hill households with crop income separately. The following explanatory variables were considered:

(i) direct cost on crop production per area unit harvested
(ii) ratio of area harvested over area cultivated
(iii) area cultivated
(iv) index of cropping pattern (see annex 18a)
(v) operating cost per area unit harvested
(vi) other cost per area unit harvested (see table 4.9)
(vii) percentage of net household enterprise income out of the crop production
(viii) cropping intensity (= harvested area ÷ cultivated area)
(ix) irrigated area
(x) number of adult equivalent workers available for household enterprises

The resulting best fitting equations were:

Terai

$$Y = -1808 - 1.17X_1 + 9.29X_2 + 8.11X_3 + 949X_4$$
$$(-1.710)\quad (3.417)\quad (4.000)\quad (22.481)$$

$R^2 = 0.743$

$F = 131.57$

$n = 187$

Y = Net crop income in NRs.

X_1 = Direct cost on crop production per Ha harvested in NRs.

X_2 = Index of cropping pattern

X_3 = Cropping intensity in percentages

X_4 = Cultivated area in Ha.

Hills

$$Y = 24 + 1971X_1 - 0.075X_2 + 182X_3$$

$$(10.939) \quad (-1.947) \quad (5.501)$$

$R^2 = 0.588$

$F = 99.41$

$n = 213$

Y = Net crop income in NRs.

X_1 = Cultivated area in Ha

X_2 = Operating cost per Ha harvested in NRs.

X_3 = Number of adult equivalent workers available for household enterprises

Under the coefficients in the equations t-values are given. The coefficient of X_1 in the Terai equation is significant at 90% level of probability whereas all other coefficients are significantly different from zero at a 95% probability level. The R^2's indicate that for the Terai the variables explain 74% of the variation whereas for the Hills they explain only 59%. R^2's are clearly different from zero as indicated by significant values of F.[1/]

In both equations the area cultivated explains of course a part of the variation in net crop income. It is, however, clear that an additional Terai Ha delivers much less income than an additional Hill area of similar size, i.e. NRs. 949 as against NRs. 1971. As the average net crop income per Ha is NRs.771 and NRs. 2402 respectively it means that marginal return in the Terai is larger than average returns whereas the opposite is true in the Hills. This suggests that impact of land reform on total production in the Hills will be positive whereas it will be negative in the Terai.

It is striking that both equations show a negative impact of cost components on net income. In the Terai a one NRs. increase in direct cost per Ha harvested brings net income down by NRs. 1.17 whereas in the Hills operating costs being increased by NRs. 1,000 would lead to a NRs. 75 drop in net income. Other cost components in the respective areas did not show any relationship. The results here point at a high level of inefficiency in crop production which may be caused by invalidity of input recommendations

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1/ For a brief explanation on the range over which coefficients could still vary at a certain probability level see p.27. .

or at least their faultiness. If Terai crop farmers tend to loose NRs. 1.17 per each additionally spend NRs. on inputs and additional labour (human and animal) and equipment utilization in the Hills leads to losses in net crop income rather than to gains there is something basically wrong with the management of these farms. Additional adult equivalent workers in the household available for work in household enterprises yield an additional NRs.182 of net crop income per unit. This is very low taking into account a daily agricultural wage of NRs.2-3 with food in addition. In fact hired labour and other operational inputs purchased and applied in crop production on the farm pay off relatively well.

The factors X_2 and X_3 in the Terai equation point to possibilities for improvement of the crop income situation through changes in the cropping pattern and increase in double cropping. A Ha. extra of double cropping may yield NRs.811 in the Terai whereas the cultivation of relatively more rice and,maybe, wheat there, can also augment the net crop income.

Cost and returns to livestock

It has been reported so far that Hill farmers supplement their household income from crop production with a considerable contribution from animal husbandry. In the Terai the importance of animal husbandry as an additional income for farmers is almost negligible. In both areas it was found that a relatively higher income was related to a higher percentage contribution to the agricultural household income from keeping livestock. To give an impression on the livestock inventory in the surveyed villages we computed the average number of animals per household in the Hills and in the Terai. To be able to compare the overall inventory in the two regions we converted the inventories of the different kinds of animals into livestock units* (see table 4.13).

* The ratio's used were as follows: cows and horses = 1.00; buffaloes = 1.25; goats, sheep and pigs = 0.25; chickens = 0.05. We did not have a proper criterium at hand to base these ratio's on but they will do for purposes of comparison.

Table 4.13 Number of animals and livestock units per household [1/]

	Stratum	Buffaloes	Cows	Goats	Poultry	Livestock Units
Hills	0	0.17	0.08	-	0.75	0.37
	1	1.21	1.26	0.89	2.10	3.11
	2	1.49	2.66	1.74	1.73	5.11
	3	1.72	3.03	3.06	5.20	6.29
	4	2.45	3.46	3.85	2.91	7.66
	all	1.40	1.99	1.47	2.29	4.25
Livestock Units		1.75	1.99	0.37	0.11	
% of total L.U's		41	47	9	3	
Terai	0	0.09	0.56	0.49	0.81	0.90
	1	0.19	0.81	0.48	0.57	1.20
	2	0.50	1.59	1.41	1.79	2.66
	3	0.70	3.00	0.84	1.56	4.00
	4	2.11	6.28	1.46	0.88	9.36
	all	0.86	2.90	0.97	1.13	4.29
Livestock Units		1.08	2.90	0.24	0.06	
% of total L.U.'s		25	68	6	1	

1/ A negligable number of horses, pigs and sheep has been omitted, but included in the livestock units.

The number of livestock units increases by stratum as expected. About ninety percent of the livestock units consists of buffaloes and cows. The overall average number of units is roughly the same in both territorial divisions as marked in table 4.13. As was shown in table 4.1 in the Terai 83% of the households keep some livestock while this percentage came to 96 in the Hills.

The gross income from animal husbandry comprises a number of livestock products and two more special elements. These elements are the increase in livestock inventory for which the formula "value of present inventory minus value of inventory twelve months ago minus purchases plus sales" is applied and the own use and hiring out of draught animals. Own use of draught animals is valued at the hiring rate for which similar draught animals could be hired locally. In table 4.14 we can find the gross income from different elements of animal husbandry per survey household in the Terai and in the Hills.

Table 4.14 Gross income from animal husbandry per household

	Hills		Terai	
	NRs	Perc of total	NRs	Perc of total
Total	503	100	401	100
Increase in Inventory	58	11.2	25	6.2
Manure	85	16.9	79	19.7
Buff. milk	161	32.1	139	34.7
Cattle milk	15	3.0	30	7.4
Ghee	130	25.9	21	5.2
Draught	42	8.4	102	25.4
Others 1/	12	2.4	5	1.3

1/ "Others" comprise eggs and meat in the Hills and meat, fish and curd in the Terai.

Buffalo milk is the most important livestock earner in both areas. In the Hills ghee is the next important item while in the Terai this is the use and hiring out of draught animals. Gross returns are 20% lower in the Terai as compared to the Hills. In both areas manure comprises also an important gross livestock income item.

The milk production per producing buffalo comes to 498 kg on an average in the Terai and to 374 kg on an average in the Hills. Per cow milk production is equally low in the Hills and in the Terai (144kg). The per buffalo milk production in the two villages of Kabhre district is higher than in the Terai, 677 and 840 kg respectively in Mathurapathi and Sarsiyukhark. Especially in the case of buffaloes there is a tendency for the milk yield to increase by stratum. (see annex 19).

Another aspect effecting productivity of the buffaloes is the number of animals yielding milk out of the total number in productive age. Bad feeding conditions causes this ratio to be low. For cows it is 24% in the Hills and 17% in the Terai while buffaloes yielding milk account for 63% of total stock in the Hills and 60% in the Terai.

The productivity in milk of cows is so low that we could almost conclude that chances of bringing their productivity within a reasonable range could be written off. In the case of buffaloes,however, the performance is reasonable. Both yield and percentage of animals in productive age actually producing could still be considerably improved. More detailed study of feed condition as well as occurrence of diseases could give clues to how to achieve this.

The higher livestock returns area, the Hills, receives more from ghee and the increase of the livestock inventory.

Table 4.15 Gross income from animal husbandry per livestock unit (NRs)

Strata	0	1	2	3	4	all
Hills	52	107	120	141	155	118
Terai	51	54	73	75	111	94

If we look at the returns per livestock unit (see note on p. 62) it is striking that these increase by stratum. (Table 4.15). The bigger farmers obviously have more productive livestock. This may indicate a position of outright competition for food among people and animals in the small farmers and landless groups. The high cost on animal husbandry per livestock unit in (see table 4.16) the landless groups is caused by the high estimated value of fodder obtained. By imputing the value of by-products from crop production as fodder cost in case of the other strata a more realistic estimate was obtained for these groups. Table 4.17 shows that in stratum 0 a relatively low amount of "other feed" is given. This may be compensated to some extent by somewhat higher fodder procurement but the extremely high levels as observed here are unrealistic.

Table 4.16 Cost on animal husbandry per livestock unit (NRs)

Strata	0	1	2	3	4	all
Hills	216	36	52	86	82	52
Terai	139	57	45	63	78	73

Table 4.17 Cost on animal husbandry according to items

	Fodder 1/	Other feed 2/	Lodging	Other cost 3/	Total
Hills					
All strata (NRs/L.U.)	20	27	2	3	52
Percentage of total	38.8	51.6	3.9	5.7	100
Stratum 0 (NRs/L.U.)	165	8	42	1	216
Percentage of total	76.0	3.9	19.6	0.5	100
Terai					
All strata (NRs/L.U.)	19	43	2	9	73
Percentage of total	26.3	58.7	2.5	12.5	100
Stratum 0 (NRs/L.U.)	134	4	1	-	139
Percentage of total	96.4	3.0	0.4	0.2	100

1/ Fodder is all kinds of straw and maize stalks.

2/ Other feed is all kinds of feed except straw and maize stalks as indicated in annex 20.

3/ Veterinary services, stud fee, medicines and some permanent labour cost.

On the average, cost on animal husbandry per livestock unit is higher in the Terai while the gross income is lower there. It results in a small gross margin on this activity and combined with the higher incomes from crop production and wages in that region gives the livestock section a relatively small share in the total income per household.

In the Hills farmers manage to keep up a relatively productive livestock inventory on a comparatively small area of land. Feeding of grass cut along the edges of own fields or from non-cultivable areas has not been included as cost since it was supposed not to represent a value apart from the labour involved in gathering it. This may have contributed relatively more in the Hills which would mean that labour inputs will have been higher in the Hills. This pertains mainly to family labour, however, and will be reflected by an upward push on the labour productivity in this region.

Agricultural income per worker

Growing crops and keeping livestock are activities undertaken as a household enterprise. To differentiate we called these activities the "agricultural household enterprise" and all other similarly own account undertakings "non-agricultural household enterprise."

It is a somewhat fruitless exercise to measure exactly the time family labour spent on household enterprises. It may be interesting for comparison of different techniques of operation with the aim to improve on operative efficiency but for economic evaluation time worked is a less important item in the analysis than the potential time that could be spent on household enterprises and the remuneration from such enterprises in relation to that potential time spent. Working habits differ widely. Hard and long-time workers may still earn less because of lack of proper management decisions. So, what we try to measure is the family time available for the agricultural household enterprise and the result of that enterprise in terms of the value of the net earnings. Taken into account the wages paid to and the time spent by the wage labourers in each household we may attempt to estimate the agricultural income per worker.

We have three different ratio's to look at. They are:

(1) $\frac{\text{net income from agriculture}}{\text{family labour available}}$

(2) $\frac{\text{agricultural wages paid}}{\text{time spent by wage labourers}}$

(3) $\frac{\text{net income from agriculture + agricultural wages paid}}{\text{family labour available + time spent by wage labourers.}}$

For farmers bringing in some assets on the farm it will be clear (also explained in chapter 2) that (1) should be higher than (2). If we forget about the imputed returns to the self-owned assets (3) is a reasonable overall labour productivity measurement in agriculture.

To embark on the above mentioned analysis we examined the results in the families with a household enterprise in agriculture only. They represent 92% of the total number of households in the survey villages.

Table 4.18 Agricultural income per adult equivalent family worker (I) and wages paid per adult equivalent wage labourer (II) (for households with an agricultural enterprise only)

Strata		0	1	2	3	4	all
Hills	(I)	-451	396	436	507	652	453
	(II)	-	1132	1142	1115	1008	1095
Terai	(I)	-218	170	348	652	1726	1008
	(II)	-	1110	1427	1231	1312	1304

From table 4.18 a comparison between wages paid in agriculture and family worker's income from the same enterprise can be made. The negative results in stratum 0 (the landless) are due to the adverse results in the livestock sector. In other strata there is a clear deficit in earnings by family labour engaged in the agricultural household enterprise. Only in the highest farm size class in the Terai there was a more favourable relationship between the earnings of family workers and those of labourers. It should always be born in mind here that household workers also put in their assets for which they may reasonably expect some remuneration as they have been working hard to save enough to acquire these assets. The comparison as presented here is not entirely correct because wage labourers will not be able to find work throughout the year. In table 4.19 figures on wage receipts for households whose workers are only engaged in wage labour are given. In the Hill survey villages such households were hardly found so that a comparison here has to be treated cautiously (see annex 21).

Table 4.19 Agricultural income per adult equivalent family worker in households with an agricultural enterprise only (I) and wages received per adult equivalent worker in purely wage labour households (II)

			I				II
Strata	0	1	2	3	4	all	0
Hills	-451	396	436	507	652	453	678
Terai	-218	170	348	652	1726	1008	851

From annex 21 we can derive that for the Terai where a reasonable number of observations in this category is available the result as presented here is attained at a 37% "un-cum-under-employment" level. It illustrates that even taken into account a rather high unemployment among wage earners the remuneration per adult equivalent family worker out of agricultural own-account activities remains comparatively low except for the highest stratum in the Terai.

From the above finding we may argue that the big difference between overall labour productivity in the lower Terai strata (see table 2.6) and the agricultural labour productivity (shown in table 4.19) can be explained by the importance of wage receipts in these groups.

What the comparison of agricultural enterprise earnings and wages paid per adult equivalent worker does very well indicate is the profitability of replacing wage labourers by family labourers. As we can see from table 4.20 the use of wage labour in all strata except the Terai stratum 4 where wage labour "is relatively cheap" is very limited. This situation does not mean

Table 4.20 Percentage of adult equivalent workers from family labour in households with an enterprise in agriculture only.

Stratum	0	1	2	3	4	all
Hills	100	97	96	94	89	95
Terai	100	96	95	93	73	84

that a family takes care of its farm alone and independently in most of the cases. There is a considerable amount of mutual help at peak seasons. However, as by definition in such cases labour provided and labour received cancels out this has not been recorded in the survey. By this fact operations carried out by others have been considered as carried out by the family itself while labour supplied outside the household under a mutual help arrangement has been neglected.

The findings summarily point to a tendency of very limited use of wage labourers on small farms. It will, be it economically justifiable, be limited to the bigger Terai farms (1.7 ha and above). In this survey we find on these farms 75% of the acreage in the Terai while this stratum's households provide work for 50% of the adult equivalent workers in the Terai considering only the households depending on agriculture as their sole household enterprise.

The overall productivity measure shows us a picture of moderate tendency of increase by stratum in the Hill villages and a wide variance in the Terai. (see table 4.21). The negative results in the landless class have

Table 4.21 Income per worker in agriculture 1/ (NRs)

Stratum	0	1	2	3	4	all
Hills	-451	417	465	541	690	483
Terai	-218	204	399	690	1616	1055

1/ Defined as shown on p.67 under (3).

already been explained as related to the unsuccessful livestock enterprise. It is note-worthy that labour productivity in the two smaller size classes of landed households is higher in the Hills than in the Terai. Then, in size classes 3 and 4 the productivity becomes much higher and overall the Terai agricultural labour productivity comes out to be more than twice as high as the productivity in the Hills.

The harvested area per adult equivalent worker in strata 1 and 2 in the Hills is 8.3 and 11.4 on an average respectively while it is 23.5 and 44.6 in the same strata in the Terai (see table 4.22). So, the agricultural worker on small farms in the Hills produces more from a much smaller area than his counterpart in the Terai. For stratum 3 and 4 the harvested area per agricultural worker in the Terai becomes so big as compared to the harvested area per worker in the Hills that labour productivity is higher in the Terai for these strata.

Table 4.22 Harvested area (ares) per adult equivalent worker for households with agriculture as sole enterprise.

Strata	1	2	3	4	all
Hills	8.3	11.4	16.1	27.2	12.7
Terai	23.5	44.6	70.0	160.3	106.9

Distribution of agricultural income

In chapter three we examined the contributions of other parts of the household income in compensating for the income differentials in agriculture on account of availability of land. We found that salaries and wages generally have a compensatory effect and in the Terai "other Sources" comprising mainly non-agricultural household enterprise were also found to have such an effect. There we compared income levels per survey stratum. In annex 22 and 23 we illustrate that for the Hills 59% and for the Terai 51% of the households ranked according to agricultural income roughly have the same rank on total household income. However, the within stratum variation especially in the Hills will be high because the difference in income distribution among households if we compare agricultural income and total income is not high. In table 4.23 we find Gini ratio's of agricultural income distribution among households

Table 4.23 Income distribution, agricultural net income per household, Hills and Terai

DECILES	Hills			Terai		
	Average income (NRs)	% of total	cumulative % of total	average income (NRs)	% of total	cumulative % of total
1	172	1.0	1.0	137	0.4	0.4
2	415	2.5	3.5	420	1.3	1.7
3	671	4.0	7.5	771	2.5	4.2
4	902	5.4	12.9	1111	3.4	7.6
5	1071	6.3	19.2	1503	4.7	12.3
6	1378	8.2	27.4	2025	6.3	18.6
7	1747	10.4	37.8	2706	8.9	27.5
8	2275	13.7	51.5	4005	11.6	39.1
9	2976	17.5	69.0	5680	18.0	57.1
10	5285	31.0	100.0	14103	42.9	100.0
Total	1687	Gini/ratio = 0.44		3213	Gini/ratio	= 0.57

of 0.44 for the Hills and 0.57 for the Terai. This against 0.43 and 0.51 for a similar distribution of total household income . (see table 2.4)
From annexes 22 and 23 we can also see that in the highest strata of agricultural and total household income we find to a great extent the same families which means that top total household incomes tend to be linked to top agricultural incomes.

For the Terai there is a clearcut tendency for those households not belonging to similar deciles for both income indicators to move up in rank from agricultural income to total household income. These households in the Hills move both ways with a slight preference to come down in rank. From chapter 3 we know already that the lowest total household incomes in the Terai were more significantly associated with earning wages and salaries than with agricultural income.

5. Household income from wages and salaries

In all survey panchayats income from wages or salaries was found. Wages were paid in cash as well as in kind. This kind of income can be traced relatively easily. Generally only one wage level was reported per worker and an estimate of the number of months worked could readily be given. The major stumbling-block was the matter of food receipts. Sometimes they were included in the wage reported. In other instances food was not given while in the district of Kabhre food was given with a low cash wage while it was not given if a higher wage in rupees was paid. The latter case was discovered at a later stage and has not been taken account of in the overall analysis. We will treat some of its consequences here. In addition in this chapter we will give the survey results on the adult equivalent workers involved in wage and salary earning. The income share, the number of households, number of workers and number of days will further illustrate aspects of wage and salary earning. The type of wage employment will be a subject of discussions. Separate attention will be paid to wage levels and government salaries. A brief note on the cash and kind component and receipts in Syangja district from jobs taken up outside the district will conclude this chapter.

Food receipts in Kabhre district

It was known that in Kabhre district payments to labour working on farms were low and upon additional enquiry it appeared that at the time of investigation no account of food receipts had been taken. An adjustment was made such that males reportedly being paid a daily wage of Rs.3 or less were supposed to have been paid Rs.1.50 worth of food per day in addition and the same was assumed for females making Rs. 2 or less per day. Only at a late stage it was discovered that at the wage receipts end a similar under-estimation had occurred. That is why in the overall income results in chapter 2 and 3 a relatively large amount of food received by wage earners in Kabhre district has been omitted. These food receipts increase wage and salary income by 10% in the panchayat of Mathurapathi and by 49% in Sarsiyukhark. As in the other Hill district little wage and salary income was found these food receipts increase total wage and salary income in the Hill villages, and ultimately total household income by 8% in that region. The per capita income in the Hills would increase from Rs. 308 to Rs. 335 as compared to the per capita Terai income of Rs.420 if these wage receipts in the form of food were provided for. In a number of items further on in this chapter we will present the survey results with and without these receipts.

Importance of wage and salary earning

The economic factor at work in wage and salary earning is labour. Apart from some isolated cases where tools have to be provided by the labourers there is no call on capital assets for this type of income. The degree to which this income item occupies the labour available in the household may be expressed by the percentage of adult equivalent workers [1/] represented by the number of days spent on wage and salary earning. An adult equivalent worker has been assumed equal to 300 days of work for this purpose.

The percentage of adult equivalent workers occupied in wage and salary earning was 16 in the Hills and 25 in the Terai with a gradual decrease from stratum 0 to stratum 4 from 50 to 6 percent in the Hills and from 56 to 4 percent in the Terai. As illustrated by annex 24 there is a wide variation also according to location. The rest of the adult equivalent workers was available for household enterprises. (See table 5.1). Households in the landed strata used remaining labour on crop production in the first place. Landless households, however, could make use of the residual labour force only if an animal husbandry enterprise or any non-agricultural enterprise was taken up. For a number of landless households wage and salary earning was the only economic activity. [2/] There the percentage of the labour force not engaged in wage and salary earning became automatically the rate of underemployment.[3/] As mentioned already in chapter 4 (p.69) and as depicted in annex 21 this rate was 37 in the Terai where in total 33 households were found to depend solely on wages and salaries for their income. In the Hills only four such households were found and on the basis of determination of adult equivalent workers we used (see chapter 7) these households were overemployed by 11%.

Table 5.1 Proportion of adult equivalent workers in wage and salary earning

	0	1	2	3	4	all
HILLS						
A	50	22	13	6	6	16
B	50	78	87	94	94	84
TERAI						
A	56	45	25	21	4	25
B	44	55	75	79	96	75

A = Perc. of AEW's working for wages and salaries

B = Perc. of AEW's available for household enterprises

0-4: strata

1/ See chapter 7

2/ Which does not strictly mean that it is the only source of income because transfers to the household are independent of any economic activity.

3/ Households with transfers have also been left out as for them the drawback of being unemployed is at least partly compensated for.

Another indicator for the importance of wage and salary earning in the income generation of rural households is receipts involved as a proportion of total household income. In the Hills this was found to be 27.4% and taken into account extra food handed out in the Kabhre district 41.6%. In the Terai we found this proportion to be 32.9%. While in the Hills this indicates a much higher productivity of labour in wage and salary occupations (16% of the labour force earning over 40% of the household income) also in the Terai there is an indication that returns from wages and salaries exceed the returns from household enterprises per adult equivalent worker engaged. 1/

Number of households, workers and days

In tables 5.2a and 5.2b some more aspects of wage and salary earning are given. In the Hills 54% of the households earn wages or salaries while in the Terai this comes to 70%. This percentage decreases from stratum 0 to stratum 4 as expected. The lower percentage in the Hills is due to the small proportion of the households in the Syangja villages earning wages or salaries, ¼ and 1/3 in Tulsi Bhanjyang and Pauway Gaude respectively. Opportunities for wage and salary earning seem to be low there.

The number of workers per household involved in wage or salary earning is higher in the Hills than in the Terai. The number in the Hills increases by stratum. In stratum 4 in the Terai less than one person on an average per household is engaged in wage or salary earning. One explanation will be that there are more workers on an average per household in the Hills.

1/ It has not been assessed whether workers that did not have alternative employment, actually worked on one or more household enterprises. Time spent on such activities is very difficult to recuperate and from the point of view of the people involved most important is that they are dependent on whatever they can manage to earn from household enterprises while they don't have any other employment. These earnings in relation to the people's time involved in such periods are the overall relevant criterium to evaluate such life economically. A low productivity shown may be due to lack of assets, low efficiency and lack of proper management, all interrelated and in turn caused by other underlying factors.

Table 5.2a Households, workers and days involved in wage and salary earning (stratumwise)

Item	Strata	0	1	2	3	4	all
Percentage of households	Hills	58	56	61	48	18	54
	Terai	94	90	82	69	36	70
Workers per household	Hills	1.43	1.35	1.65	1.79	2.53	1.50
	Terai	1.42	1.41	1.32	1.49	0.72	1.32
Days per worker	Hills	240	190	133	94	167	163
	Terai	209	183	135	130	110	163

Table 5.2 b Households, workers and days involved in wage and salary earning (villagewise)

Item	Village [1/]	all	1 or 3	2 or 4	7 or 5	8 or 6
Percentage of households	Hills	54	68	79	24	33
	Terai	70	73	69	70	63
Workers per household	Hills	1.50	1.36	1.76	1.19	1.00
	Terai	1.32	1.29	1.67	1.26	1.34
Days per worker	Hills	163	137	154	206	256
	Terai	163	174	220	172	74

1/ For village codes see p.6

Wage and salary earning households in stratum 4 in the Terai can possibly not afford to leave a high number of workers engaged in outside jobs as the family farm will be so big that it needs a high proportion of the household's family labour force to look after it. Upper strata Hill farms are considerably smaller than their counterparts in the Terai. The panchayat of Sarsiyukhark in Kabhre district contributes heavily to the higher number of workers figure per household engaged in wage or salary earning in the Hills. In this panchayat we found also the highest percentage of households with wage or salary income.

For the fact that wage and salary income is not spread more evenly over all households two explanations could be given. Firstly, any household in which there is one member who managed to get some wage or salary employment will be in a relatively favourable position to get more members in this occupation. Secondly, there may be households from higher social and economic strata that consider it to be below their status to work for wages. The influence of this factor, taken wages and salaries together, will be compensated to some extent by the relative advantage of high status groups in soliciting government salary employment.

The number of days spent per worker on wage and salary employment is equal for the Hill and Terai regions. It is 161 and in the Terai it comes down from 209 for workers from landless households to 110 days for workers in the highest stratum. In the Hills too, it comes down from 270 while moving from stratum 0 to stratum 3 but stratum 4 shows a relatively high number of 167 days per worker. Villagewise the variation of number of days spent on wage or salary earning is high and runs from 74 days for a worker from Raybapur in the Terai to 256 for a worker from Pauway Gaude in the Hills. The high figure for Pauway Gaude will be caused by the relatively high proportion of full time salary workers among the wage and salary earners in that village. (See also p.80).

Type of work

From table 5.3 we can see that while non-agricultural work is predominant among wage and salary earners in the Hills agricultural activities is their mainstay in the Terai. Higher strata in the Terai, however, also get most of their salary and wage earnings out of non-agricultural work. The fact that the earnings in the Hill villages are mainly non-agricultural is caused by the situation in Syangja district where almost all earnings are from other than agricultural jobs. While the village of Bijalpura in Mahottari district shows a very high percentage of wages and salaries from agricultural work in Itaharawa village (Mahottari) and Semlar village (Rupandehi) wages and salaries originate from agricultural and other jobs on about a fifty-fifty basis. In the village of Raybapur in Rupandehi district the type of work was not mentioned. It has been classified as non-agricultural but, there too, quite some agricultural jobs are likely to be found which would bring the percentage of agricultural wage and salary earnings in Terai up even further.

49% out of non-agricultural wage and salary receipts in the Hills and 47% in the Terai originate from service jobs which include and consist to a great extent of government service. With 25% of non-agricultural receipts in the Hills porterage represents an important source of wage.

Table 5.3 Wage and salary earnings according to type of work (percentages)

HILLS	0	1	2	3	4	all
Agricultural	19	32	50	41	17	35
Non-agricultural	81	68	50	59	83	65
TERAI						
Agricultural	79	85	66	47	11	61
Non-agricultural	21	15	34	53	89	39

HILL - villages	1	2	7	8	all
Agricultural	61	55	3	2	35
Non-agricultural	39	45	97	98	65
TERAI - villages	3	4	5	6	all
Agricultural	86	55	50	0	61
Non-agricultural	14	45	50	100	39

0-4: strata 1-8: village codes as on p.6

and salary income. With 49% of the receipts in the Terai classified as non-agricultural not specified the bulk of these wages and salaries have been accounted for. In the Hills there are 11% not specified while 6% receipts are accrued by teachers and another 6% by a conductor-cum-mechanic.

The more important non-agricultural sources of wages and salaries in the Hills, service jobs and porterage, can be distinguished according to average number of days per worker that income was drawn from them. For service jobs this is 295 or almost a full year while workers earning from porterage undertook such activity for on an average 174 days of the year. Other non-agricultural wage and salary jobs in the Hills were almost invariably full time. Agricultural wage and salary earners spent on an average 270 days in this region.

Service jobs in the Terai commanded 293 days per worker. Unspecified jobs, quite numerous in the Terai, came to 127 days per worker on an average. Agricultural work in this region provided the workers involved with 250 days of employment per year on an average.

It appears from these data that porterage in the Hills and miscellaneous jobs in the Terai are part-time jobs while other jobs are or approach closely full-time occupations.

Wage levels

Wages in Nepali rupees per day have been computed per stratum and per village. Thereby salary earnings have been discarded. Also a comparison between certain important types of work as regards the earnings per day of work has been set up. In this case wages and salaries have been taken together.

As for wage levels excluding salaries table 5.4 gives a picture of randomly varying figures according to stratum. It means that workers from households with bigger farms do not get higher wages. The average wage level is somewhat higher in the Terai, Rs. 4.38 per day as against Rs. 3.95 per day with food and Rs. 2.74 per day without food receipts in Kabhre district. However, in the Terai villages surveyed close to the Indian border wages were lower than the average in the Hills (food in Kabhre included).

If agricultural work is taken only the difference in wage level between Hills and Terai is bigger. Without the food receipts in Kabhre the Hill agricultural wage level comes to Rs. 2.65 while the Terai rate for similar work comes to Rs. 5.19 (see table 5.5). Even if an overall Rs. 1.50 food hand out for the Hills would be applied the difference would still be at least NRs. 1 per day. Out of the type of jobs contributing more significantly

Table 5.4 Wages in NRs/day (from annexes 25 and 26)

Strata	0	1	2	3	4	all
Hills	2.33	2.80	2.55	2.58	3.58	2.74
	(2.66)	(4.05)	(3.91)	(3.40)	(3.72)	(3.95)
Terai	4.55	4.49	4.50	3.83	4.39	4.38

Villages 1/	1 or 3	2 or 4	7 or 5	8 or 6	all
Hills	2.87	2.63	3.82	3.59	2.74
	(4.00)	(3.95)			(3.95)
Terai	5.14	3.77	4.20	3.05	4.38

1/ 1, 2, 7 and 8 are Hill villages For codes of villages see p.6
3,4, 5 and 6 are Terai villages

In brackets: wages taken into account food distributed in villages 1 and 2

to wage and salary earnings service jobs in the Hills which include government salaries show a comparatively high daily rate of remuneration of Rs.5.73. Porterage jobs pay even less than agricultural jobs, Rs.2.58 largely without food. In the Terai fluctuation of wages is not so big. The service jobs which remain below average combine however government salaries with very low paid servants kept for household duties mainly.

Table 5.5 Earnings per day 1/ according to type of work (Wages and salaries)

	Overall	Service jobs	Porterage	Agricultural jobs	Unknown
Hills	3.50	5.73	2.58	2.65	3.87
Terai	5.24	5.10	-	5.19	6.01

1/ Only important categories of types of jobs; food receipts in Kabhre not taken into account, see also table 5.4

Government salaries

In the Hills 6.5% of the households and in the Terai 5.5% receive income out of government salaries. In the Hills the village of Pauway Gaude counts most of the government salary earners. They represent 24.2% of the households in this panchayat. In the Terai it is the village of Semlar where most of the government employees are found. They represent 13% of the households there. In the Hills receipts amount to 7.7% of the total household income for that region in the survey. Terai government salaries amount to 5.5% of total household income there. It should be noted that 53% of the salary receipts in the Hill villages originate from foreign service (mainly India). The average salary received in the Hills amounted to NRs 1979 while in the Terai this was NRs 2394.

Salaries earned abroad are in fact remittances. It has not been exactly established whether these salaries were gross or net of expenses by the salary earner concerned. The level of these salaries do suggest that they are in fact only the part remitted to the household concerned and should have been recorded as remittances. Not sure of this they have been left in this category.

Cash and kind receipts

In table 5.6 a summary has been given of the distinction of payment of wages and salaries in cash and kind. Payments in kind are more common in the Terai villages. 57% of wages and salaries are paid in kind there. Not taken into account the food payments in Kabhre district only 6% of salaries and wages are paid in kind in the Hill villages. Including these food payments in kind wages and salaries increase to 34%. Within the Terai in-kind payments are somewhat less important in strata 3 and 4. In these strata we find almost all government salaries and these are paid in cash. The main area of in-kind payments was found to be Mahottari district where 81% and 90% of salaries and wages were paid in kind in Bijalpura and Itaharawa villages respectively. In these villages only one

Table 5.6 In-kind and cash wages and salaries

Strata	0	1	2	3	4	all
Hills A	0	9	0	0	0	6
	(12)	(37)	(34)	(24)	(4)	(34)
B	100	91	100	100	100	94
	(88)	(63)	(66)	(76)	(96)	(66)
Terai A	63	66	51	37	32	57
B	37	34	49	63	68	43

Villages 1/	1	2	7	8	Hills	3	4	5	6	Terai
A	8	5	0	0	6	81	90	20	24	57
	(33)	(37)			(34)					
B	92	95	100	100	94	19	10	80	76	43
	(67)	(63)			(66)					

In brackets: taken into account food receipts in Kabhre district

1/ For village codes see p.6

A = Percentage in kind wage and salary payments

B = Percentage cash wage and salary payments

household with a government salary was found. As for other phenomena in this survey it is clear that a geographically more elaborate coverage is needed to come to significant conclusions on cash and kind payments of wages and salaries.

Receipts from outside the district of residence

The only district where salary and wage earners work outside the district at a significant rate is Syangja. In that district wage and salary income on the whole has already been found relatively low. We also found already that a major part of government salaries in the Hills were earned in India. All the households concerned with this live in Syangja district. Out of total wage and salary receipts from outside the district 38% were salaries earned in India. Apart from this phenomenon (see for salaries from abroad also p. 80) Syangja district shows also the highest amount of remittances as percentage of total household income (see annex 11).

As indicated already in the para on government salaries a considerable amount of de facto remittances have been recorded as salaries and wages. The persons concerned should not have been recorded as members of the household in case net receipts have been reported while in the case gross receipts have been reported the resulting per capita income has to be evaluated differently as the cost of living of a worker abroad will be relatively higher than for a person living in a household in Nepal. The way we processed these data implies that we assumed these to be gross receipts while the evaluation of results takes the person living abroad as if he stayed within the household.

From the above observations it emerges that there is a pressure on labour in the Syangja villages surveyed which resulted in migratory movements in search of opportunities to increase household income. This has been relatively successful as the persons involved in earning salaries and wages outside the district represent 40% of the total number of wage and salary earners and bring in 55% of the receipts on wages and salaries in this district.

Almost all wages and salaries earned outside the district are generated in India.

6. Family income from miscellaneous sources

So far, agricultural income and wage and salary income have had a separate treatment in this report. Other income items are earnings from non-agricultural household enterprises, pensions, remittances and receipts from other sources, mainly property income like rents and interest.

It is a pity that we cannot treat non-agricultural household enterprises separately. For one thing, there has been found too few earnings from this source to justify a separate analysis. Secondly the category is very diversified so that it is impossible to treat it as an aggregate. Thirdly, collection of details on this income item appears to be much demanding especially in the framework of an overall income survey like the one we report on here.

For landless Hill and Terai households as well as stratum 1 and 2 Terai households non-agricultural enterprise has relatively more importance. Landless households derive 22 and 10 per cent of their income from this source in Hills and Terai respectively. Terai stratum 1 and 2 get 13 and 12 percent of their income from these enterprises. This has to be looked at against an overall percentage of 1.2 in the Hills and 3.6 in the Terai for this type of income. In the Hills 5.8 per cent or 1 out of 17 households gets some income from a non-agricultural household enterprise while in the Terai this is 8.9% or 1 out of 11 households.

If we consider milling of paddy and milling for oil to be services the bulk of the non-agricultural household enterprise consists of services. Construction of dwellings, sheds, etc., which is the only non-service activity of significance is not undertaken on a contract basis but as a wage labour occupation. The undertaking is effectively the household's own activity. On page 14 we reported already that household income out of building the own residence has not been taken into account and that it would probably constitute a minor part of it. In the case of buildings for economic use the household's own construction activity has been remunerated by not allowing for depreciation on these while computing household enterprise income.

Table 6.1 Income from miscellaneous 1/ sources as percentage of total household income

Strata	0	1	2	3	4	all
Hills	43.2	7.6	11.8	8.0	7.2	9.0
Terai	9.6	13.8	16.0	14.6	2.3	8.0

Village	(1)	(2)	(7)	(8)	all
Hills	2.1	4.5	10.1	18.8	9.0
Village	(3)	(4)	(5)	(6)	all
Terai	4.7	2.9	10.6	0.6	8.0

1/ Non-agricultural household enterprise, pensions, remittances and other sources

For village codes see p.6

Table 6.1 gives a summary of the importance of the overall miscellaneous sources of income. The relatively more important contributions noted in stratum 0 of the Hills and 1 and 2 in the Terai pertains to non-agricultural household enterprise as mentioned above. Stratum 2 in the Hills and 3 in the Terai derive their significance from contributions from pensions.

The importance of this type of income in Pauway Gaude village (18.8 per cent of the total) has to be attributed to contributions from pensions and remittances both. In this village remittances would have played an even more important role if a number of salaries earned in India would have been classified here (see p.82).

Remains to be mentioned that in the Hills 4.0% of total income originated from pensions, 2.6 from remittances and 1.2 from other sources. In the Terai these figures are 2.5, 1.9 and nil respectively.

7. Household income, labour productivity and employment

Introduction

In some sections of this report we have focussed on unemployment matters. It has been argued that wage and salary employment lends itself much better to a physical analysis of employment than employment in a household enterprise. In the latter sector we will have to confine ourselves to income and productivity measurements to characterise employment. However, wage and salary employment should also ultimately be subjected to the labour productivity criterion, as Ranis and Fei[1/] call it, "perhaps the most crucial single index of economic development".

The agricultural wage level in a labour surplus economy tends to be determined by institutional factors. It will not reach far above the bare minimum of subsistence and will be roughly equal to the average labour productivity in agriculture. The wage will be high enough to cover food, clothing and shelter requirements at this minimum level. There are several forms in which such a wage can be expressed. It may be a full-time agricultural worker who gets a wage in money from which he is able to buy his requirements for himself and his dependants. It could be a part-time agricultural worker paid in cash who has sufficient time left to take care of the necessary shelter and clothing for himself or herself. So this worker buys less, but will also have a lower wage income. Then there is the worker who produces everything himself or herself in a kind of self-sufficiency enterprise. This will be a rare case and generally there will be some specialisation in agriculture, textile manufacturing or construction while requirements are met only after exchange of commodities and/or services. However, on a household basis self-sufficiency may be almost achieved on account of labour distribution within this social unit.

Labour productivity in agriculture should increase in order to provide for an increasing agricultural surplus which is essential for economic development. A gradual shift of labour from agricultural to industrial activities is the crucial phenomenon in development. The agricultural surplus will then be required to feed those workers in industry and to provide raw materials for industrial enterprises.

1/ Fei, John C.H. and Ranis, Gustav: Development of the Labour Surplus Economy; The Economic Growth Centre, Yale University, USA, 1964. For this chapter some of the frame of thinking is derived from this publication.

If workers leave agriculture, a surplus is automatically created if marginal productivity is zero, as is often assumed in traditional agriculture. This means that with any agricultural worker departing produce per worker in agriculture increases. If the remaining workers are not going to eat more then we will find a surplus left which the industrial worker could, as Ranis and Fei vividly depict, carry along on his job. Such a surplus takes the form of a wages fund, and is most apparent in numerous food for work programmes for rural infrastructure.

Work in agriculture has to be completed with fewer people, which means that those who remain in agriculture will have to increase productivity. It cannot be assumed that the idle rural labour force, if it exists at all, is just the group that leaves agriculture first. In fact, it would be rather desirable and could even be most likely that a relatively productive part of the agricultural labour force residing in cultivators' households embarks on non-agricultural activities first.

However, if marginal productivity is not zero, then the surplus will not be sufficient to feed the departing work force. Where agriculture is traditional and mainly geared towards producing for own consumption, the need for survival will make labour force entrants strive hard to increase production. Although resources in a small area may sometimes be exploited to the maximum so that more labour indeed yields no additional produce, this cannot be said of entire countries generally. If we take the example of Nepal, some hill areas may be at their limit of increase in production with the existing resource base, but the Terai definitely offers scope for increased production. The production per area unit is much higher in hill agriculture, so that the higher population density can be coped with. This is achieved by the application of a different farming system, with more benefits from the livestock enterprise directly and also indirectly through manure applied to crops. Labour requirements for this more intensive system are relatively high, but so is the output per area unit. It is questionable whether such a delicate farming system can yield similar results with less workers and especially without the more enterprising part of the agricultural labour force that may opt for more remunerative industrial activities and in the past may have been the main pillar of the improved farming system. (For a graphical illustration see Annex 27).

The overall conclusion for Nepal agricultural conditions that suggests itself is that a major labour productivity increase on account of improved farming systems and/or an increase in other inputs than labour is urgently needed if sustained development is to be made possible. Applied research in a number of areas, preferably those in the neighbourhood of which industrialisation is going to take place first, should come up with new farm practices, possibly new varieties of crops and other systems of animal husbandry. Only an agricultural sector that is thus prepared for a jump in labour productivity can support the required industrial development.

Household income

Whereas production, productivity and labour inputs as discussed in the above paragraph, are elements of the analysis at the macro level, it is the household's income that determines the ultimate well-being of the workers and their dependants. For the members of a household it matters just how much of total produce accrues to them. The position of an individual household can be very different from that of the whole economy. Resource base, quantitative and qualitative, and household composition vary widely. Skill is also a source of variation. To measure the economic success of these individual households the concept of household income has been introduced in the beginning of this report. It is similar to the concept of income as produce, [1/] where net income becomes identifiable with the net value which the owners of the factors of production receive as remuneration for their contributions to the productive process. These factors are labour only, or labour and capital, where land is included in capital. The part which we consider a remuneration for labour could be called labour income, and the other part capital income. They are similar in genesis to wages and interest but for business enterprises they do not appear separated.

Household income is more well known as personal income. As mentioned earlier, the sum of this personal income is equal to the national income. However, national income accounts do not generally meet this requirement. Below we give an outline of how in practice national and personal income relates:

$\sum$ Final products = gross national product (GNP)
GNP - (allowance for capital consumption) = net national product (NNP)
NNP - (indirect business taxes) = national income at factor costs
(national income at factor costs) - (undistributed earnings + transfers) = personal income.

Under Nepali conditions national income at factor costs and personal income will be near to identical.

1/ From E. Lindahl: The Concept of Income (1933) in Readings in the Concept and Measurement of Income, edited with an introduction by R.H. Parker and G.C. Harcourt, 1969, Cambridge University Press, Great Britain.

If we look at the introductory paragraph above, we should realise that labour productivity as product per unit of labour is built up out of a contribution from labour itself, and the complementary aid of capital. In fact, a production function, plotting production against labour, only holds for a certain level of capital endowment. For each of the presented strata in the survey there will be a different labour/production function as labour can be combined with an increasing area of land. Land and livestock are the major capital items. Capital on livestock, like that on farm buildings, can however be accumulated by labour within the family. Land can only be acquired by purchase or by renting it. As has been explained before, the land price, especially in the hills, has become very high as compared to the productivity of it. The interest forfeited because of the capital thus 'locked up' could quite well match the high level of land rents. As was also shown earlier in this report, interest imputed on capital for Hill farms wipes out all of the labour income there, whereas it brings the Terai labour income down considerably. Altogether, this leaves us with a structural picture that shows us how labour loses out to capital for a large part of the rural population, that is to say, the small mainly owner-operators in Nepali agriculture, especially in the Hills.

Although it seems that there are not yet many Hill families completely landless [1/], the trend which is far advanced in some pockets of the Terai, where there are large groups of landless labourers, is apparent in the Hills as well. It is a slow process of squeezing the small farmer from his vital resource - land. As productivity in all size classes of Hill farmers is similarly low there does not seem to be an alternative to large scale exodus in search for land. The government can have an important regulating task in this affair, by ensuring that the land which will become available in the Hills will get into the hands of the most needy remaining families .[2/]

1/ On the basis of results of this survey, but there are reports of about 15% of Hill households being landless. A lot will depend on what is considered to be landed. In the survey, a piece of 0.004 ha. (40 m^2) cultivated has still been taken as a farm.

2/ See also K.H. Zevering, Agricultural Development and Agrarian Structure in Nepal (ARTEP working paper), Bangkok, July 1974, pp.85-90.

Adult equivalent workers

To calculate labour productivity or income per worker, a yard-stick had to be introduced to measure the input of family workers. Although adult equivalent workers as a concept has been subject to criticism, we have taken this. In fact, we could have labelled it differently as time available by any person belonging to the labour force has been valued equally and thus a time unit contribution of labour from children, males and females had equal weight. Time equivalent workers could have been used to indicate that the only differentiation on which categories of workers were evaluated was the time which they were supposedly and reportedly available for economic activities. We stuck to the expression 'adult equivalent workers' because of its common usage.

The following criteria have been used to differentiate according to time available from family workers:

male	: female	1	:	0.8 [1/]
adult	: child not attending school	1	:	0.8
adult	: child attending school	1	:	0.1

Children have been considered adult workers from the age of 15 unless the family status had otherwise indicated (e.g. that they still followed education). Children and males have only been considered if they had been indicated as economically active. Females in the Hills were treated the same way. In the Terai there had been surprisingly few females registered as economically active. Therefore, females not indicated as economically active have been given weight as adult equivalent workers with a ratio of 0.1 in Mahottari district and a ratio of 0.3 in Rupandehi district [2/] and those indicated as economically active with an additional weight of 0.7 and 0.5 respectively as to come to the generally applied ratio of 0.8 on female versus male time spent on economic activities.

1/ See p.60 Rural Employment Problems in the UAR, ILO, 1969; and tables with notes on Rural Employment and Unemployment, National Sample survey, July 1958-June 1959, India, 1965, and similar data from the NSS, 1960-1961 (see also annex 28).

2/ These separate ratios have been derived from Nepal Census data 1971.

As a summary ratio used for different categories of family members are given in Table 7.1

Table 7.1

Ratios used for computation of supply of adult equivalent workers in different regions of the survey

Family member categories		Regions		
		Hills	Mahottari	Rupandehi
Males 0-14 years) Economically active)	going to school	0.1	0.1	0.1
	not going to school	0.8	0.8	0.8
Males 15+ years Economically active		1.0	1.0	1.0
Females 0-14 years) Economically active)	going to school	0.08	0.08	0.08
	not going to school	0.64	0.64	0.64
Females 15 - 59 years		0	0.1	0.3
Females 15-59 years Economically active		0.8	0.7	0.5
Females 60+ years Economically active		0.8	0.8	0.8
Others		0	0	0

1/ These separate ratios have been derived from Nepal Census data 1971.

Further, Table 7.2 gives the results of the computation of labour supply per stratum for Hills and Terai as a ratio to the total population recorded. Rates vary irregularly according to stratum.

Table 7.2

Participation rates (adult equivalent workers : total population) Hills and Terai

Stratum	0	1	2	3	4	All (weighted)
Hills (weighted)	0.42	0.49	0.54	0.48	0.51	0.51
Terai (weighted)	0.36	0.37	0.40	0.36	0.32	0.35

As expected we find relatively few workers in the Terai. This relates to the lower participation rates of females there. Females in the Terai may do more work classified as household work which is nevertheless essential for the household. Grain milling is such an activity. In the Hills, this is more often done by mills run on water power. In the Terai, processing of dung into dungcakes for fuel might also be considered household work. Application of manure in the field which is very common in the Hills may however be recorded as an economic activity. Men are more likely to collect fuelwood because of the hazards involved, and as men are more likely to be automatically recorded as economically active, this activity may be classified in the Hills as economic activity, contrary to its counterpart activity in the Terai. Only after clear cut answers can be given to these statistical details can a more pertinent explanation of such differences be given. It should be realised that in the current analysis this difference has influenced labour productivity differentials between Hills and Terai to a great extent.

As household size increased by stratum (see annex 8), it could be expected that the number of workers per household would do the same. In table 7.3 this is illustrated. Because of the higher participation ratio the lower number of persons per household in the Hills yields a higher number of ault equivalent workers as compared to the Terai. The composition of the work force in the two main areas is depicted in Table 7.4 Females do contribute relatively little in the Terai, but the above considerations should call for caution in making this conclusion.

Table 7.3

Adult equivalent workers per household, Hills and Terai

Stratum	0	1	2	3	4	All (weighted)
Hills (weighted)	1.33	2.12	3.47	4.13	4.38	2.77
Terai (weighted)	1.66	1.70	1.94	2.10	2.35	2.00

Table 7.4

Percentage contribution to total labour force from children, adult males and adult females

	Children	Adult males	Adult females	Total
Hills	5.9	49.3	44.8	100
Terai	3.4	77.6	19.1	100

Employment as a level of productivity

In this report, importance has been attached to the ratio of household income over adult equivalent workers, per household, per stratum, per village and for aggregated results of the survey undertaken for two regions. Wage earnings and household enterprise earnings have been looked at separately. More detailed analysis of the agricultural household enterprise's productivity has been made.

Here we may compare returns to labour (and capital) of three groups of households already taken apart in the course of this report. These are:

A - households with only an agricultural household enterprise (in addition they have sources of income other than household enterprises);

B - households with wage labour income only, and

C - the heterogeneous group of all households included in the survey. In Table 7.4 we have brought together the income for these groups as related to the number of adult equivalent workers concerned. For the group with an agricultural household enterprise only, it is net agricultural income ; adult equivalent workers available for household enterprises, for the wage earning group the total wage divided by the total number of AEW's in these households and for all the households total net income over total AEW's. 1/

The amounts brought out in Table 7.5 are annual net value added to labour and own capital. Said differently, it reflects the labour productivity at the level of capital endowment of the households during 1973. The households in category B and part of stratum 0 category C either had no assets or for category B at least did not use them. Other groups of households all did use some assets to achieve the net returns to labour as indicated in this table.

Table 7.4

Labour productivity for different survey groups (see text)
Net income per adult equivalent family worker (Rs.)

Strata	0	1	2	3	4	All (weighted)
Hills						
Group A	-451 (-451)	396 (427)	436 (471)	507 (517)	652 (664)	453 (482)
Group B	678					
Group C	656	593	573	614	755	607
Terai						
Group A	-218 (-137)	170 (233)	348 (409)	652 (736)	1,726 (1,795)	1,008 (1,071)
Group B	851					
Group C	793	810	731	1,034	1,879	1,197

Note: Days of wage earning converted into AEW's for A were subtracted from the total labour supply. For each wage earner conversion was made on the basis of 300 days or more = 1 AEW. Results given in brackets refer to a basis of 200 days or more.

1/ Note that for the last ratio income items not related to the household's labour input like pensions and remittances are included.

A pure wage earner in the Hills with Rs.678 was better off than a worker in any of the strata of agricultural net income receivers there. There were very little pure wage earning households in the Hills (only 4) sample, so caution has to be taken in interpreting this. Except for stratum 4 the Terai results, however, show the same picture. Here there was a sizable group of sole wage earning households (33) in the sample.

If we compare the workers return in the Hills sole wage earning households with the overall net income to an adult equivalent worker, we again see that only stratum 4 can match it. For the Terai stratum 3 and 4 can do the same. For the other strata, although they use more assets, the net return is lower.

If we assume that especially for the Terai case with a more numerous representation the wage earned by the groups of sole wage earning households is the institutional wage mentioned in the introduction we could come to the following interesting assessment.

The NRs.851 per adult equivalent worker earned in sole wage earning households is related to 189 [1/] days of work which comes down to a daily wage of Rs. 4.50. If we put a full year of employment at 300 days, then the Rs.1008 earned full time in agriculture result in a daily wage of Rs.3.36. If instead we put full employment at 200 days we derive a daily wage in agriculture of 1071 ÷ 200 = Rs.5.36. It is generally expected that the institutional wage rate establishes at the level of the average labour productivity. (See the introduction to this chapter). If that is true here for the labour productivity as we defined it full time employment in agriculture in turn would be characterised by a number of 224 days (1,008 ÷ 4.50). With 189 days per adult equivalent worker earning wages only, this means 16% un-cum-underemployment. In this category of workers this will actually be represented by idle work days. For strata 0 to 3 encompassing 67% of the households another type of un-cum-underemployment surfaces. It is a percentage from 35 in stratum 3 to 122 in stratum 0 reflecting lack of productive employment in these groups. It marks in fact the extent to which productivity lies below average productivity.[2/]

Unfortunately results from the Hills do not warrant this analysis with respect to the group of sole wage earning households because they were too few in the sample, but we could apply the same calculus to the agricultural incomes to arrive at percentages of from 200 for stratum 0 to 4 for stratum 2, characterising here the level of lack of productive employment.

1/ Annex 21: number of days worked for the Terai (weighted) divided by the AEW's for the Terai (weighted).

2/ See for a new approach to labour force statistics including allowance for low productivity labour Philip M. Hauser, "The Measurement of Labor Utilization", Paper presented at the Fourth ODA (Organisation of Demographic Associates) Conference, Manila, 1974.

At the current level of technology it appears that farms below 0.42 ha of cultivable area in the Hills and 1.70 ha in the Terai are operated below average productivity which means that the capital (mainly land)/ labour ratio on these farms has become too small. As can be seen from table 7.6 for the Hill villages there is no sign that low productivity

Table 7.6

Net income from crop production per hectate of land cultivated (NRs)

Stratum	1	2	3	4	all (weighted)
Hills	4146	3736	3768	2348	3454
Terai	942	925	1284	1036	1073

per area unit contributes to this situation as this productivity as measured by net income per cultivated ha. is higher on smaller farms. This is not so for Terai farms where smaller farms tend to demonstrate a lower per area unit productivity too. It means that for stratum 1 and 2 in the Terai lack of productive employment can to some extent be resolved by an increase in productivity per ha. cultivated using already existing production techniques. The para. on crop production in chapter 4 goes more into detail on the nature of such improvement. However, the relatively high per area unit productivity in stratum 3 combined with this stratum's low labour productivity shows that this kind of improvement will have limited results and that under existing technology there remains a big portion of underemployment or under-productivity which can only be alleviated by a change in technology (change in farming systems, stepping up of input level) or a wider capital/output ratio as exists for stratum 4. Such a breakthrough or reform is even more needed in the Terai than in the Hills because for Terai stratum 3 (almost one third of the households surveyed in the Terai) we find a lack of productive employment as defined above of 35% while for stratum 1 in the Hills (with three fifths of the surveyed households in the Hills) it is only 13%. Such a yardstick assumes, however, that lack of productive employment should be viewed against the local average productivity. From national point of view the much higher average productivity in the Terai of course points to a better situation there, and identifies the Hills as the main problem area. As was pointed out earlier in this chapter, however, results of the survey do strongly suggest that in agriculture solution of problems in the Terai is the key to a way out for the Hills.

8. Household income of recently migrated households

At the time of enumeration information was collected about migratory movements of households (annex 3, item 9). In the village of Semlar in Rupandehi district in the Western development region so many recently (during the year of 1969 to 1973) migrated households were recorded that in the sample for the final questionnaire there appeared automatically a sufficient number of them to compare their economic characteristics and to draw some justified generalized conclusions. Another recently migrated household appeared in the sample in Raybapur, also in Rupandehi district.

The village panchayat of Semlar saw its population tripled during the last ten years. It is situated just on the foot of the Hill range that stretches North into the district of Palpa. All kinds of settlement, legal and illegal, take place. At the time of the survey there were cases that households applied to be interviewed because they thought they could acquire property rights on the basis of that. Purnavas deals with the allotment of land on some common land but much also is just bought by the in-migrants.

Two schedules on out-migration were included in the main questionnaire, one about former household members involved and one about the transfers taking place between the household and the out-migrants. The net receipts out of these transfers figured as remittances among the sources of income. At 8.2%, not counted some salary apparently earned on jobs in India, the village of Pauway Gaude in Syangja district got relatively most income from this source. The village of Tulsi Bhanjyang in the same district reported the highest number of people that had migrated as a percentage of the current number of inhabitants. (10.1%). The impression is that there are big local differentials in out-migration so that not much can be said about its magnitude on such a small sample. In Syangja certain villages reportedly became relatively prosperous as a result of remittances.

Semlar migrants

We may further look at the households in Semlar village that reported to have arrived during the last five years. Information about their place of origin was given on the enumeration schedule but has not been retained. It is possible, however, to compare migrants with non-migrants to see whether they are successful after "the big step."

First of all we may identify the population of migrated households as compared to the other households in Semlar. (see table 8.1). It appears that the migrated households are somewhat concentrated in stratum 1 which means that they are small farmers. Landless and bigger farmers are consequently under-represented. Migrated households are on the average a bit bigger than others. Particularly the group of small farmers (stratum 1) shows a much bigger size of family among the migrated households.

The notable difference in family size in the major group of migrants (those in stratum 1) is possibly the explanation for the marked difference in household income between migrants and non-migrants. (see table 8.2 and compare stratum 1 for migrants and non-migrants). The overall income level is the same for both sections of the community in Semiar. However , not only the recently migrated families in strata 1, 2 and 3 earn more, also the distribution among sources shows difference between migrants and non-migrants. Migrants earn more from wages and salaries and also from animal husbandry. Consequently dependence of the migrants on crop production is lower.# The absolute level of earnings from crop production in stratum 1 is still higher for the migrants.

The overall picture of the migrant family thus is that they have less land and consequently try to compensate this disadvantage by engaging in wage, salary and animal husbandry employment in which they seem to be completely successful.

It is interesting to note that compensation was found in various ways. In stratum 2 it was income from non-agricultural household enterprise. In stratum 1 it was wage income from agriculture and in strata 3 and 4 it appears to be animal husbandry and non-agricultural wages and salaries.

Table 8.1 Recently migrated and total sample in Semlar

Stratum	0			1			2			3			4			All		
	hh's 1/	%	hh size	hh's	%	hh size	hh's	%	hh size	hh's	% of total	hh' size	hh's	% of total	hh size	hh's	% of total	hh 2/ size
Total sample	18	21.4	4.4	20	23.8	4.8	14	16.7	4.2	15	17.9	6.2	17	20.2	8.0	84	100	6.3
Migrated households	5	14.3	4.0	15	42.9	5.1	6	17.1	4.7	4	11.4	8.8	5	14.3	7.8	35	100	6.6
Non-migrated households	13	26.5	4.5	5	10.2	3.8	8	16.3	3.9	11	22.4	5.3	12	24.5	8.1	49	100	6.1

1/ hh = household

2/ weighted average

Table 8.2 Household income per household, migrated and non-migrated households in Semlar, stratumwise and sourcewise (NRs)

		I	II	III	IV	V	VI	VII	VIII	all
Migrated	0	-	10	1267	288	-	-	60	-	1625
	1	290	-50	1350	120	45	-	251	-	2007
	2	620	121	258	490	140	-	1000	-	2629
	3	1935	335	270	1899	167	575	-	-	5180
	4	2323	778	141	1502	128	100	-	-	4973
	all	1335	342	533	1041	108	157	208	-	3725
	percentages	35.8	9.2	14.3	28.0	2.9	4.2	5.6	-	100
Non-migrated	0	-	-18	908	206	-	-	541	-	1645
	1	159	-	532	400	-	-	177	37	1304
	2	745	131	389	255	85	-	31	-	1634
	3	1900	165	603	149	497	91	40	-	3446
	4	4977	248	63	78	-	158	-	-	5524
	all	2658	160	412	149	158	91	109	1	3739
	percentages	71.1	4.3	11.0	4.0	4.2	2.4	2.9	-	100

N.B. Additions in column "All" do not tally exactly due to rounding

I crop production
II animal husbandry
III wages and salaries agriculture
IV wages and salaries non-agriculture
V pensions
VI remittances
VII non-agricultural household enterprise
VIII others

Table 8.3 shows in addition that it is not just the difference in build-up of the migrant population from the different strata that caused the difference in distribution of sources of income. After weighting the migrants income figures per stratum with the stratum populations of the non-migrants we still find a significantly different pattern of source distribution of income with the migrants as compared with the non-migrants.

Table 8.3 Distribution of income according to source, migrants and non-migrants in Semlar panchayat (migrants' average incomes weighted with non-migrants strata populations)

Sources 1/	I	II	III	IV	V	VI	VII	VIII	All
Migrants	38.2	10.3	9.9	30.7	2.8	5.1	3.0	-	100
Non-migrants	71.1	4.3	11.0	4.0	4.2	2.4	2.9	-	100

1/ For explanation of codes, see table 8.2

Investigations into difference in labour participation rates and gross income per area harvested did not yield any consistent results.

9. Summary and Conclusions

In the first part of 1974 a village survey was conducted by the Asian Regional Team for Employment Promotion in eight Nepali villages. For this purpose a local body, the Rural Household Survey Board, was set up to direct operatic The survey was supposed to supply data on rural income levels and the economic activities from which these were derived. Four villages in the Hilly parts of Nepal and four in the Terai belt were purposively selected. A complete enumeration of households in these villages followed and a stratified sample was drawn on the basis of this.Criterium for stratification was the excess to land for cropping. Irrigated land was therefore given double weight. Out of a total of 4844 enumerated households thus 496 were selected to respond to a detailed questionnaire on assets, family status and income.

Findings

Per capita incomes are low, NRs 308 net in the Hills and NRs 420 net in the Terai.Lower strata of households show levels somewhat below NRs 300 net per annum. These strata represent 85% of the survey population in the Hills. High per capita incomes are found to be concentrated in the highest Terai stratum (1.70 Ha or more of cultivated + irrigated land). Low per capita incomes are not particularly concentrated.

Distribution of income is more skewed in the Terai than it is in the Hills. This goes with a higher concentration of land among cultivators in the Terai.

The (net) non-wage income per day of an adult equivalent family worker depending on non-wage activities was found to be about NRs 2 in the Hills and NRs 4 in the Terai, including 11% in the Hills and 7% in the Terai of transfers and property income. Compared with this the average wage earned in the Hills was NRs. 2.74 per day and NRs. 4.38 in the Terai. This shows that labour productivity in the so-called own-account activities is extremely low If cost for own investments is imputed it can be shown that onw-account workers earn less than wage workers. If instead a reasonable wage for own-account workers is imputed, we would find that investments in agriculture are very unproductive in terms of money. In terms of the product, food, however, it means survival.

In a regression analysis cultivated area and irrigated area of land appeared to be explanatory variables on level of income, the coefficient being higher in the Hills than in the Terai. The coefficient for additional equivalent workers is too low to consider them fully and productively employed. In the Terai caste membership explained part of the income differentials. Cropping pattern and yield levels as these were found to vary in the survey are rather unrelated to household income. Throughout, dependence on self-employment has a negative impact on income. Among landless households male headed ones are better off.

As for different sources of income animal husbandry and agricultural wages and salaries are found to be relatively more important in Hills and Terai respectively. The biggest contribution in both areas, however, is still from crop production. In the Hills almost all households have more than one source of income while in the Terai this is the case in 9 out of 10 households. Lower strata, that is to say landless and small farmers, naturally derive relatively more of their income from other sources than crop production. Non-agricultural wages and salaries predominate in the Hills whereas in the Terai these earnings are mostly derived from agriculture. In strata 2,3 and 4 (three highest strata out of five on the basis of cropping potential) in the Hills crop production, animal husbandry and non-agricultural wages and salaries are the order of importance of income sources. In the Terai the order fluctuates according to stratum. Overall, compensatory effects from wages and salaries for low incomes from small holdings are greatest. The lowest income households in the Hills derive most of their income from crop production, so do the highest income households. In the Terai the lowest income households earn most in the form of agricultural wages and salaries while the highest are also mainly crop income earning. A second important income source for higher income Hill households is non-agricultural wages and salaries.

In the Hills 96% of the farms are mixed, i.e. these grow crops and keep livestock. In the Terai this group counts for 72% of the farms. Hardly any Hill households are non-agricultural and only 12% of the Terai households do not farm on own account. Share of livestock in total farm income differs considerably per location. It further tends to increase with potentially cropped area. Large farmers have relatively more livestock.

Cropping pattern in the survey was not representative for the regions from where the sample villages were taken. Yields were significantly higher in the Hills and the yield of maize interplanted with soyabeans was shown to be higher than maize grown without. It was not clear whether yields dropped as size of holding increased.

On the Hill farms one finds on the average 7.5 adult equivalent family workers per Ha with 0.8 such workers per Ha for the Terai. In the Hills in addition to that 104 days per Ha is spent by casual hired labour against 30 days in the Terai. Here, there are hardly differentials between strata.

Cost structure incrop farming appeared the same for Hills and Terai, ten percent direct cost and 25% indirect cost with the remainder as remuneration for family labour and capital.

In the Hills there is relatively a smaller area irrigable but double cropping is more common. In both regions bigger farmers had relatively more irrigable area but double cropping was practiced as often by big farmers as by small farmers.

From a regression analysis on crop income it was found that increase in size of holding would have a positive effect on average land productivity in the Terai but a negative effect in the Hills. Land reform in the Hills is under present conditions therefore preferable if we look at the land productivity criterium. Cost factors appeared to be negatively related to crop income which points at inefficient operations.

Buffaloes and cows are the main livestock producers. Cows are much less productive than buffaloes. Buffaloes tend to yield more with bigger farmers. In fact, total gross income out of livestock per unit of livestock is higher for bigger farmers.

Family labour in agriculture earns often less than agricultural labourers who are underemployed. Use of agricultural labourers is more concentrated on big Terai farms where the economics are somewhat reverse. Overall labour productivity in the Terai is higher but for the small land holdings the Hills show a better record. Number of ares per adult equivalent worker ranges from 8 to 27 in the Hills and from 24 to 160 in the Terai.

Wage and salary earners were found to be employed for an average 163 days in bot regions. In the Terai proportionally more households participate in wage and/or salary earning and in the Hills the number of workers per household is relatively higher. In this category of income non-agricultural jobs prevail in the Hills whereas agriculture is the main wage and salary earner in the Terai. It was interesting to note that agricultural employment was almost full time whereas porterage in the Hills and all types of miscellaneous jobs in the Terai offered only temporary employment. The rate is at least NRs 1 per day higher in the Terai than in the Hills. In the survey cash payments appeared to be more common in the Hills. From Syangja district an important proportion of wage and salary earners got their income from outside the district.

The Hill households had on the average 2.77 adult equivalent workers whereas the Terai households did with 2.00 on the average only. Number of workers per household went up by stratum very clearly in both regions. Levels of unemployment in the sense of low productivity employment tend to be very high in lower Terai strata. This is reviewed against local average labour productivity. This is twice as low in the Hills as it is in the Terai. Thus, this marks the major structural problem, a too high population density in the Hills. Low productivity in the Terai can only partly be offset by existing techniques among the farmers.

For one village (Semlar) comparison between recently migrated and other households could be made. It appeared that migrated households - from the Hills to the Terai - were larger in size. Migrants in the lower farm size strata earn more than other households. Migrants also earn relatively more from wages, salaries and animal husbandry.

Conclusions

The survey yielded a quite comprehensive picture of income, employment and production at household level and thus could be used as a benchmark towards which future developments can be measured.

The overall picture then reveals startling poverty almost throughout the village community. The productivity levels in agriculture are very low. There is hardly a start made with increase in these low levels and negative correlation between input levels and gross income in crop production suggest that currently developments are into the wrong direction. Manpower is greatly underutilized. Household enterprises yield lower remuneration per time spent as compared to wage jobs. A major effort to increase productivity on household enterprises is needed. Immediate scope for improvement should be found in the Terai where crop and animal husbandry production both are characterised by extreme low per unit levels of productivity. In the Hills there is an increase in average productivity to be expected from land reform measures. The potential for increase in productivity in agriculture is also present in the Hills but immediate measures will most probably have to be looked for in the direction of finding employment outside this region.

A number of more detailed actions could be derived from the results of this study but these are not treated here as it is felt that the relevant chapters should be consulted if such use of this survey report is intended. All measures should be clearly directed towards improved use of the excess of human resources available in rural Nepal.

In a number of cases in the report it has been suggested to investigate certain details more carefully. This reflects indeed the limitation of this exercise. It points to areas where tasks for development lie clearly barren but it cannot lead to programmes unless the cases are saparately examined. After a type of survey like this which "reveals" a situation in fact already widely perceived time has come for what could be called stratified purposive sample surveys on certain topics making use of a maximum of local knowledgable information sources. If a list of areas for such surveys should be compiled we may mention some here on the basis of this report:

- double cropping under un-irrigated conditions
- yield increase potential in cropping with interplanting (like the maize/soyabean combination)
- buffalo breeding
- porterage economy in the Hills
- suitability of practices in crop production in the Hills for application in the Terai
- response on inputs in crop production.

This is first a short list because it only points to solutions and relationships found within the household differentials. The absolute low level of living as compare to modern societies points to the need for drastic measures introduced from outside the system if indeed modernization along the lines of most of the nations in this twentieth century's world is an objective of the Nepali society. If such measures are taken this account may be only of historical value.

ANNEX 1

Rural Population and number of Panchayats in different regions in Nepal

Regions	Mountains			Hills			Terai and Inner Terai		
	Pop	Panch.	Pop. / Panch.	Pop.	Panch	Pop. / Panch	Pop.	Panch.	Pop. / Panch
Far West	55242	40	1381	1778886	630	2824	569539	172	3311
West	231755	108	2146	1611630	621	2595	565023	208	2716
Centre	353923	133	2661	1180856	386	3059	2037924	700	2911
East	304352	130	2341	985669	358	2753	1419246	437	3248
Nepal	945272	411	2300	5557041	1995	2789	4591732	1517	3027

Sources: Census 1971, CBS. Kathmandu

The classification of districts according to geographical region was done on the basis of table 1 of Part A of the Reconnaissance Survey of the U.N. - H.M.G. Nepal Road Feasibility Study by Comtec in collaboration with Alpina and Macchi, Kathmandu, Dec. 1970.

Annex 2

General Village Panchayat Schedule

1. Name of village panchayat
2. District
3. Names of villages included in village panchayat:

(i)	(iv)
(ii)	(v)
(iii)	(vi)

4. Distance of village panchayat from District headquarters

Is the connection to the District headquarters by road or by track?

road / track

What is the condition of the road or track?

paved / improved / mud/passable by horse and donkey / mud/not passable by horse and donkey

What is the main means of transport to the District headquarters.

4. No. of households who left this place on a long-term basis during 1973

Name of Village	Number
village (i)	
village (ii)	
village (iii)	
village (iv)	
village (v)	
village (vi)	
Total	

6. In which way is measurement of land generally done in this village panchayat?

Please list the units of land measurement in use in the village panchayat.

Unit Area in metric system

7. How is weighing generally done in this village?

Please list the units of weight in use in the village panchayat.

Product	Unit	Weight in (kilo)grams or volume in litres
wheat		
rice		
maize		
milk		
curd		
wey		
ghee		

8. Did the village panchayat produce enough foodgrains for its requirements during 1973? yes ☐ No ☐

And how about 1972? yes ☐ No ☐

1971? yes ☐ No ☐

1970? yes ☐ No ☐

If fluctuation in situation, please explain

9. Prices in the village panchayat

Commodities	Units	Price/unit
wheat		
rice		
maize		
potatoes		
ghee		
fish		
skin		
manure		
eggs		
wool		
fertilizer		
pesticides		

10. Forms of wage payment (rate per day) for different groups of labourers:

Group	Rate per day in V.P.	Outside V.P. in "town"
Male adults		
Female adults		
Children (< 16 yrs.)		

11. Has a technician of the extension service ever visited the village panchayat?

yes ☐ no ☐

12. Are any of the following institutions or government projects to be found here or nearby?

Item	yes	no	Distance from the V.P.	Year of establishment
Cooperative Credit Society				
Commercial Bank				
Market				
School in village panchayat				
Health service				
Road construction				
Any other project (specify)				

13. How many new houses were constructed in the VP in 1973?

Village	Number of new houses constructed
(i)	
(ii)	
(iii)	
(iv)	

Village	Number of new houses constructed
(v)	
(vi)	
	Total

Name of person filling the schedule:

Names of respondents	Date of filling the schedule

Annex 3

Household Listing and Stratification Schedule

District

1. Name of Village Panchayat
2. Name of Village
3. Serial No. of household in the Panchayat list
4. House No. or other identification
5. Name of head of the household

Sex M / F

Age

Marital status: single / married / divorced / widow/widower

Caste

Principal occupation

6. (a) Does the household own land? yes / no

   (b) If yes, how much?

   Total ..... khet ..... Pakho .....

7. (i) Socio-economic status based on land:

   (a) Owner-cultivator renting out land (landlord) ☐

   (b) Owner-cultivator (neither renting out nor renting in land) ☐

   (c) Owner-cum-tenant cultivator ☐

   (d) Tenant cultivator not owning any land ☐

   (e) Landless wage-earner or craftsman not cultivating land ☐

   (f) Landless but engaged in trading and money-lending ☐

(ii) If the household cultivated land in 1972-73 did it produce

(a) enough foodgrains for its own need, but no surplus to sell

yes ☐ no ☐

(b) not enough foodgrains for its own need

yes ☐ no ☐

(c) enough foodgrains for its own need with a saleable surplus

yes ☐ no ☐

8. Which kind of animals are kept by the household?

Buffaloes ☐	sheep ☐	poultry ☐
bullocks ☐	goats ☐	others ☐
cows ☐	pigs ☐	specify
horses ☐		

9. (a) Did the household move into this village within the last five years (after 1968)?

yes ☐ no ☐

If yes, when did the household move? Year

Month

And was the previous residence outside this district?

yes ☐ no ☐

If yes, in which district did the household live previously?

(b) During the last five years (since 1968) has somebody previously a member of the household migrated from here to another district and has been staying there for more than one year?

yes ☐ no ☐

Name of person filling the schedule:

Date of filling the schedule:

Name of respondent and his/her relationship to household head:

Total Number of Households and the Sample Size in Each Stratum

LOCATION	1			2			3			4			0			Total			LOCATION	
	T	S	T/S	T	S	T/S	T	S	T/S	T	S	T/S	T	S	T/S	T	S	T/S		
1 Mathurapathi	206	15	13.7	119	12	9.9	52	6	8.7	52	8	6.5	0	0	-	429	41	10.5	Mathurapathi	1
2 Sarsiyukhark	364	34	10.7	247	13	19.0	71	9	7.9	57	13	4.4	5	5	1.0	744	74	10.1	Sarsiyukhark	2
Kabhre	570	49	11.6	366	25	14.6	123	15	8.2	109	21	5.2	5	5	1.0	1173	115	10.2	Kabhre	
7 Tulsi Bhanjyang	429	35	12.3	79	5	15.8	14	8	1.8	13	11	1.2	4	4	1.0	539	63	8.6	Tulsi Bhanjyang	7
8 Pauway Gaude	283	22	12.9	108	13	8.3	31	5	6.2	25	5	5.0	3	3	1.0	450	48	9.4	Pauway Gaude	8
Syangja	712	57	12.5	187	18	10.4	45	13	3.5	38	16	2.4	7	7	1.0	989	111	8.9	Syangja	
Hills	1282	106	12.1	553	43	12.9	168	28	6.0	147	37	4.0	12	12	1.0	2162	226	9.6	Hills	
3 Bijalpura	100	24	4.2	116	12	9.7	147	10	14.7	184	7	26.3	340	41	8.3	887	94	9.4	Bijalpura	3
4 Itaharawa	57	16	3.6	26	6	4.3	36	5	7.2	38	4	9.5	106	13	8.2	263	44	6.0	Itaharawa	4
Mahottari	157	40	3.9	142	18	7.9	183	15	12.2	222	11	20.2	446	54	8.3	1150	138	8.3	Mahottari	
5 Semlar	81	20	4.1	134	14	9.6	294	15	19.6	409	17	24.1	164	18	9.1	1082	84	12.9	Semlar	5
6 Raybapur	41	12	3.4	101	10	10.1	201	12	16.8	96	9	10.7	11	5	2.2	450	48	9.4	Raybapur	6
Rupandehi	122	32	3.8	235	24	9.8	495	27	18.3	505	26	19.4	175	23	7.6	1532	132	11.6	Rupandehi	
Terai	279	72	3.9	377	42	9.0	678	42	16.1	727	37	19.6	621	77	8.1	2682	270	9.9	Terai	
Grand Total	1561	178	8.8	930	85	10.9	846	70	12.1	874	74	11.8	633	89	7.1	4844	496	9.8	Grand Total	

T = total number of households

S = number of households in the samples

Annex 5 Conversion rates of local area units into ares (1 are = 0.01 ha)

Locality	Local Unit	in ares
HILLS		
Kabhre	ropani	5.1
	hale	6.8
	muri mato	1.28
	pathi mato	0.064
	kodale	3.1
	pathi began (low land)	2.9
	manna began (low land)	0.36
	muthi began (low land)	0.036
	pathi began (upland)	14.7
	manna began (upland)	1.84
	muthi began (upland)	0.184
Syangja	ropani	5.1
	hale	6.8
	anna	0.32
	paisa	0.080
	kodale	3.1
	pathi began (low land)	3.7
	manna began (low land)	0.46
	muthi began (low land)	0.046
	pathi began (upland).....	11.0
	manna began (upland)	1.38
	muthi began (upland)	0.138
	unit	in ares
TERAI		
	bigha	67.7
	Khatta	3.39
	dur	0.169

Source: Statistics section of Food and Agriculture Marketing Services Department, TABLES OF CONVERSION FACTORS, converting areas of local units of land measurements in non-cadasterally surveyed districts into uniform standard units of ropani (excluding districts of the Himalayan Region)

Annex 6 Main conversion rates on weight and volume of commodities.

1 muri = 20 pathis; 1 pathi = 8 manna; 1 dharni = 12 pau;

1 hap = 7 manna; 1 maund = 40 seers or 8 paseri (Terai).

Commodity	Local Unit	Weight in kg.
barley	1 muri	45.36
soyabean	1 muri	63.5
wheat, maize	1 muri	68.04
paddy	1 muri	48.765
millet	1 muri	65.77
mugi, gahat (kurthi), siltung, masyang	1 muri	72.58
khesari, rahar	1 muri	67.90
groundnuts	1 muri	24.8
pindalu	1 muri	60
ghee	1 muri	60
milk	1 muri	91
gram (chana)	1 muri	65.77
mustard seed	1 muri	56.70
all commodities	1 maund	37.3242
all commodities	1 dharni	2.393
all commodities	1 seer (Hills)	0.8

Annex 7

Estimate on Value of Manure Used for Dung Cakes in the Terai

Livestock inventory at the time of the survey and value of manure used

Hill villages*	Cows (1.0)**	Buffaloes (1.25)**	Goats/sheep/pigs (.25)**	Chickens (.05)**	Total livestock units (A)	Value of manure used (NRs) (B)	Manure per livestock unit (NRs) (B) ÷ (A)
1	99	38	87	99	174	2725	16
2	205	69	188	222	349	7425	21
7	177	184	107	64	437	4458	10
8	47	82	42	124	167	6272	38
						Average	19
Terai villages*							
3	159	9	48	76	186	1967	11
4	46	7	24	-	61	966	16
5	177	89	116	170	326	1332	4
6	124	39	21	-	178	3488	20
						Average	10

* Villages code on p 6

** Number of livestock units per animal in respective categories.

From the above figures it appears that in the Terai per livestock unit NRs. 9 less worth of manure has been used as compared to the Hill villages. Assuming that these nevertheless have been produced but used as dung cakes and consequently have not been reported 9 X 751 (total number of livestock units in the Terai) = NRs. 6759 has to be added to the Terai households' incomes. This means 6759 ÷ 270 (the sample in the Terai villages) = NRs. 25 per household or 1% as the average per household income in the Terai villages is NRs. 2393.

Annex 8

Number of Persons per Household

Villages	Strata 0	1	2	3	4	All
Mathurapathi (1)	-	3.9	5.5	5.8	8.6	5.1
Sarsiyukhark (2)	3.2	4.6	7.2	11.2	9.0	6.4
Villages from Kabhre district (1+2)	3.2	4.3	6.6	9.0	8.8	5.9
Tulsi Bhanjyang (7)	1.8	4.3	7.0	8.4	10.9	5.0
Pauway Gaude (8)	5.0	4.1	5.5	7.6	6.0	4.8
Villages from Syangja district (7+8)	3.1	4.3	6.1	7.8	7.7	4.9
Hill villages (1+2+7+8)	3.2	4.3	6.4	8.7	8.5	5.5
Bijalpura (3)	4.4	4.7	5.3	5.0	6.7	5.1
Itaharawa (4)	5.4	4.9	5.0	5.6	6.0	5.4
Villages from Mahottari district (3+4)	4.7	4.8	5.2	5.1	6.6	5.2
Semlar (5)	4.4	4.9	4.2	6.2	8.0	6.3
Raybapur (6)	3.4	3.7	5.2	5.7	6.9	5.6
Villages from Rupandehi district (5+6)	4.3	4.5	4.6	6.0	7.8	6.1
Terai villages (3+4+5+6)	4.6	4.7	4.9	5.8	7.4	5.7
All villages	4.5	4.4	5.8	6.3	7.6	5.6

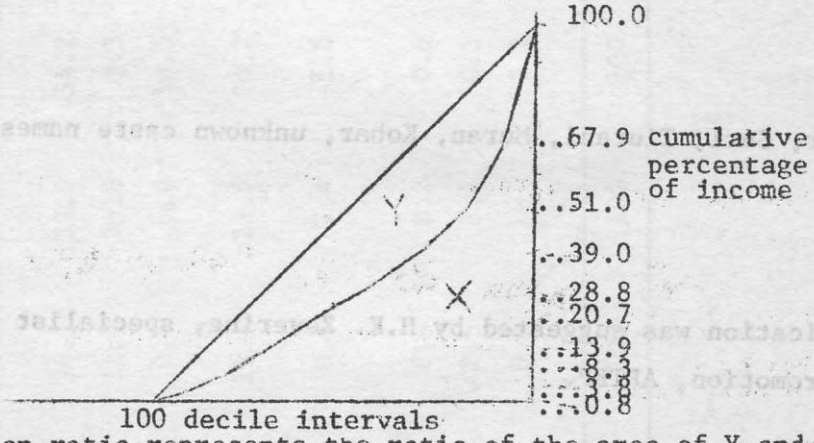
Annex 9

Example of calculation of Gini concentration ratio

We use the data on distribution of household income in the Hill villages:

Deciles	1	2	3	4	5	6	7	8	9	10
Perc. of households	9.9	10.2	9.9	9.8	10.1	9.8	10.1	10.0	10.0	10.0
Cumulative perc. of income	0.8	3.8	8.3	13.9	20.7	28.8	39.0	51.0	67.9	100.0

In a graph these data can be presented as follows:



The Gini concentration ratio represents the ratio of the area of Y and the area of the whole triangle.

The area of the whole triangle is equal to ½ x 100 x 100 = 5000

The area of Y is the area of the whole triangle minus the area of X.

The area of X is equal to ½ x 9.9 x 0.8 + ½ x 10.2(0.8+3.8) +½ x 9.9(3.8+8.3) + ½ x 9.8 (8.3 + 13.9) + ½ x 10 (13.9 + 20.7) + ½ x 9.8 (20.7 + 28.8) + ½ x 10.1 (28.8 + 39.0) + ½ x 10 (39.0 + 51.0) + ½ x 10.2 (51.0 + 67.9) + ½ x 10 (6.7+100) = 2849.93.

The area of Y is equal to 5000 - 2849.93 = 2150.07

Gini concentration ratio is $\frac{2150.07}{5000}$ = 0.43

Annex 10. For the "caste" variable the followingclassification has been used:

(1) Brahmin, Bhumihar, Chhetri, Rajput, Thakuri

(2) Newar

(3) Kurmi, Kuwat (or Kewat), Dhanuk, Muniya or Luniya, Das

(4) Koiri, Haluwai, Hajam, Badhai, Lohar, Yadav, Darji

(5) Kalwar, Teli, Dholi Kumhar

(6) Mushar, Chamar, Dhusad or Dusadh

(7) Kami, Lama, Damai, Sonar or Sunar, Sarhi, Gharti

(8) Magar, Tamang, Gurung, Rai

(9) Tharu

(10) Moslim

(11) Verihar, Suri, Tiurani, Muran, Kohar, unknown caste names.

This classification was suggested by H.K. Zevering, specialist Rural Employment Promotion, ARTEP.

Annex 11

Distribution of income by source per survey village in the Hills* (%)

Location**	1	2	7	8	1+2	7+8	All Hill villages
Crop production	64.8	49.9	38.1	33.4	54.2	35.8	45.2
Animal Husbandry	2.8	11.9	31.7	23.8	9.3	27.9	18.4
Agricultural wages and salaries	18.6	18.5	0.6	0.4	18.5	0.5	9.7
Non-agricultural wages and salaries	11.7	15.2	19.4	23.5	14.2	21.4	17.7
Non-agricultural household	0.5	1.2	0.4	2.4	1.0	1.4	1.2
Pensions	1.6	0.2	6.9	8.2	0.6	7.6	4.0
Remittances	-	0.1	2.5	8.2	0.1	5.3	2.6
Other sources	-	3.0	0.3	-	2.2	0.2	1.2
Total	100	100	100	100	100	100	100

* Positive contributions only

** Codes of villages on page 6

Annex 12

Distribution of income by source per survey village in the Terai*(%)

Location**	3	4	5	6	3+4	5+6	All Terai villages
Crop production	39.5	38.3	59.3	83.7	39.2	64.4	57.0
Animal husbandry	1.2	0.5	5.9	-	1.0	2.5	2.1
Agricultural wages and salaries	47.1	32.3	12.1	-	43.0	10.7	20.1
Non-agricultural wages and salaries	7.5	25.9	12.0	15.7***	12.6	12.9	12.8
Non-agricultural household enterprise	4.7	1.7	3.8	0.6	3.8	3.5	3.6
Pensions	-	1.2	3.8	-	0.3	3.4	2.5
Remittances	-	-	3.0	-	-	2.7	1.9
Other sources	-	-	-	-	-	-	-
Total	100	100	100	100	100	100	100

* Positive contributions only

** Codes of villages on p. 6

*** Source of wages and salaries in this village was often not mentioned.

Annex 13

Distribution by Source of Per Capita Income within each stratum in the Hills

S. No.	Source of income	Stratum 0 NRs.	0 % of total	1 NRs.	1 % of total	2 NRs.	2 % of total	3 NRs.	3 % of total	4 NRs.	4 % of total	All Strata NRs.	All Strata %of total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.	Crop production	0.0	0.0	88.7	30.2	157.0	51.0	193.6	66.2	249.0	64.3	139.0	45.2
2.	Animal husbandry	-23.1	N-1/	61.5	21.0	53.1	17.2	41.3	14.1	65.7	16.9	56.6	18.4
3.	Agricultural wages and salaries	31.6	10.6	38.5	13.2	30.7	9.9	14.2	4.8	7.6	2.0	29.8	9.7
4.	Non-agricultural wages and salaries	137.8	46.2	81.9	28.0	31.2	10.1	20.3	6.9	37.4	9.6	54.5	17.7
5.	Non-agricultural household enterprise	66.0	22.1	3.2	1.1	3.0	1.0	6.0	2.0	2.3	0.6	3.6	1.2
6.	Pensions	0.0	0.0	9.5	3.2	17.3	5.6	2.0	0.7	23.4	6.0	12.4	4.0
7.	Remittances	63.2	21.1	8.7	3.0	7.1	2.3	13.0	4.4	1.1	0.3	8.1	2.6
8.	Other sources	0.0	0.0	0.9	0.3	9.1	2.9	2.7	0.9	1.2	0.3	3.6	1.2
	All sources	275.5	100.0	292.9	100.0	308.5	100.0	293.1	100.0	387.7	100.0	307.6	100.0

1/ = Negative

The net contribution of source No.2, which is negative for stratum 0, is shown in col. 3 but is omitted while calculating the percentage distribution in col. 4

Annex 14

Distribution by Source of Per Capita Income within Each Stratum in the Terai

S.No.	Source	Stratum 0		1		2		3		4		All Strata	
		NRs	Per cent of total	NRs	Per cent of total	NRs	Per cent of total	NRs	Per cent of total	NRs	Per cent of total	NRs.	Per cent of total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.	Crop production	0.0	0.0	36.0	12.1	91.0	31.2	207.3	54.9	488.9	82.3	240.1	57.0
2.	Animal husbandary	-17.6	N [1/]	-3.5	N [1/]	6.8	2.3	1.4	0.4	31.3	5.3	8.7	2.1
3.	Agricultural wages and salaries	218.7	71.4	189.3	63.1	97.3	33.4	53.5	14.2	6.5	1.1	84.3	20.1
4.	Non-agricultural wages and salaries	58.2	19.0	32.7	11.0	49.9	17.1	60.1	15.9	53.4	9.0	53.8	12.8
5.	Non-agricultural household enterprise	29.4	9.6	38.8	12.9	35.3	12.1	7.6	2.0	0.2	0.0	15.0	3.6
6.	Pensions	0.0	0.0	2.1	0.7	11.5	3.9	30.8	8.2	2.9	0.5	10.5	2.5
7.	Remittances	0.0	0.0	0.0	0.0	0.0	0.0	16.6	4.4	10.7	1.8	8.0	1.9
8.	Other sources	0.0	0.0	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	All sources	288.7	100.0	296.0	100.0	291.8	100.0		100.0	593.9	100.0	420.4	100.0

1/ N = Negative

The net contribution of Source No.2, which is negative for Strata 0 and 1, is shown in cols. 3 and 5 but is omitted while calculating the percentage distribution in cols. 4 and 6.

Annex 15

Distribution by Source of Per Capita Income of the Bottom 10% and 30% and the top 10% and 30% of Persons in the Hills

S.No.	Source of income	Bottom 10%		Bottom 30%		Top 30%		Top 10%		All households	
		NRs.	Per cent of total	NRs.	Per cent of total	NRs.	Per cent of total	NRs.	Per cent of total	Nrs.	Per cent of total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.	Crop production	27.3	70.1	60.3	60.4	217.5	36.7	250.8	29.2	139.0	45.2
2.	Animal husbandry	-9.4	N 1/	3.7	3.7	124.6	21.0	150.8	17.5	56.6	18.4
3.	Agricultural wages and salaries	6.3	16.1	25.7	25.7	25.2	4.3	19.6	2.3	29.8	9.7
4.	Non-agricultural wages and salaries	3.1	7.9	7.2	7.2	146.0	24.7	259.5	30.2	54.5	17.7
5.	Non-agricultural household enterprise	2.0	5.1	1.1	1.1	5.2	0.9	5.0	0.6	3.6	1.2
6.	Pensions	0.0	0.0	1.3	1.3	36.8	6.2	80.1	9.3	12.4	4.0
7.	Remittances	0.0	0.0	0.0	0.0	26.9	4.5	67.7	7.9	8.1	2.6
8.	Other sources	0.3	0.8	0.6	0.6	9.9	1.7	26.1	3.0	3.6	1.2
	All sources	29.6	100.0	99.9 2/	100.0	592.1	100.0	859.6	100.0	307.6	100.0

1/ N = Negative

2/ The differerce with table 2.3b arises because in that table negative total incomes have been set at zero.

The net contribution of source No.2, which is negative for the bottom 10% of persons, is shown in col. 3 but is omitted while calculating the percentage distribution in col. 4.

Annex 16

Distribution by Source of Per Capita Income of the Bottom 10% and 30% and The Top 10% and 30% of Persons in the Terai

		Bottom 10%		Bottom 30%		Top 30%		Top 10%		All persons	
		NRs.	Per cent of total	NRs	Per cent of total	NRs	Per cent of total	NRs	Per cent of total	NRs	Per cent of total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.	Crop production	-33.1	N [1/]	33.1	34.7	585.8	66.2	943.7	74.9	240.1	57.0
2.	Animal husbandry	-45.5	N [1/]	-18.6	N [1/]	36.5	4.1	-6.9	N [1/]	8.7	2.1
3.	Agricultural wages and salaries	14.9	79.4	38.5	40.4	81.1	9.2	44.7	3.6	84.3	20.1
4.	Non-agricultural wages and salaries	2.9	15.7	21.8	22.9	110.6	12.5	161.7	12.8	53.8	12.8
5.	Non-agricultural household enterprise	0.9	4.9	1.9	2.0	17.0	1.9	41.3	3.3	15.0	3.6
6.	Pensions	0.0	0.0	0.0	0.0	34.7	3.9	39.2	3.1	10.5	2.5
7.	Remittances	0.0	0.0	0.0	0.0	19.7	2.2	28.5	2.3	8.0	1.9
8.	Other sources	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	All sources	-66.0	100.0	76.7 [2/]	100.0	885.4	100.0	1251.9	100.0	420.4	100.0

1/ N = Negative

The net contributions of sources 1 and 2, which are negative for the bottom 10% of persons, are shown in col. 3 but are omitted while calculating the percentage distribution in col.4. Similarly, for the net contribution of source 2 in cols. 5 and 6, as well as in cols. 9 and 10.

2/ The difference with table 2.3b arises because in that table negative total incomes have been set at zero.

Annex 17 Crops grown by one or more of the survey households.

Paddy	Groundnut	Khaini
Wheat	Groundnut/tori	Peas
Maize	Teel	Phaper
Chana (gram)	Bamboo	Muji
Kurthi (gahat)	Sweet potato	Musuri
Millet	Potato	Arhar
Soyabean	Pulse (mas)	Onion
Barley	Halledo	Sugarcane
Mustard	Siltung (Masyang)	Pindalu
Khesari and rahar	Tobacco	Aksa

Annex 18 Average price of main crop's main product (maize grains in the Hills and paddy grains in the Terai) per stratum per village panchayat. (Rs/kg)

PANCHAYAT	STRATUM				TOTAL
	I	II	III	IV	
1	1.38	1.35	1.32	1.26	1.32
2	1.40	1.55	1.44	1.39	1.48
7	1.49	1.47	1.47	1.48	1.48
8	1.47	1.52	1.48	1.47	1.48
HILLS	1.45	1.51	1.44	1.37	1.46
3	1.34	1.34	1.33	1.34	1.34
4	1.38	1.34	1.34	1.39	1.38
5	1.67	1.67	1.61	1.57	1.58
6	1.31	1.24	1.27	1.32	1.30
TERAI	1.48	1.51	1.53	1.48	1.49

Annex 18a Calculation of index of cropping pattern

For calculation of the index of cropping pattern the following crops were considered:

Terai	Hills
Paddy	Paddy
Wheat	Wheat
Maize	Maize
Finger millet	Maize/Soyabeans
Other crops	Finger millet
	Other crops

First, the distribution of harvested area of these crops in the survey villages was calculated in percentages of the total harvested area. Then the average gross margin per are [1/] harvested for these crops in both regions was computed on the basis of the survey data. The results were as follows:

	Crops	Percentage of total harvested area		Average gross margin per are[1/]	
		Terai	Hills	Terai	Hills
1.	Paddy	53	24	15	43
2.	Wheat	14	18	8	11
3.	Maize	10	26	5	29
4.	Maize/Soyabeans		16		46
5.	Finger millet	3	8	4	40
6.	Other crops	21	8	5	31
	Total	101 [2/]	100		

For each crop and for both regions separately the percentage figure was multipled by the gross margin and the summary calculated for each region, in letter notation

$$\sum_{i}^{6} x_i y_1$$ where x_i = percentage of total harvested area yielding i

y_i = gross margin in NRs of one are of crop i

(N.B. Crop 4 is not singled out for the Terai and does therefore not continue)

1/ In NRs; 1 are = 10x10 metres

2/ Not 100 due to rounding

A similar calculation was carried out for each household in Hills and Terai making use of average gross margins per are. Then for each household the ratio of the household's summary over the overall summary in the region was used as explanatory variable in the crop income regression.

Annex 19. Milk production per Buffalo (B) and Cow (C)

HILLS

S		PANCHAYAT				TOTAL
		1	2	7	8	
0	B	-	-	20	-	20
	C	-	-	-	-	-
1	B	-	438	265	307	281
	C	-	288	57	-	164
2	B	468.00	204	203	612	419
	C	161	165	44	-	138
3	B	531.00	1320	298	263	527
	C	-	102	28	-	52
4	B	913	1074	260	409	707
	C	84	219	11	196	143
TOTAL	B	677	840	253	411	374
	C	130	231	50	196	144

TERAI

S		PANCHAYAT				TOTAL
		3	4	5	6	
0	B	-	-	-	-	-
	C	143	-	251	-	166
1	B	-	-	240	-	240
	C	-	-	94	18	47
2	B	-	-	370	417	382
	C	- 1/	-	63	-	63
3	B	-	-	306	249	289
	C	104	-	140	84	126
4	B	327	313	630	352	572
	C	-	-	137	375	180
TOTAL	B	327	-	549	320	498
	C	131	313	132	212	144

1/ One case of exceptional high yield omitted.

Annex 20. Kinds of feed distinctly coded

Maize flour	Salt
Millet flour	Kerao 1/
Paddy straw	Bhusa 1/
Wheat straw	Khesari 1/
Millet straw	Khari 1/
Mustard straw	Gunda 1/
Straw and maize stalks	Dhuto 1/ and bhus 1/
Soyabean straw	Pina 1/
Paddy bran	Maize

1/ Local name

Annex 21 Income and adult equivalent workers in households with wages as only income source

Panchayat	number of households	income	A.E.W.'s	equivalent in days	days worked	wage income per worker	"un-cum under-employment" (%) 1/
2	2	500	1.0	300	300	500	0
7	2	720	0.8	240	300	900	-25
Hills (weighted)	4	1220	1.8	540	600	678	-11
3	17	24058	26.2	7860	4590	918	42
4	6	7245	9.4	2820	2010	771	29
5	4	5280	6.9	2070	1440	765	30
6	4	2460	4.6	1380	850	535	38
Terai (weighted)	235	312550	367.45	110235	69553	851	37

1/ This "un-cum under -" employment percentage is 100 (1-r) where r is the ratio of the number of days worked and the number of days available assuming that one adult equivalent worker can deliver 300 days of work. It thus expresses per aggregate (village-wise) of households solely dependent on wages for their income the un-and underemployment simultaneously.

Annex 22. Number of landed households per decile of agricultural income and total household income (HILLS)

Deciles		Agricultural Income 1	2	3	4	5	6	7	8	9	10	all
	1	9	2	2	-	2	2	-	-	1	1	19
	2	2	5	4	1	4	1	1	-	1	-	19
Household	3	2	3	1	6	5	-	1	-	1	-	19
	4	1	1	5	-	1	2	5	2	1	-	18
Income	5	1	3	3	4	1	4	1	1	-	1	19
	6	1	-	-	2	3	1	5	5	-	1	18
	7	-	1	2	5	1	2	3	3	2	2	21
	8	1	1	-	-	1	2	2	5	4	3	19
	9	-	-	-	-	-	2	1	-	15	13	31
	10	-	1	1	1	-	2	-	3	2	20	30
	all	17	17	18	19	18	18	19	19	27	41	213
	x	11	10	10	10	5	7	10	8	21	33	125
x as perc of all observations		65	59	56	53	28	39	53	42	78	80	59

x is the number of observations in same and vertically adjacent strata.

Annex 23. Number of landed households per decile of agricultural income and total household income (TERAI)

Deciles		Agricultural Income 1	2	3	4	5	6	7	8	9	10	all
	1	9	7	1	3	-	-	2	-	-	-	22
	2	5	6	4	2	3	3	-	-	1	-	24
	3	9	5	5	3	2	-	-	-	-	-	24
	4	6	2	3	2	4	-	-	1	-	-	18
Household	5	3	6	4	3	1	1	-	-	-	-	18
	6	6	3	3	1	2	3	1	1	-	-	20
Income	7	6	2	1	1	2	1	5	-	-	-	18
	8	1	3	1	-	-	3	3	3	3	-	17
	9	1	1	1	1	-	-	2	5	4	2	17
	10	-	-	-	2	-	2	-	2	1	8	15
	all	46	35	23	18	14	13	13	12	9	10	193
	x	14	18	12	8	7	5	9	8	8	10	99
x as perc. of all observations		30	51	52	44	50	38	69	67	89	100	51

x is the number of observations in the same and vertically adjacent strata.

Annex 24 Percentages adult equivalent workers in wages and salaries employment according to village [1/]

1	2	7	8	Hills
16	21	8	13	16

3	4	5	6	Terai
35	50	23	8	25

1/ For village codes see p.6

Annex 25

Wage rate (salaries not included) in the Hills

	0	1	2	3	4	all (weighted)
1 receipts	-	8603	3667	560	-	159036
days	-	2957	1400	130	-	55502
wage rate	-	2.91	2.62	4.31	-	2.87
receipts [1]	-	12203	5040	598	-	222279
wage rate [1]	-	4.13	3.60	4.60	-	4.00
2 receipts	4820	23600	6780	2910	5580	433701
days	2100	9030	2670	1050	1560	164610
wage rate	2.30	2.61	2.54	2.77	3.58	2.63
receipts [1]	5720	35930	10695	4035	5805	650795
wage rate [1]	2.72	3.98	4.01	3.84	3.72	3.95
7 receipts	1470	1155	-	0	0	15677
days	600	285	-	-	-	4106
wage rate	2.45	4.05	-	-	-	3.82
8 receipts	150	1650	50	200	0	23090
days	60	330	30	300	-	6426
wage rate	2.50	5.00	1.67	0.67	-	3.59
Hills receipts	6440	405873	165538	29101	24552	631504
(weighted) days	2760	144894	64839	11286	6864	230643
wage rate	2.33	2.80	2.55	2.58	3.58	2.74
receipts [1]	7340	587124	253516	38319	25542	911841
wage rate [1]	2.66	4.05	3.91	3.40	3.72	3.95

1) Taken into account food distribution in Kabhre.

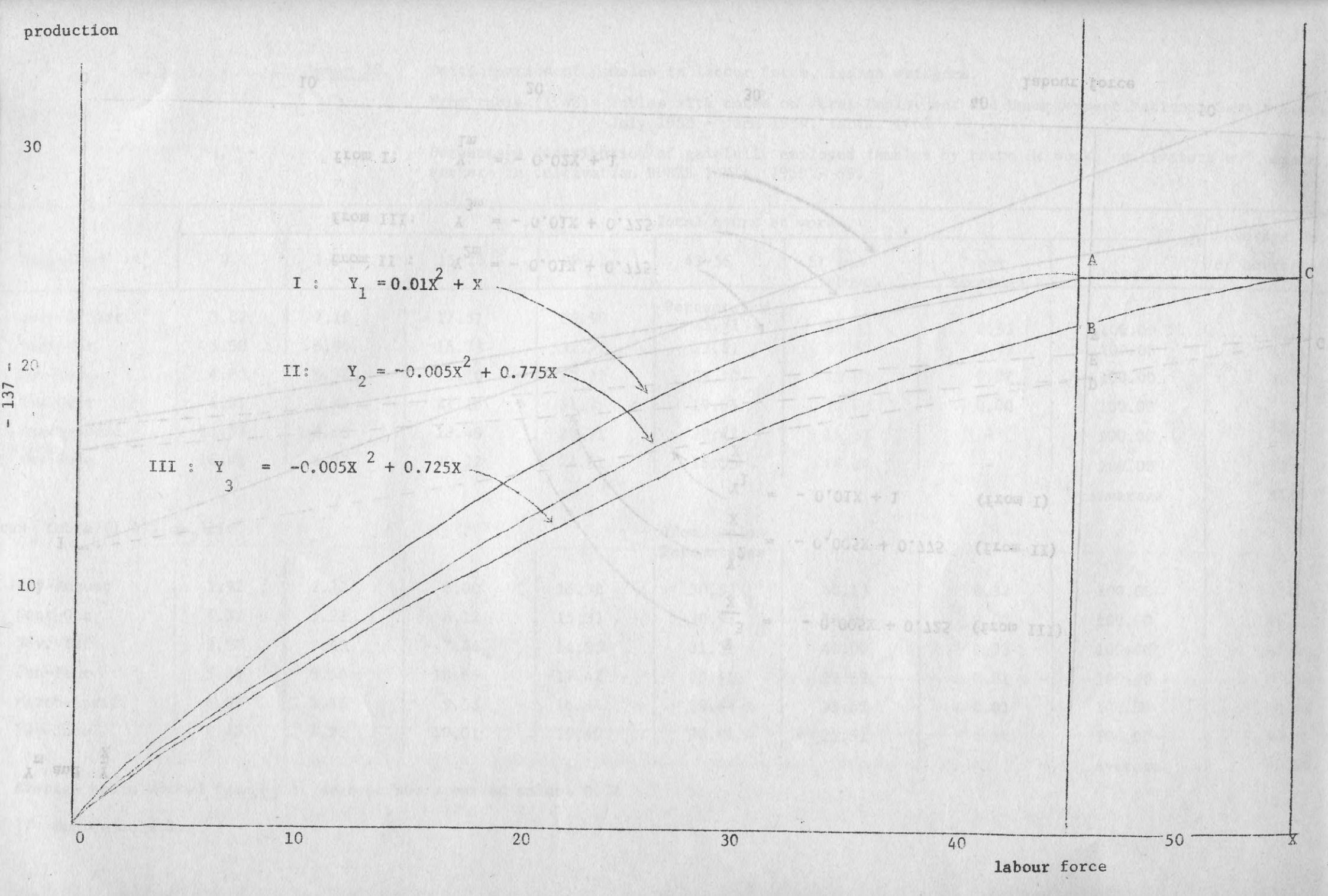
Annex 26. Wage rate (salaries not included) in the Terai

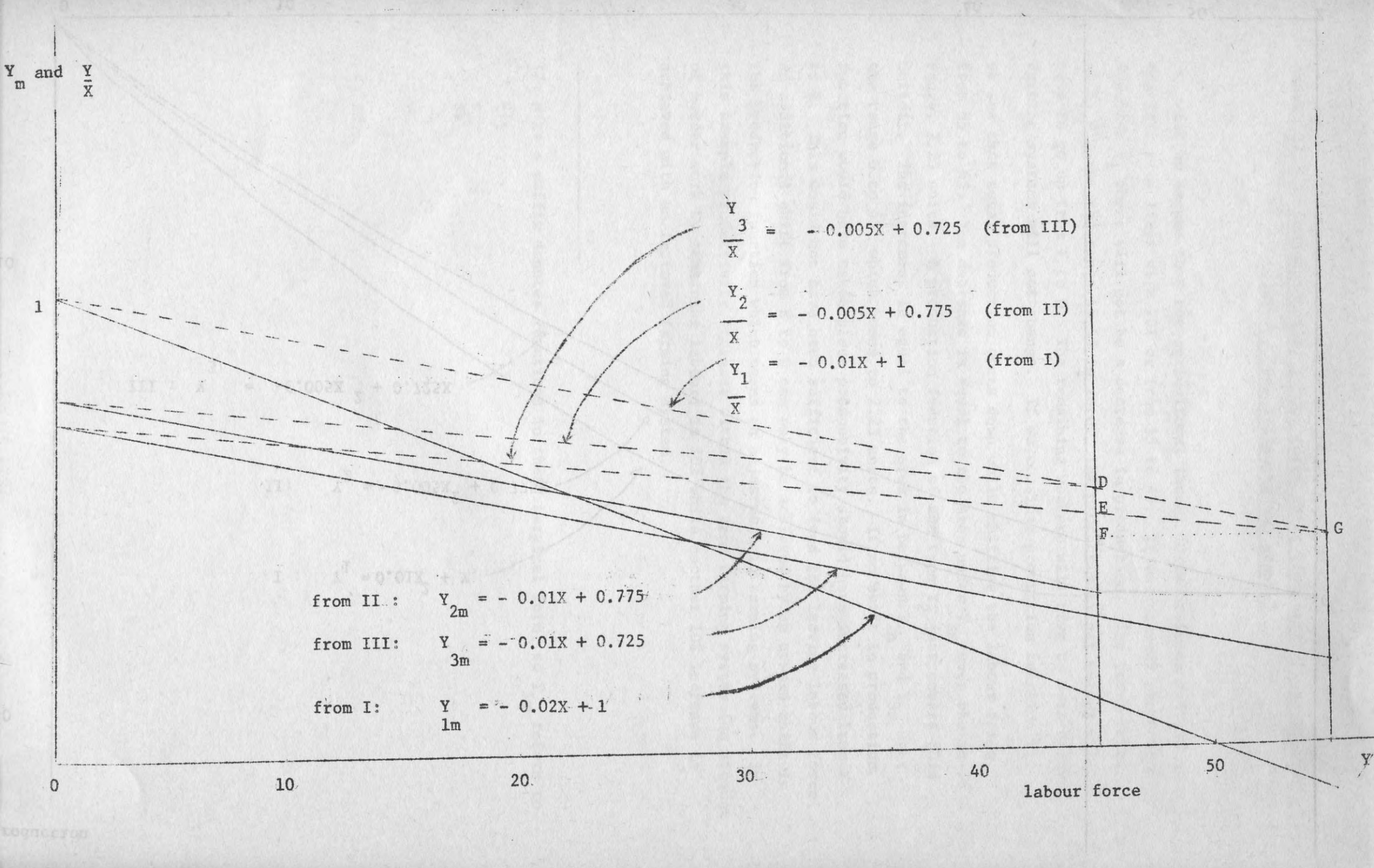
	0	1	2	3	4	all(weighted)
3 receipts	49849	24087	13658	3880	-	704431
days	10005	4310	2430	840	-	137063
Wage rate	4.98	5.59	5.62	4.62	-	5.14
4 receipts	18369	14680	250	150	-	205629
days	4800	4080	60	30	-	54522
wage rate	3.83	3.60	4.17	5.00	-	3.77
5 receipts	22017	26715	4655	10255	1255	585818
days	4896	5849	1226	2712	255	139605
Wage rate	4.50	4.57	3.80	3.78	4.92	4.20
6 receipts	3260	4987	4325	1743	660	104155
days	1250	1676	1353	573	220	34094
wage rate	2.61	2.98	3.20	3.04	3.00	3.05
Terai receipts (weighted)	771899	280501	221928	288396	37308	1600032
days	169705	62469	49264	75346	8500	365284
wage rate	4.55	4.49	4.50	3.83	4.39	4.38

Annex 27 Consequences of labour force shift from agriculture to industry. (see following two graphs)

Let us assume that the agricultural labour force declines without a specific time limit with 20% or from 55 to 45. If we consider production function Y_1 there will not be a decrease in production. The total value of Y_{1m} [1/] over the range 45-55 is zero. The productivity per worker will have to go up from F to D. The remaining workers will have to work harder. Farming systems will not change. If we consider production function Y_3 we see that total production comes down while shifting the labour force from 55 to 45. The decrease is equal to the area under Y_{3m} over the 45-55 range, 2.25 units. A production function of the type Y_2 just covers this deficit. The increment is equal to the area in between Y_{2m} and Y_{3m} over the range 0 to 45, which comes to 2.25 units. If no shift in production function would have taken place productivity should have increased from F to E. This would not have been sufficient to feed the leaving labour force. An additional shift from E to D can only be achieved by an upward shift in the production function which means an adjustment in farming systems. In this example productivity increase within the same farming system (on account of harder work by remaining labour) is 10% while another 10% increase is achieved with an improved farming system.

1/ m as a suffix denotes functions in their marginal form, so Y_{1m} refers to $\frac{dY_1}{dx}$


production
30
20
10
- 137
I : $Y_1 = 0.01X^2 + X$
II: $Y_2 = -0.005X^2 + 0.775X$
III : $Y_3 = -0.005X^2 + 0.725X$
A
B
C
0
10
20
30
40
50
X
labour force


Y_m and $\frac{Y}{X}$
1
$\frac{Y_3}{X} = -0.005X + 0.725$ (from III)
$\frac{Y_2}{X} = -0.005X + 0.775$ (from II)
$\frac{Y_1}{X} = -0.01X + 1$ (from I)
D
E
F
G
from II : $Y_{2m} = -0.01X + 0.775$
from III: $Y_{3m} = -0.01X + 0.725$
from I: $Y_{1m} = -0.02X + 1$
0
10
20
30
40
50
Y
labour force

Annex 28. Participation of females in labour force, Indian evidence.

From table (1.48) Tables with notes on Rural Employment and Unemployment, National Sample Survey, July 1958 - June 1959, INDIA, 1965

Percentage distribution of gainfully employed females by hours at work, cultivators and unpaid family workers in cultivation RURAL INDIA, 1958 - 59.

Sub-round	Total hours at work								Average No. 1/ of hours worked
	0	1-14	15-28	29-42	43-56	57 and above	not recorded	total	
					Percentages				
July-August	3.82	7.18	17.51	25.90	25.81	19.25	0.53	100.00	38.2
Sept-Oct	5.50	6.00	16.28	31.77	23.81	16.55	0.09	100.00	37.1
Nov-Dec	4.80	5.77	15.10	27.98	31.10	15.03	0.22	100.00	38.2
Jan-Febr	6.81	9.95	21.16	31.75	19.85	10.48	0.00	100.00	32.6
March-April	11.37	8.63	18.49	28.71	20.47	12.33	-	100.00	32.3
May-June	16.01	8.97	20.22	24.01	16.55	14.24	-	100.00	30.4
								Average	34.8
From table (1.47) op. cit.					Idem, males				
					Percentages				
July-August	2.92	2.72	8.00	15.38	30.53	40.13	0.32	100.00	47.6
Sept-Oct	4.32	3.22	8.12	15.33	30.93	38.06	0.02	100.00	46.4
Nov.-Dec	3.98	2.49	7.44	14.55	31.21	40.00	0.33	100.00	47.5
Jan-Febr	5.29	3.59	10.66	17.42	33.41	29.62	0.01	100.00	43.6
March-April	6.38	2.83	9.53	16.94	30.64	33.67	0.01	100.00	44.4
May-June	8.42	4.82	10.01	20.40	30.81	25.52	0.02	100.00	40.8
								Average	45.05

Average hours worked females : average hours worked males: 0.77

1/ Own calculation

Annex 28 (continued)

From table (3.10.2) in 16th round of National Sample Survey: July 1960 - June 1961, tables with notes on employment and unemployment in rural areas, INDIA, 1967.

Percentage distribution of gainfully employed females by hours at work, dependent members of the household, RURAL INDIA, 1960 - 1961.

	0	1-7	8-14	15-28	29-42	43-56	57-70	above 70	not recorded	total
dependent member of the household	0.5	1.7	6.3	22.5	28.8	28.1	11.7	0.1	0.4	100

From table (3.10.1) in op.cit. Idem, males

owner operator, not hiring labour during the current week (I)	0.5	0.8	2.3	9.6	19.4	36.2	29.1	1.2	0.8	100
dependent member of the household (II)	0.4	0.4	2.0	8.4	18.9	34.9	33.6	0.9	0.5	100

Average hours of work females - 37.4
males (I) - 46.9
males (II) - 48.3

Ratio average hours females/males I = 0.80
average hours females/males II = 0.77

The Asian Regional Team for Employment Promotion-ARTEP-comprises an inter-disciplinary team of specialists whose common aim is to assist Asian Governments in focusing development policies on employment generation and equitable income distribution. The team is financed from a variety of sources including UNDP, ILO and bilateral donors and is an instrument of the ILO's World Employment Programme.

MEMORANDUM

To: See Distribution

From: John Babylon, Program Economist

Subject: Nepal Rural Household Survey: A Report by ARTEP (Asian Regional Team for Employment Promotion), International Labor Organization.

Subject Survey has been summarized for distribution. A copy of that summary is attached. The report itself has not received wide circulation in Nepal.

The ARTEP Survey was preceeded by an ARTEP Mission report titled, The Challenge for Nepal: Growth with Employment (July 1974) which also has not received wide circulation within Nepal. Finally, a principal ARTEP staff member has written a monograph titled, Agricultural Development and Agrarian Structure in Nepal (Bangkok, July 1974, by K.H. Zevering).

The purpose of this memo is not to summarize the attached summary, but to highlight two rather long quotations from the Survey, from pages 85-87.

"Land and livestock are the major capital items. Capital on livestock, like that on farm buildings, can however be accumulated by labour within the family. Land can only be acquired by purchase or by renting it. As has been explained before, the land price, especially in the hills, has become very high as compared to the productivity of it. The interest forfeited because of the capital thus 'locked up' could quite well match the high level of land rents. As was also shown earlier in this report, interest imputed on capital for Hill farms wipes out all of the labour income there, whereas it brings the Terai labour income down considerably. Altogether, this leaves us with a structural picture that shows us how labour loses out to capital for a large part of the rural population, that is to say, the small mainly owner-operators in Nepali agriculture, especially in the Hills.

Although it seems that there are not yet many Hill families completely landless, the trend which is far advanced in some pockets of the Terai, where there are large groups of landless labourers, is apparent in the Hills as well. It is a slow process of squeezing the small farmer from his vital resource - land. As productivity in all size classes of hill farmers is similarly low there does not seem to be an alternative to large scale exodus in search for land. The government can have an important regulating task in this affair, by ensuring that the land which will become available in the Hills will get into the hands of the most needy remaining families."

"If workers leave agriculture, a surplus is automatically created if marginal productivity is zero, as is often assumed in traditional agriculture. This means that with any agricultural worker departing produce per worker in agriculture increases. If the remaining workers

are not going to eat more then we will find a surplus left which the industrial worker could, as Hanis and Fei vividly depict, carry along on the job. Such a surplus takes the form of a wages fund, and is most apparent in numerous food for work programmes for rural infrastructure.

However, if marginal productivity is not zero, then the surplus will not be sufficient to feed the departing work force. Where agriculture is traditional and mainly geared towards producing for own consumption, the need for survival will make labour force entrants strive hard to increase production. Although resources in a small area may sometimes be exploited to the maximum so that more labour indeed yields no additional produce, this cannot be said of entire countries generally. If we take the example of Nepal, some hill areas may be at their limit of increase in production with existing resource base, but the Terai definitely offers scope for increased production. The production per area unit is much higher in hill agriculture, so that the higher population density can be coped with. This is achieved by the application of a different farming system, with more benefits from the livestock enterprise directly and also indirectly through manure applied to crops. Labour requirements for this more intensive system are relatively high, but so is the output per area unit. It is questionable whether such a delicate farming system can yield similar results with less workers and especially without the more enterprising part of the agricultural labour force that may opt for more remunerative industrial activities and in the past may have been the main pillar of the improved farming system.

The overall conclusion for Nepal agricultural conditions that suggests itself is that a major labour productivity increase on account of improved farming systems and/or an increase in other inputs than labour is urgently needed if sustained development is to be made possible. Applied research in a number of areas, preferably those in the neighbourhood of which industrialisation is going to take place first, should come up with new farm practices, possibly new varieties of crops and other systems of animal husbandry. Only an agricultural sector that is thus prepared for a jump in labour productivity can support the required industrial development."

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Nepal: Rural Household Survey.

Asian Regional Team for Employment Promotion, International Labor Organization. Bangkok, Thailand; June 1976; 140 pages (mimeo).

Survey stated "not as representative of rural Nepal" (p.2) but influences on trends and distribution of income can be generalized with qualifications. Eight villages sampled were within day's walk of a major road and were relatively nucleated.

Survey designed to yield household income data (total, distribution, contributions to, correlation to principal macro indicators, recent migrant versus settled).

Field work was done in January-March, 1974. Enumerators were all graduates in economics or commerce.

Larger the crop production potential the larger household income. However, households with larger crop production potential tend to have more members, so that, for middle strata, per capita trend is mixed.

Measured per capita income was very low: Rs,308 (hills) and Rs.420 (Terai). 86 % of hill households surveyed were in 3 low (less than .62 hectares) strata (of 5), while only 47 % of Terai households had a crop production potential of less than 1.7 hectares.

Low income households in the hills were concentrated in those with lowest crop production potential, while in Terai were fairly evenly distributed.

High income households were concentrated in those with low crop production potential in the hills, but opposite pattern in Terai.

Crop production potential by individual income break followed same pattern as for households with exception of Terai low income, where low income individuals tended to be concentrated in households with high crop production potential (shift of 8 percent).

1 % of hill households were ~~in the highest crop production potential~~ were landless. 23 % of Terai households were landless

7 % of hill households were in the highest crop production potential stratum (more than .62 hectares). 27 % of Terai households were in highest stratum (more than 1.7 hectares crop production potential).

On both household and per capita basis, for both hills and Terai, the highest decile (10 %) of the sample enjoyed a very disproportionate proportion of total measured income (%):

	Household	Per capita
Hills	32.1	27.8
Terai	38.6	29.7

Gini concentration ratios were found as follows:

	Household	per capita
Hills	C.43	0.38
Terai	C.51	C.44

These values are comparatively very high.

Similar results for land area cultivated were obtained: Gini concentration ratios of .47 for hills and .55 for the Terai, with the upper 10 % of hill households cultivating 35 % of the land (45 % in the Terai) and 50 % of the households cultivating 18 % of hill land (14.5 % in Terai).

Income per family worker computations subject to several substantial qualifications. However, four relationships emerge rather clearly. First, imputed-plus -cash net incomes are very low for all but labor on the largest terai farms. (It is easy to calculate zero or nominal wage rates for most of the population's agricultural labor.) Second, there is little real difference between per worker incomes of landless households and per worker incomes of all but the largest hill or Terai households. Third, the average area cultivated per hill farm worker is 8 ares (800 square meters) and 64 ares per Terai worker. Fourth, imputed returns to labor and capital are very low (so low in the hills that a very substantial change in use of the factors of production is suggested).

Systematic attempts to explain variations in household incomes did not yield data of great precision. However, irrigation appeared to be a most significant explanatory variable for both hill and Terai landed households, although caste of household was the most significant variable identified for the Terai. The return to increased intensity of cultivation in the hills was quite low, and in the Terai intensity showed no relation to income.

Sources of income vary widely between villages and between hills and Terai. Income from crop production only accounted for an average of 45.2 % of household incomes in the hills (range 33.4 % -64.8%) with animal husbandry and non-ag. wages and salaries each accounting for roughly 18 %. For Terai sample areas, income from crop production only averaged 57 % (range 38.3 % - 83.7 %) with agricultural wages and salaries accounting for 20 %.

Contribution to the income of each size catagory (according to crop production potential) of household shows substantial differences between the smallest catagory of landed household and the rest. In the hills, households with the least land (less than .21 hectare) derive only 30 % of their income from crop production, with 28 % coming from non-ag. wages and salaries (and 21 % from animal husbandry). All other strata derive more than half their income from crop production and the overall pattern is similar between strata from other sources. In the Terai, only 12 % of the lowest landed household catagory's (less than .35 hectare) income is from crop production, with 63 % from agricultural wages and salaries.

Landless households in the hills derived 46 % of income from non-agricultural wages and salaries, while Terai landless households got 71 % of income from agricultural wages and salaries. Both experienced significant calculated negative income from animal husbandry. Pensions did not accrue to either hill or Terai landless households, but remittances accounted for 21 % of hill landless household's incomes (although zero for the Terai landless).

In the hill sample, households with the least land supplemented their incomes mainly through earnings in both agricultural and non-agricultural employment. In the Terai, the smallest land-holding households supplemented their incomes mainly through agricultural wages and salaries and through miscellaneous activities.

Animal husbandry activities have a negative impact on the incomes of the poorest 30 % of Terai households and the poorest 10 % of hill households (and contribute only 3.4 % of incomes of the poorest 30 % of hill households). The contribution to all Terai households is only 2.1 % but to hill households, animal husbandry contributes 18.4 % of income.

While agricultural wages and salaries account for 48 % of incomes of the poorest hill households and 74 % of incomes of the poorest Terai households, the contribution of crop production to the poorest Terai households was negative while crop production accounted for 35 % of the poorest hill household's income.

The top 10 % of hill households derived 34 % of income from crop production and 30 % from non-agricultural wages and salaries. Pensions and remittances accounted for 15 % of the income of the richest hill households, and only 5 % of comparable Terai households which were dependent on crop production for 74 % of the household income.

While 95.5 % of hill households engage in both crop production and animal husbandry, the Survey population in the Terai identified 28.4 % of households that were either exclusively crop production (5.3 %), exclusively animal husbandry (11.2%) or entirely non-agricultural (11.9 % as opposed to 0.3 % in the hills). The relative importance of crop production or animal husbandry varied widely from district to district in the hills but scarcely at all in the Terai.

The Survey found that absolute values of livestock per household were roughly the same in the hills and Terai, but that the productivity of livestock in the hills was much higher.

Average yields were found to be as follows(kg./are):

	Paddy	Wheat	Maize	Maize/soyabean	Millet
Hills	25.8	7.6	21.0	26.9/6.3	27.7
Terai	10.7	6.1	4.3	- -	4.1

The conclusion that, "hill agriculture to a great extent proves that Terai cropping can be much more productive" (p. 54) is well worth considering.

Average yileds did not vary much between the three small hill household (cropped area) classes, but did show declines to the class of large (relatively) landusers. No pattern of productivity/area of cropland was found in the Terai.

The report proposes that yields on wheat are so low because winter water is relatively scarce, and because labor inputs are haphazard.

On a net returns/hectare basis, the smallest hill farmers produce at a level of efficiency which is 1.6 times that of the largest hill farmer class, and 3.5 times the efficiency of Terai farmers. The hill farmers used 6-7 times more manure and fertilizer than Terai farmers and, on average, employed 7.5 adult equivalent family workers per hectare harvested compared to 0.8 in the Terai sample.

Hired casual labor days per hectare harvested averaged 104 in the hills and 30 in the Terai at an average wage rate of Rs.3.64/day in the hills and Rs.4.67/day in the Terai.

Costs of production per hectare decline with each increase in size stratum for hill households (from Rs.1571 to Rs.934). However, the only systematic decline is in direct costs, particularly for manure and fertiliser, reflecting the decreasing intensity of cultivation rather than economies of scale. A sharp drop in variable costs from the smallest to the next stratum is recorded for hill farms, but no clear pattern emerges for the other three (larger) size classes. The report concludes that economies of scale are apparent only in regards to the smallest of hill farm households, and not at all for Terai farm households.

Actual cropping intensity (harvested area divided by cultivated area) exceeded "potential cropping intensity" (cultivated area plus irrigable area divided by cultivated area) for every stratum surveyed. From the data it can be inferred that the smaller hill units practice double cropping without irrigation satisfactorily.

An analysis of factors influencing the level of net crop income for agricultural households in the sample uncovered two striking charcteristics of the farm systems surveyed. First, an additional Terai hectare would yield the average household Rs.949 while the calculated average household income in the Terai was Rs.771. The implication of increasing returns to scale is not corroborated by the cost per hectare data, which shows a pattern approximating constant returns to scale (a pattern consistent with a matured production system). Second, a linear regression analysis on crop income developed a relationship of negative impact of cost components on net income. In the Terai an increase in direct costs brought down net income while in the hills an increase in non-direct (operating) costs had the same effect. This

pattern needs much more investigation before its' implications are clear. The Survey is worth quoting on this point:

> "The results here point at a high level of inefficiency in crop production which may be caused by invalidity of input recommendations or at least their faultiness. If Terai crop farmers tend to loose NRs.1.17 per each additionally spent NRs. on inputs and additional labor (human and animal) and equipment utilization in the hills leads to losses in net crop income rather than to gains there is something basically wrong with management of these farms." (pps. 61-62)

The Survey found a consistent pattern of increasing numbers of livestock per size of household, and increasing gross income from animal husbandry per livestock available per size stratum, in both the hills and Terai. In the hills, animal husbandry yielded an average income per livestock unit of Rs.118 as compared to Rs.94 in the Terai. Income from animal husbandry was much lower for landless and very small agricultural households than larger households in both areas, and costs were much higher overwhelmingly for straw and maize stalks ("fodder"). In both areas the production of buffalo milk contributed most (about one-third of total income from animal husbandry). Second in the hills was ghee (26 %) while draught power was second in the Terai (25.4 %). There was a clear tendency for the productivity of buffalos to increase with the size of the household. The potential of the buffalo was not approched in cattle: "The productivity in milk of cows is so low that we could almost conclude that changes of bringing their productivity within a reasonable range could be written off." (p.65).

Computation of income imputed from agricultural activities by adult equivalent family workers was made on an annual basis. This series of data showed negative imputed incomes for landless laborers, due to the overwhelming effect of animal husbandry, in both the hills and Terai. In every case, imputed income per agricultural family worker increased per size stratum of household. The average for the hills was computed at Rs.453, and for the Terai Rs.1008. Wages actually paid by the household for (supplementary) labor services averaged Rs.1095 per year for hill households and Rs. 1304 for Terai agricultural households. Wages paid were computed on a per adult basis and compared to imputed family per adult labor return: The Survey reports that the annual rate of wages paid were much higher (on a per adult basis) for all stratum in both hills and Terai except for the largest Terai households (1.7 hectare crop production potential and above). When an attempt is made to adjust for un-and under-employment among wage owners (calculated at 37 % for Terai agricultural labor in the sample), the difference disappears for the Terai but remains in the hills (Rs.453 vs.Rs.678 rather than Rs.1095). This means, of course, that it is very profitable for hill farmers, especially those on smaller holdings, to replace paid labor with family labor.

Overall, income or productivity per worker in agriculture was found to be as follows (Ibid., p. 70):

Size stratum	0	1	2	3	4	all
Hills	-451	417	465	541	690	483
Terai	-218	204	399	690	1616	1055

When combined with harvested area per adult equivalent worker, the greater productivity of hill farmers on small holdings is highlighted (ares, p. 70):

Size stratum	1	2	3	4	all
Hills	8.3	11.4	16.1	27.2	12.7
Terai	23.5	44.6	70.0	160.3	106.9

When the distribution of net agricultural income per household is analyzed (as opposed to total incomes noted earlier), over-all concentration ratios are increased (the inequality of distribution is increased) because the compensating effect of wages and salaries disappears. In the hills, the sample survey found that the bottom 30 % of households received 7.5 % of net agricultural incomes (4.2 % in Terai). The top 10 % of hill households received 31 % of net agricultural incomes (43 % in Terai).

Incomes from wages and salaries show wide variations between sample sites. Receipts in kind (especially partial payment of wages in food) also complicates an analysis. General Survey findings were that: 16 % of adult equivalent workers were occupied in wage and salary earning in the hills (25 % in the Terai) with a gradual decrease in proportion of household labor force as the crop production potential of the household increased. Receipts from wages and salaries amounted to 42 % of total household income in the hills (paymentof wages in food included) and 33 % in the Terai. The general pattern is for returns from wages and salaries to exceed the returns from household work, per adult equivalent worker. In the hill samples, 54 % of households earned some wages or salaries (70 % in the Terai), there were 1.5 workers for wages or salaries per hill household (1.32 in Terai) and days employed per worker for wages or salary were 163 per year for both hill and Terai survey locations.

Days worked per worker for wages were found to be 174 days/year for porterage (hills), 127 days/year for unspecified jobs (Terai), 270 days/year for agricultural wages (hills and 250 days/year for agricultural wages (Terai).

Days worked per salaried worker per year amounted to near full employment for such workers: 295 in the hills and 293 in the Terai. Service jobs (mostly government employment) accounted for nearly 50 % of non-agricultural employment in both hills and Terai.

Generally, the number of workers per household is similar for landless and small/medium size agricultural households, but increases sharply for the largest hill household and decreases sharply for the largest Terai household.

Wage levels (excluding salaries) averaged Rs.3.95/day in the hills (including food payments) and Rs.4.38/day in the Terai. Cash payments for agricultural work were found to average Rs.2.56/day in

the hills (Rs.5.19/day in the Terai). The portérage wage was estimated at Rs/2.58/day. Miscellaneous jobs in the Terai paid the highest, Rs.6.01/day. (Recall that the survey was conducted in early 1974.)

In kind payments are relatively more common in the Terai. 57 % of all wage and salary payments were reported to be made in kind in the Terai, compared to 34 % in the hills (including food payments to daily workers, excluding labor exchange work).

Data on non-agricultural household enterprises was not collected on a wide enough basis to justify a separate analysis. A wider sample coverage, or an area census, would be required. The Survey includes any such enterprises which were sampled in the "miscellaneous" category.

Income from miscellaneous sources is relatively most important for hill landless households, accounting for 23 % of total income. Most of this activity is milling of paddy, milling for oil and construction. For other hill and Terai households, miscellaneous sources accounted for 7-16 % of total income, except for the largest Terai households, where only 2.3 % of household income in the largest crop production households came from miscellaneous sources.

In the hills, 4 % of total income came from pensions, and 2.6 % from remittances. In the Terai, 2.5 % of income was from pensions and 1.9 % from remittances.

Using the concept of "adult equivalent workers "(which assigns different weights to time reported worked according to sex and age of worker) the Survey calculates labor participation rates of 0.51 in the hills and 0.35 in the Terai, noting that the lower Terai rate could be due to under-reporting of work by females (especially in the larger households) that would be done by men in the hills (collection of fuel and grain milling).

This is illustrated in the following table showing percentage contribution to the total surveyed labor force:

	Children	Adults	
		Male	Female
Hills	5.9	49.3	44.8
Terai	3.4	77.6	19.1

A clear pattern of the number of adult equivalent workers per household increasing with the increasing crop production potential of the household was found in both the hills and the Terai, going from 1.33 to 4.38 in the hills and from 1.66 to 2.35 in the Terai.

The Survey report calculates the net income (net value added) to labor and own capital per adult equivalent family worker per household strata and divided into agricultural households only, wage labor households only and all households. The results show that wage-labor-only household workers are more productive than workers on small farms

(first three of four size strata). Second, productivity per worker increases with the size of the household's crop production potential. Third, workers on small hill farms are more productive than farmers on small Terai holdings. Fourth, by far the most productive worker is one on a large (greater than 1.7 hectare) Terai farm. Fifth, wage-labor-only Terai household workers are more productive than their hill counterparts. Sixth, over-all the Terai worker in the sample was nearly twice as productive as the average hill worker.

Following a series of assumptions, the Survey report arrives at an unemployment-underemployment rate of 37 % for Terai wage-only workers. An over-all unemployment-underemployment rate for workers in agriculture of 16 % can be derived.

The Survey report concludes the discussion on productivity with the assessment that, "under existing technology there remains a big portion of underemployment or under-productivity which can only be alleviated by a change in technology or a wider capital/output ratio" (p.93). Farms below 0.42 hectare in the hills and 1.7 hectare in the Terai appear to be so small that they operate below average labor productivity (the capital/labor ratio is too low).

One (of eight) surveyed villages contained a large sub-group (42 %) of recently migrated households. Data was analyzed separately on these households and a couple of other recently-migrated households identified in other sampled villages. It was found that the migrant households were small farm households that contained slightly more than the average number of persons and (possibly because of having more members) which enjoyed somewhat higher incomes than average. The principal sources of income were wages and salaries and animal husbandry. The migrant households thus appeared to have successfully compensated for having less land (only 14 % of recently-migrated households were landless, compared to 26.5 % of established households in the one village with many recent migrants).

After pointing out some topics for further research, the Survey report concludes:

> "The absolute low level of living as compared to modern societies points to the need for drastic measures introduced from outside the system if indeed modernization along the lines of most of the nations in this twentieth century world is an objective of the Nepali society." (p. 103)

Encl: JRBabylon/ss:1/16/78