JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

DEPARTMENT OF IRRIGATION
MINISTRY OF WATER RESOURCES
HIS MAJESTY'S GOVERNMENT OF NEPAL

THE STUDY ON THE REHABILITATION OF GOVERNMENT DEVELOPED IRRIGATION SCHEMES IN THE KATHMANDU VALLEY

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FEBRUARY, 1995

NIPPON KOEI CO., LTD.
CHUO KAIHATSU CORPORATION

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STANDARD ABBREVIATIONS

ADB	Asian Development Bank
ADB/N	Agricultural Development Bank, Nepal
ADO	Agricultural Development Office
AIC	Agricultural Input Corporation
AO	Association Organizer
CDR	Central Development Region
CRID	Central Regional Irrigation Directorate
CSSC	Cooperative Saving and Service Centre
DADO	District Agricultural Development Office
DAO	District Administration Office
DCO	District Cooperative Office
DIO	District Irrigation Office
DoAD	Department of Agricultural Development
DoCD	Department of Cooperative Development
DoHM	Department of Hydrology and Meteorology
DoI	Department of Irrigation
EIRR	Economic Internal Rate of Return
EOJ	Embassy of Japan
FAO	Food and Agriculture Organization of the United Nations
FMIS	Farmer Managed Irrigation Scheme
GDP	Gross Domestic Product
GOJ	Government of Japan
HMGN	His Majesty's Government of Nepal
ISP	Irrigation Sector Program (ADB)
JICA	Japan International Cooperation Agency
JT	Junior Technicians
JTA	Junior Technical Assistants
KVUDPP	Kathmandu Valley Urban Development Plan and Programs
KWM	Kalimati Fruits and Vegetable Wholesale Market
LRMP	Land Resources Mapping Project
MIT	Mobile Irrigation Team
MoA	Ministry of Agriculture
MoWR	Ministry of Water Resources
NARC	Nepal Agricultural Research Council
NPC	National Planning Commission
NWSC	Nepal Water Supply Corporation
O&M	Operation and Maintenance
RID	Regional Irrigation Director
SFDP	Small Farmer Development Program
S/W	Scope of Works for the Study
UNDP	United Nations Development Program
VDC	Village Development Committee
VGG	Vegetable Grower's Group
WUA	Water Users' Association

Local Name

BTP	Bhaktapur
KTM	Kathmandu
LTP	Lalitpur
Kh.	Khola = River or Stream

ABBREVIATIONS OF MEASUREMENTS

Length

mm	= millimetre
cm	= centimetre
m	= metre
km	= kilometre

Time

s	= sec	= second
min		= minute
h	= hr	= hour
d		= day
y	= yr	= year

Area

cm^2	= sq.cm	= square centimetre
m^2	= sq.m	= square metre
ha	= hectare	= 10,000 m^2
km^2	= sq.km	= square kilometre
Ropani		= 509 sq.m
Bigha		= 0.66 ha

Electrical Measures

W	= watt
kW	= kilowatt
MW	= megawatt
kWh	= kilowatt hour
V	= volt

Volume

cm^3	= cc	= cubic centimetre
l	= lit	= litre
m^3	= cu.m	= cubic metre
MCM	= 10^6 m^3	= million cubic metre

Other Measures

%	= percent
°	= degree
'	= minute
"	= second
°C	= degrees Celsius

Weight

mg	= milligram
g	= gram
kg	= kilogram
ton	= metric ton

Derived Measures

m^3/sec	= cubic metre per second
lit/sec	= litre per second
lit/s/ha	= litre per second per hectare
MLD	= million litre per day

Currency and Others

NRs.	= Nepalese currency Rupee
US$	= US Dollar
J.Yen	= Japanese Yen

Exchange Rate as of July, 1993

US$ 1.00 = NRs.49.0 = J.Yen 108.89
NRs.100 = US$ 2.04 = J.Yen 222.22
J.Yen 100 = NRs.45.0 = US$ 0.9184

Exchange Rate for the Feasibility Study as of July, 1994

US$ 1.00 = NRs.49.0 = J.Yen 100.
NRs.100 = US$ 2.04 = J.Yen 204.

El. = elevation above mean sealevel

ANNEX - 1

PRESENT AGRICULTURAL AND AGRO-ECONOMIC CONDITIONS

ANNEX - 1

PRESENT AGRICULTURAL AND AGRO-ECONOMIC CONDITIONS

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1. MASTER PLAN STUDY

1.1 Agriculture

1.1.1 Landholding and Land Tenure

The cultivated area in the Kathmandu Valley amounts to about 30,000 ha with a total number of 97,000 farm households. In the Study Area, there are about 10,000 ha of cultivated land with a total number of 36,000 farm households. The average size of landholding in the Study Area is 0.28 ha. The distribution of farm households according to the landholding size is shown below:

Landholding size	Distribution (%)
without land	0.78
under 0.2 ha	41.21
0.2 - 0.5 ha	39.09
0.5 - 1.0 ha	15.76
1.0 - 5.0 ha	3.14
over 5.0 ha	0.02

The land tenure condition in the Kathmandu Valley is characterized as follows and is referred to in Table 1-1:

a) There were about 54,000 owner cultivators in the Kathmandu Valley, which accounted for 56% of the total number of farm households in 1991/92.

b) The number of owners cum tenants increased from 18% in 1981/82 to 37% in 1991/92.

c) Owner cultivators and owners cum tenant cultivators accounted for 93% of the total number of farm households in 1991/92. Tenant farmers accounted for 7% in the same year.

d) The cultivated area operated by owner cultivators is about 23,000 ha, 75% of the total cultivated area. The area under tenancy is 25% of the total cultivated area.

The tenant charge is generally fixed according to the quantity of produce.

1.1.2 Cropping Pattern and Farming Practices

(1) Crops and the Cropping Pattern

The cropping season in the Study Area is divided into two seasons, the rainy season and the winter season. The present cropping pattern in the Study Area is shown in Figure 1-1.

In the lowland area, the main crop grown in the rainy season is paddy, followed by winter crops, mainly wheat. Potatoes and vegetables are also cultivated, but in a small area. In the rainfed upland area, maize is the main crop in the rainy season, followed by winter crops. The major crop rotation patterns in the Study Area are shown below:

Lowland		Upland	
- Paddy - Wheat	(49.5%)	- Maize - fallow	(21.0%)
- Paddy - Potatoes	(4.0%)	- Maize - other cereals	(8.0%)
- Paddy - Vegetables	(3.0%)	- Maize - Wheat	(3.0%)
- Paddy - Maize	(2.0%)	- Maize - Mustard	(2.0%)
		- Maize - Legumes	(1.5%)
		- Others	(6.0%)

Paddy occupies 5,900 ha or 59% of the 10,100 ha of cultivated land in the Study Area, and most of this area is cultivated with wheat in winter. The planted area and crop intensity in the Study Area are summarized below:

Crop	Planted area (ha)	%
Paddy	5,900	58.5%
Wheat	5,300	52.5%
Maize	3,800	37.5%
Other Cereals (millet etc.)	850	8.0%
Legumes	350	3.5%
Potatoes	650	6.5%
Mustard	200	2.0%
Vegetables	450	4.5%
Total	17,500	173.0%

(2) Crop Yield and Production

The planted area, yield, and production of crops in the Study Area are presented in Table 1-2. Generally, major crop yields are higher in this area than crop yields for the whole of Nepal. According to the results of the sample farm survey, the average yield of paddy in the areas covered by existing irrigation systems was about 10% higher than areas under rainfed conditions. In the case of potatoes, the average yield under rainfed conditions was estimated at only 25% of that in irrigated areas.

In 1991/92, the total amount of paddy produced in the Study Area was 28,000 tons. The average unit yield of paddy in the Study Area was estimated at 4.7 tons/ha, which was much higher than the national average of 2.3 tons/ha.

As shown in Table 1-2, the total amount of secondary crops produced such as wheat, maize, and potatoes in the Study Area is 9,000, 7,900, and 7,200 tons, respectively. The average unit yields of these crops are 1.7, 2.1, and 11.1 tons/ha, respectively.

Legumes cultivated in the Study Area are mainly soybeans and blackgrams in the rainy season and peas in the winter season. The total amount of legumes produced is estimated at 200 tons and the average unit yield is 0.6 ton/ha.

The major vegetables grown in the Study Area are cauliflower, radish, cabbage, and broadleaf mustard in the winter season and french beans, brinjal, and tomatoes in the rainy season. The total amount of vegetables produced is estimated at 4,450 tons in the Study Area and the average yield is 9.9 tons/ha.

(3) Farming Practices

Most of the farmers are using improved varieties of seed. As a result of the sample farm survey, it was discovered that the crops previously produced by farmers themselves were the main source of seed. Farmers usually prepare the seed themselves and sometimes, once every two to three years, purchase new certified seed from the agencies shown in Figure 1-11. The number of farmers using home stored seed is high (60%), compared to those who are using purchased seed (40%).

Most of the farmers use chemical fertilizers in the Valley. These chemical fertilizers are monopolistically distributed by AIC. The average amount of chemical fertilizer used in the Valley far exceeds that used in other areas of the country. The amount of chemical fertilizer supplied to the Valley was 11% of the total supplied to Nepal and the average amount supplied to the Valley per hectare was much higher than that supplied per hectare to the whole of Nepal, as shown in Table 1-13 and summarized below:

(1991/92)

Description		Nepal	Kathmandu Valley
Total Amount Supplied by AIC	(ton)	185,800	20,700 (11.1%)
Average Amount Supplied	(kg/ha)	70	700
Average Amount of Nutrient Content N : P : K	(kg/ha)	22 : 8 : 0.5	210 : 42 : 0.7

Farmers use mostly urea and complex. In addition to urea and complex, large amounts of compost manure are used by farmers.

According to the farm survey, the use of agro-chemicals such as pesticides, herbicides, and fungicides is not common in the Study Area.

Farmers in Nepal generally use bullocks for land preparation. However, such draught animals are not used for agricultural activities in the Study Area. Human labourers are the main labour force for farming activities in the Study Area. According to the National Sample Census of Agriculture (1991/92), the number of existing farm machines such as tractors and power tillers was 836 and 1,397, respectively in the Study Area. The average number of these machines per hectare is 0.09 and 0.15, respectively. However, many tractors and power tillers are actually not used for cultivation, but for transportation purposes only. Agricultural implements and other facilities in the Study Area are presented in Table 1-3.

Regarding the processing practice, most farmers in the Study Area use threshers. In the case of paddy, farmers use the pedal thresher. The post-harvest activities are presented in Table 1-4.

The general farming practices for the major crops are briefly described below:

Paddy

The most popular varieties of improved paddy in the Study Area are *Taichung-176*, followed by *Masuli*. The local varieties of paddy, *Masino* and *Pokhareli*, are also cultivated by several farmers in some areas. The sowing of seeds is generally carried out in nursery beds in April/May and transplanting in the main field in June/July. Preparation of the mainfield is carried out by digging and ploughing. Organic manure is applied during land preparation and nitrogenous chemical fertilizer in split doses, half at the time of land preparation and the remaining half as top dressing. Weeds are controlled manually. Plant protection is not practiced unless there is severe damage. Harvesting is conducted with sickles in October/November. Threshing is conducted using pedal threshers and winnowing using the traditional method.

Maize

Maize is mostly grown in rainfed fields. Improved varieties of maize such as *Khumal Yellow* , and *Rampur Yellow* are widely grown in the Study Area. As a result of the farm survey, it is evident that the area covered with these varieties is about 75% of the total planted area. Manure is broadcasted to the field prior to land preparation. Seeds are either broadcasted or line sown in April/May. Weeding is carried out manually. Using nitrogenous fertilizers, top dressing is a common practice. Harvesting starts in August. Green maize leaves are lopped and used for animal fodder.

Wheat

The improved varieties of wheat, *Lerma Rojo 64*, *Lerma 52*, *NL 297*, and *RR 21* are widely grown. However, in some areas, particularly in upland areas, local varieties of

wheat are also grown by some farmers. Land preparation is carried out manually in October/November. Seeds are generally broadcasted. During the growing period, weeding is conducted once or twice in the area. Chemical fertilizers are widely used and manure is also used. The crop is harvested with sickles in April/May and threshed using threshers after drying. The grains are winnowed using the traditional method.

Potatoes

Potatoes are generally planted during January and February and harvested in May. The amount of seed used is about 1,000 kg/ha. After land preparation, potatoes are planted. Organic manure, complex, and urea are the main fertilizers used. The amount of fertilizers applied is very high compared with the other main crops, as shown below:

Crop	Seed	Fertilizer (kg/ha)			Compost	Human labour (m/d)		
	(kg/ha)	Complex	Urea	Total	(kg/ha)	Family	Hired	Total
Paddy	53	101	273	374	6,649	172	74	246
Wheat	114	63	249	312	6,506	98	24	122
Maize	23	55	207	262	4,997	133	33	166
Potatoes	1,015	196	437	672	10,688	300	50	350

Weeding is carried out two or three times during the growing period. Harvesting is conducted in April.

Mustard

In the Study Area, the adoption of improved varieties of mustard has been limited. Mostly local varieties of mustard, namely, *Kalotori* and *Baltori* are grown. This crop is generally grown under residual moisture conditions and makes use of the fertility of preceding crop and is cultivated using either the mono-culture method or relay cropped with paddy. Farmers prefer to use a little fertilizer for this crop. Weeding and thinning are carried out at the same time. Harvesting is conducted by pulling out the matured plants. The plants are threshed with wooden sticks. The grains are then winnowed using the traditional method.

Legumes

Soybeans and blackgrams are major grain legumes grown in the Study Area as rainy season crops. These crops are ridge cultivated with paddy and are inter-cropped with maize. They are grown using minimum tillage operations. The matured plants are mostly pulled by hand and threshed with sticks manually.

Vegetables

Farming practices for vegetables vary widely depending upon land location and availability of irrigation water. The major vegetables grown in the Study Area are cauliflower, radish, cabbage, and broadleaf mustard in the winter season and brinjal and tomatoes in the rainy season. Leguminous vegetable crops, such as garden peas in winter and french beans in the rainy season, are also important vegetables in the Study Area. The general farming practices related to each vegetable are shown in Table 1-5. In the case of cole vegetables and fruit vegetables, such as cauliflowers, cabbages, brinjals, and tomatoes, seedlings are firstly grown in the nursery and later transplanted in the main field. Farmers grow both local and improved varieties. Most of the improved varieties are obtained from private dealers. Organic manure is supplied during land preparation, and top dressing using complex, urea, or potash, is also practiced.

Farmers use very little plant protection chemicals. The vegetables are harvested over a long period of time, by hand or sickles because they perish very quickly.

1.1.3 Livestock and Inland Fishery

The livestock population in the Study Area is estimated and presented in Table 1-6. Compared to other districts of the country, the role of livestock in the farming system in the Study Area seems to be low. The practice of not using draught power (particularly bullocks) in agriculture in the Valley is one of the main reasons for the above. 41% of the total number of farm households raise cattle, mainly for milk production. The percentage of farm households which goats and poultry is 34%. These are kept for the purpose of earning cash income. Some of the poultry farmers also raise a large number of poultry. Goat and chicken meat fetches good prices in the market, therefore, most of the farmers raise goats and chickens. The production of livestock products in the Kathmandu Valley is presented in Table 1-7.

There are four research centres and nine production farms for inland fishery. Of these, two research centres are located in the Kathmandu Valley (Godawari and Balaju) and research work regarding inland water fish such as trout, is carried out in the hilly area. However, in the Valley the role of inland fishery also seems to be low. The Fishery Office recommended the "Paddy Cum Fish Culture", but the total area of the ponds operating under this type of fish culture is only seven ha in the Valley most of which is for home consumption purposes. The pond area, water surface area, and the amount of fish produced in the Study Area are presented in Table 1-8.

1.1.4 Farmers' Economy

Based on the data and information obtained from the Agricultural Marketing Division, DADO in each district, and the Farm Survey, the annual farm budget of average sized farm households in the Study Area was worked out and is shown in Table 1-9.

The average holding size of farmers in the Study Area is 0.28 ha, and 81% of farmers possess under 0.5 ha. Farmers who own land and self-cultivate it are estimated at about 92% of the total number of farmers in the Study Area. Owing to rapid urbanization in the Kathmandu Valley, job opportunities are also rapidly increasing. The majority of farmers in the Kathmandu Valley have large amounts of non-farm income estimated at about 75% of the total amount of household income. Even farmers who cultivate more than 1.5 ha, are estimated to obtain half of their total household income from non-farm activities. The sources of non-farm income are services or salaries from government and nongovernment jobs, business income from shops, wages from construction works, cottage industries where mainly domestic made goods are produced including bamboo baskets, ropes and mats etc. , and pensions which are given to retired government employees.

Farmers with average sized farms mostly balance their income and expenses. However, farmers with large-scale farms usually keep reserves at hand.

1.1.5 Agricultural Support Services

(1) Government Organization

a) Department of Irrigation (DoI)

DoI under MoWR participated in many irrigation development projects of various scales and different characteristics, while seven Irrigation Development Boards under MoWR are involved in large-scale irrigation projects.

There are five divisions under the Director General of DoI: (i) Planning, Design, and Monitoring & Evaluation Division; (ii) Surface Irrigation Division, (iii) Ground water Irrigation Division, (iv) Irrigation Management Division, and (v) River Training, Environment, and Mechanical Division. The Administration Division, Account Division, and Legal Section are also directly under the Director General. Under each division, different sections exist. The organization chart of DoI is shown in Figure 1-2.

At present the total number of officials in DoI is 192, of these, two are agro-economists in the Monitoring and Evaluation Section and four are agronomists in the Design, Quality Standardization and Feasibility Study Section, System Management Section, Research & Technology Development Section, and Manpower Development & Training Section.

In addition to the above-mentioned officials, there are project implementation groups with a total number of 293 staff members.

There is a DIO in each district under the Regional Directorate. In the Study Area, there are three DIOs: Kathmandu, Lalitpur, and Bhaktapur. The organization chart of each DIO is shown in Figure 1-3.

b) Ministry of Agriculture (MoA)

There are three Development Boards and one commission directly under the Minister: i.e., the National Cooperation Development Board, National Dairy Development Board, Tea & Coffee Development Board, and Agricultural Price Commission. The research sectors such as the National Agricultural Research Centre and Agricultural Research Programs are also directly controlled by the Minister.

There are two departments and four divisions directly under the Secretary: DoAD, DoCD, Women Farmer Development Division, Monitoring & Evaluation Division, Planning Division, and Agriculture Statistics Division. The Administration and Financial Division is also directly under the Secretary.

In addition to the above units, MoA has eight corporations under the Secretary: AIC, Dairy Development Corporation, Agricultural Tools Corporation, APROSC, Agriculture Lime Industry, Jute Development and Trading Corporation, National Seed Board, and Cotton Development Board.

Under DoAD, there are seven units headed by the Deputy Director Generals; (i) Planning, Monitoring & Evaluation; (ii) Crops; (iii) Livestock; (iv) Horticulture Development; (v) Plant Protection; (vi) Food Nutrition & Technology; and (vii) Fisheries. There exists five Regional Directorates under DoAD. The organization charts of MoA and DoAD are shown in Figures 1-4 and 1-5.

There is a DADO in each district under the Regional Directorate. In the Study Area, there are three DADOs: Kathmandu, Lalitpur, and Bhaktapur. The organization chart of each DADO is shown in Figure 1-6.

(2) Research Services

Agricultural research work in Nepal is carried out under the umbrella of NARC. There are various commodity programs, research farms/stations, and disciplinary divisions for carrying out research on specific crops, livestock, horticulture, and fishery in the country.

NARC is now an autonomous body mandated with all the powers and responsibilities for the development of plans, programs, and policies concerning any matters and issues regarding agricultural research work in the country. The objectives of NARC are as follows:

- To formulate, coordinate, implement, monitor, and evaluate all the research plans and programs in the country;
- To improve research facilities, fiscal and personnel management, and the overall research efficiency in the search for appropriate technology;
- To strengthen the research outreach program of the farms and stations by collaborating with extension programs and focusing the needs of the small farmers on the farming system approach,
- To strengthen connections with international agricultural research centres and relevant national research centres and institutes, and
- To publish research results and information concerning new technology, in appropriate forms, for the use of extension personnel, farmers, and administrators.

There are four Regional Research Stations and 16 Agricultural Research Stations in Nepal. The names and locations of the Agricultural Research Centers are shown in Table 1-10. At present, 10 commodity research programs, which carry out research on major crops and four on livestock and fisheries are in operation at a national level. The organization chart of NARC and the names of the commodity programs are shown in Figure 1-7.

(3) Extension Services

Agricultural extension services in Nepal are carried out under the responsibility of the Director General of DoAD of MoA. The Regional Agricultural Director of the Regional Directorate of Agriculture Development, under the supervision of the Director General, is responsible for the coordination and supervision of agricultural development programs in the region, including extension services. Under the supervision of the Regional Agricultural Director, the District Agricultural Development Officer is responsible for all activities concerning the agricultural development programs in the district.

Agricultural extension services in each district are carried out by field level extension workers stationed at each Agricultural Service Centre: 6, 6, and 7 in Lalitpur, Bhaktapur, and Kathmandu districts, respectively. Each Agricultural Service Centre covers 6.8 villages and 1,600 ha of cultivated land in the three districts and are staffed with 7.5 extension workers, consisting of 2.5 Junior Technicians (JT) and 5 Junior Technical Assistants (JTA) on an average, as shown in Table 1-11. The average number of villages and farm families and the average cultivated area covered by a centre per extension worker is 0.9 villages, 680 farmers and 209 ha, respectively. Regarding the number of extension workers, it is observed that there is no shortage in this area.

General extension activities are carried out using a group approach, by organizing farmers' groups which consist of around 15 farmers in each ward level. Parallel to the group approach, is the farm visit program which is generally used for answering individual farmers' questions. In addition to these, an ordinary approach, demonstration program, nursery establishment, farmers' day, crop competition, and training program are generally used by combining two or three extension methods.

The demonstration program is divided into several sections according to the main purposes of the demonstration. To show the results of the total technology package applied, the orientation demonstration is used, while to show the results of one or two items of technology applied such as recommended new varieties of seed, or a recommended chemical fertilizer application, the result demonstration is used. For nutrition improvement, the kitchen gardening demonstration has become popular in these districts.

Under the horticultural development program, the establishment of nurseries is carried out by providing training to interested farmers, regarding the recommended vegetable seed in order to promote privatization of seeds or seedling production at a village level.

A farmers' day is held once or twice a year by DADO in order to provide one day trips for participating farmers so that they can observe some progressive farmers' activities in the district.

A crop competition is held once a year at a district level and the winner is presented with an award on 13th October, at the World Food Day.

Training programs for farmers are provided at three levels, at field, district, and regional levels, according to the development program. At a field level, each Agriculture Service Centre provides training courses for leading farmers regarding the seasonal topics of crop production or animal husbandry. Each DADO provides training courses for leading representative farmers recommended by each Service Centre. The leading promising farmers selected through training courses are sent to the Regional Training Centre in order to acquire more professional techniques and know-how.

In 1991/92 the number of training courses and the number of farmers who attended them, at a field level, was 79 courses and 1,700 farmers in total for the three districts, as shown in Table 1-12.

One of the unique extension activities is the 4-H Club promotion. To qualify for the 4-H Club people must be: (i) farmers' children; (ii) 13-25 year old boys and girls; (iii) who dropped out of upper school; and (iv) who are literate or illiterate, if any.

4-H Club members are classified into the following three categories:

a) Primary knowledge level (13-15 year olds)
   Objective : to motivate the members in farming.
   Aim : they should participate in a Joint Project.

b) Demonstration skill level (16-19 year olds)
   Objective : to teach vocational skills.
   Aim : they should participate in a Demonstration Project.

c) Competition level (20-24 year olds)
   Objective : to develop self-confidence in farming.
   Aim : they should participate in a Crop Competition.

After graduating from the 4-H Club, the members are expected to be an efficient group of farmers.

At present, the total number of 4-H Clubs and members in Nepal is 600 Clubs with 1,500 members in 55 districts. 4-H Clubs are not yet organized in 20 districts. In the Lalitpur, Bhaktapur, and Kathmandu districts, there are 37 4-H Clubs with 554 members of which 348 are boys and 206 are girls, as shown in Table 1-12.

(4) Seed Multiplication

The seed multiplication system in Nepal is presented in Figure 1-8. The production of

the stock and foundation seeds is carried out on government farms under the supervision of each division concerned. In the case of vegetable seed, production of the foundation seed is carried out on seven major government horticulture farms under the supervision of the Vegetable Development Division of DoAD.

Most of the commercial seeds are produced in the private sector by contract growers in the areas identified and recommended by DoAD. Such areas are in the vicinity of government farms. AIC also handles commercial seed production. In Jhumka, a cereal seed production farm which produces certified seed is managed by AIC, The organization chart of the Seed Division of AIC is presented in Figure 1-9. In the Kathmandu Valley, there are only two seed multiplication programs (total 20 ha) for radishes and broad-leaf mustard in Bhaktapur (Sirutar and Suryavinayak).

In order to meet the field standards, the growers are technically helped by experts from the government farms of the respective production areas. For certification purposes, the seed crop has to be inspected by a team consisting of an expert from the government farm of the respective production area and a seed inspector from the Seed Development and Quality Control Service Division under DoAD. After the seed crop is recommended for certification by the field inspectors, the growers harvest, clean, grade, and pack the seed with the help of the experts and send it to the Regional Seed Testing and Quality Control Laboratories for verification of its standard. In Nepal, there are five laboratories for seed testing mentioned in Figure 1-7. If the seed in the verification test meets the recommended standard, then the seed is certified or recommended as quality seed. Such seed is procured by the respective seed dealers.

(5) Agricultural Input Supply

Farm inputs such as fertilizer, improved seeds, agro-chemicals, and agricultural tools, are supplied by AIC and private dealers. Most of the fertilizer is provided by AIC, however, it only provides about 25% of the total amount of seed and agro-chemicals. The organization chart of AIC is shown in Figure 1-10. There are no branch offices in the districts of the Kathmandu Valley, so a zonal office (Bagmati Zone) directly covers the three districts. Agricultural inputs are distributed to private dealers, including agricultural cooperatives. The Agricultural Tools Corporation manufactures agricultural tools in Birganj. The tools manufactured are supplied through its branch offices and AIC's branch offices. In the Kathmandu Valley, one branch office exists at Dhobidhara.

The amount of fertilizer distributed in the three districts is shown in Table 1-13 and the average amount supplied to the Study Area is estimated in Table 1-14. Mainly complex and urea are supplied by AIC. In addition, comparisons between the actual and recommended dosage of fertilizer were made and are shown in Table 1-15. Generally, it is considered that distributed quantities of nitrogen are rather high in the Study Area. The quantities are summarized below:

(unit : kg/ha)

		Present Quantity (N : P : K)			Recommended Quantity (N : P : K)		
Average Amount of Fertilizers Supplied by AIC		122	25	1			
Actual Dosage, determined by the Farm Survey	Paddy	146	20	0	100	30	30
	Wheat	127	13	0	80	40	20
	Maize	106	11	0	120	75	50
	Potato	240	39	0	150	60	350
	Mustard	86	40	0	34	22	28
	Vegetables	117	69	0	100	60	50

The distribution of seeds is generally carried out by the private dealers and/or AIC, as shown in Figure 1-11. Seeds are purchased from farmers including contract farmers, by

dealers or AIC and then sold to the growers. The procurement price under a contract between AIC and the growers is fixed by the Government's National Seed Board. The amount of seed distributed by AIC is shown in Table 1-16. With regard to the total demand for seed, the distribution of seed by AIC is very limited. According to AIC information, the seed distribution rate of each crop was 0.39% for paddy, 2.81% for wheat, 0.45% for maize, and 15% for vegetables, in 1991/92. In the Kathmandu Valley in 1991/92 the seed distribution rate of paddy, wheat, and maize was estimated at 0.8, 2.3, and 3.6%, respectively, as shown in the following table:

Crops	Demand			Supply	
	Seed rate (kg/ha)	Planted area (ha)	Demand (ton)	Supply (ton)	Distribution (%)
Paddy	53	18,500	980	8.1	0.8
Wheat	114	16,500	1,880	42.9	2.3
Maize	23	11,900	270	9.6	3.6

The pesticide consumption figures are presented in Table 1-17. According to the farm survey, the use of agro-chemicals such as pesticides, herbicides, and fungicides is uncommon in the Study Area.

(6) Agricultural Credit

ADB/N, which was established in 1968, is the only institutional agricultural credit system in Nepal. Under the head office located in Kathmandu, there are seven supervision and control offices and two main branch offices in Nepal, as shown in Figure 1-12. The Kathmandu Valley is covered by three branch offices, i.e. Lalitpur, Bhaktapur, and Kathmandu ADB/N branch offices under the control of the Kathmandu Supervision and Control Office.

There are several kinds of loans now provided by ADB/N, which are summarized in the following table:

Description	Loan-Term	Interest Rate	Collateral
a. Production Loan	within 1 year	18% per year	80% of the total land value
b. Marketing Loan	6 months - 1 year	20% per year	80% of the total land value
c. Agri-processing	1-2 years	20% per year	80% of the total land value
d. Agri-business/industry	2-5 years	19% per year	80% of the total land value
e. Agri-tools, Irrigation, and Biogases	2-5 years	18% per year	80% of the total land value
f. Horticulture (short)	2-5 years	18% per year	80% of the total land value
g. Horticulture (long)	7-10 years	18% per year	80% of the total land value
e. Godown, Cold Storage	10 years	20% per year	80% of the total land value

In 1991/92 the disbursement amount of the Agri-business and Agri-industry loan and Marketing loan amounted to nearly 90% of the total disbursement amount of the three districts. The Agricultural production loan and Agri-tools and Irrigation loan amounted to 5% and 4.6% of the total disbursement amount, respectively, as shown in Table 1-18. The total disbursement amount for the area increased every year, except in 1990/91, reaching NRs.83 million in 1991/1992, which was about 50% higher than that of 1989/90. The total repayment amount also increased every year, reading NRs.60 million in 1991/92, which was 72.6% of the loan repayment amount in 1989/90. However, the accumulated outstanding loan amount has been increasing and by the end of the 1991/92 fiscal year it reached NRs.211 million.

In order to provide agricultural credit for landless small farmers without collateral, SFDP was established by the ADB/N in 1976. The outline of SFDP is shown in Table 1-19 and summarized below.

Small farmers should be organized at a village level into groups of five to 25 members. Each group should have an elected group leader. At least once a month, a meeting should be held in order to discuss various individual and group problems. Group plans for credit needs and social activities should be prepared by farmers themselves. Requests for credit should be submitted to the SFDP. The group accepts joint responsibility for loans received, their proper utilization, and repayment. If a member fails to repay the loan without reasonable cause, the group may be refused further credit.

Credit oriented economic activities in SFDP are as follows :

a) Cereal and cash crop production
b) Livestock development
c) Horticultural development
d) Farm mechanization
e) Irrigation projects
f) Cottage and rural industries
g) Marketing of agricultural and cottage industry products
h) Bee keeping and sericulture
i) Production of medical plants

In addition, the following community level projects are included :

a) Community irrigation projects
b) Community storage construction
c) Community fish farming
d) Community agricultural processing unit
e) Community biogas plant

Of the three districts in the Study Area, SFDP was firstly applied to Bhaktapur district in 1978/79, where it covered 3 villages. Then in 1982/83 it was applied in Lalitpur district, where it covered 8 villages. In Kathmandu district, it commenced in 1983/84, where it covered four villages. In 1992/93, the total number of villages covered in the three districts was 15 and the total disbursement amount, repayment amount, and outstanding amount were NRs.5.9 million, NRs.5 million, and NRs.19.8 million, respectively, as shown in Table 3-18.

Despite the above, the institutional agricultural credit system in Nepal has been strengthened over the last 25 years and non-institutional credit sources such as friends, relatives, traders, and money lenders are playing a more important role.

The number of farmers who borrowed an ADB/N loan in 1991/92 in the three districts was 7,952, which was only 8.2% of the total number of farm households.

1.2 Agro-economy and Social Conditions

1.2.1 Marketing and Prices

(1) Marketing System for Major Crop Products

The major crops (paddy, wheat, and maize) produced are mainly for home consumption purposes only. A farmer who plants more than 0.3 ha of paddy would have a surplus of paddy, other than that for self-consumption. The total holding size of these farmers would be more than 0.6 ha. The number of farmers with more than 0.6 ha is only about 10% of the total number of farm households. Accordingly, most of the farmers in the Study Area

do not sell any main cereal products, even if they have to buy some rice from the local market.

The main agricultural products marketed in the Kathmandu Valley are vegetables, even though the total planted area is quite limited at present.

The largest vegetable market is Kathmandu, the capital city of Nepal, which has an urban population of about 414,000. In addition, the populations of the Lalitpur and Bhaktapur municipalities are mostly urban and amount to about 117,000 and 61,000, respectively. These urban populations are constant consumers of vegetables. A estimated amount of 61,000 tons of vegetables are purchased annually, as shown in Table 1-20. In addition, in 1992/93 about 1,000 tons of vegetables were consumed by 334,000 tourists in hotels and restaurants.

For supplying vegetables there are several vegetable market centres in and around Kathmandu City. The largest market among these centres is KWM which is located in the central part of Kathmandu. It maybe referred to as a wholesale market, however, functionally there is no difference between it and other vegetable market centres, except that the minimum amount handed is set at about 5 kg. There is no auction, no grading, and no standards for packing. The annual amount handed at KWM was about 29,000 tons in 1992/93, which was about 47% of the total amount handed by the main vegetable markets, as shown in Table 1-21. Other major vegetable market centres in Kathmandu are Mahaboudha/Bir Hospital, Ason, Ranamukteshowar, Baneshwor, Maitidevi, and Maru. In Lalitpur, Sasto Bazaar and Mangal Bazaar and in Bhaktapur, Thimi Bazaar, Sukuldhoka, and the Trolley bus park, are the major vegetable market centres.

Marketing channels for vegetables in the Study Area are illustrated in Figure 1-13.

(2) Marketing System for Farm Inputs

The Kathmandu Valley is the highest farm inputs consuming area in Nepal. Most farmers use manure, about 10 tons/ha, purchased from neighbouring livestock farmers. According to the farm survey, the average amount of chemical fertilizer consumed is more than 300 kg/ha/crop. These chemical fertilizers are monopolistically distributed by AIC. In the Kathmandu Valley, AIC distributes chemical fertilizers and seed through appointed dealers, including cooperative societies and private dealers, which amount to 127 in Lalitpur, 240 in Bhaktapur, and 398 in Kathmandu districts, respectively. Agricultural chemicals are not only sold by AIC but also by private dealers.

The major marketing channels for supplying of agricultural inputs are illustrated in Figure 1-14. The dealer's commission from the sale of agricultural inputs is set by AIC, as shown in the following table:

Kind	Private Dealer	Cooperatives
Fertilizer	3.5% of Price	3.5% of Price
Cereal Seed	10.0% of Price	10.0% of Price
Vegetable Seed	15.0% of Price	15.0% of Price
Pesticide/Insecticide	5.0% of Price	6.0% of Price
Agricultural Tools	5.0% of Price	6.0% of Price

The prevailing AIC prices of agricultural inputs are shown in Table 1-22.

(3) Inventory of the Agro-industries and the Post-harvest and Marketing Facilities

According to the National Sample Census of Agriculture of 1991/92, 41,122 farmers owned 41,418 threshers in the Kathmandu Valley. Therefore, about 42% of the total number of farmers in the Valley possess threshers, where each thresher covers about 0.75 ha of farmland. If a thresher is limited to only paddy cultivated areas, it can cover about 0.45 ha in

the Kathmandu Valley.

Most of the farmers reap paddy with sickles, and threshing is carried out manually using a pedal thresher which is either owned or borrowed. Winnowing is carried out manually using the traditional method. After paddy has been dried it is kept in bamboo baskets in the corner of the house. When people need rice for consumption, they bring paddy to the nearest rice mill for processing. In most of the communities or wards, there is a traditional water mill which is owned by a group or large farmer. Some of these are still operating, but recently 164 commercial rice mills were developed in the area, as shown in Table 1-23. The average capacity of a rice mill is estimated at about 500 tons/year. The total capacity of these rice mills is estimated at 82,000 tons/year. In 1991/92 the total amount of paddy produced in the area was 83,130 tons. Therefore, the present post-harvest facilities are sufficient for processing paddy in the area.

In recent years, the number of agro-based processing industries have increased in the Valley. At present the number small-scale agro-based factories producing potato chips, noodles, bean curd, bread, and cakes, etc. is 74, as shown in Table 1-23. Rather large-scale agro-based industries registered in the Department of Industry are listed in Table 1-24.

Most of the factories procure their raw materials such as wheat flour, maize grits, and broken rice mainly from other districts (about 53% of the total raw materials). Imported raw materials account for about 34% and those purchased in the Kathmandu Valley account for about only 13% of the total amount of raw materials or 4,600 tons.

Most of the market centres operate in open areas either on road squares or along the roads, except for KWM. KWM was established in 1987 on 2.05 ha of land. Some time later, shades were constructed with the assistance of FAO and UNDP. Currently, a master plan is being initiated in order to construct a well equipped fruit and vegetable wholesale market centre in this area. The main components of construction in the plan are multipurpose shades, service buildings, and cold storage areas. For the construction of these facilities, UNCDF has provided grant assistance of US$4,605,684. The construction works are expected to be completed in 1995.

(4) Price Mechanism for Major Crops

Information and data regarding the prevailing farm-gate price of vegetables in 1992/93 were collected from DADO of each district in the Valley and supplementary information and data were collected from vegetable growers in the vegetable model area and vegetable spot area, together with the sample farm survey. For information and data concerning the wholesale and retail prices prevailing in the markets in the three districts, the data were obtained from the Agricultural Marketing Development Division of DoAD.

The prices of vegetables mostly fluctuate according to the harvesting period, as shown in Table 1-25 and 1-26. Even in KWM, prices were decided by face to face trading between sellers and buyers. Auctions and grading have not yet been introduced yet. The average prices of major vegetables are summarized in Table 1-27.

(5) Supply and Demand Balance of Crops

The Agricultural Marketing Development Division of DoAD worked on the food balance situation regarding cereals according to the district, from 1987 to 1992. According to the food balance situation in Nepal described in the "Bulletin - Consumptive Cereals of Kingdom of Nepal 1987-92", in recent years self-sufficiency was generally achieved in Nepal, as shown in Table 1-28. However, some people in the Kathmandu Valley always have an insufficient amount of food grain mainly because of the rapid increase of the urban population. The main cereals produced in the Kathmandu Valley are paddy, wheat, and maize, which are mostly consumed by farmers themselves. About 100,000 tons of rice are distributed annually

by the Terai region, which is the granary of Nepal.

About 30% of the total amount of vegetables supplied to KWM in Kathmandu are provided by the Kathmandu Valley, except for potatoes and onions which are mainly supplied by India. The other 70% of vegetables are distributed by Nuwakot, Dhading, Kavre, and Makwanpur districts in the hilly region and Bara, Sarlahi, and Dhanukha districts in the Terai region.

1.2.2 Agricultural Cooperative Society

Initially, a Land Reform Saving Corporation was established in 1966, in order to collect the compulsory savings from farmers, which was 5% of their annual production, through ward level committees in each village. The total saving amount was mobilized throughout the country in order to support the Land Reform Program.

Through the daily operation of the Land Reform Saving Corporation, it was expected that every village and ward in the country would be facilitated with banking services and from the collected savings the necessary funds, by direct investment or a form of credit, would be allotted to the field areas under the influence of the Land Reform Program. The remaining savings would be returned to individual depositors with interest.

The credit from the corporation was limited to the following purposes; acquirement of farmland by tenant farmers, improvement of farming, purchase of agricultural tools and implements, construction of godown and storage facilities, investment in small hydroelectricity projects, rural electrification, the cottage industry, cooperative industries, and cooperative farming.

Owing mainly to insufficient business management skills, the corporation was amalgamated with the ADB/N in 1974.

The concept of the cooperative society was constitutionally introduced after the second amendment of the "Constitution of Nepal, 2019" of 1976. Therefore, Agricultural Cooperative Societies (ACSs) were started based on the compulsory saving funds of the country. There was some confusion among member farmers of ACSs. In some ACSs, many of the member farmers did not know that they were in fact members of the Society.

Although ACS is the only systematic farmers organization in Nepal, most of ACSs are not operating well in their present activities and systematization.

The objective of ACSs is to improve the social and economic conditions of farmers. To achieve this objective, business activities such as agricultural input supply, consumer goods supply, farm credit, and saving are specified in the basic regulations of ACS.

In order to promote ACSs, a DCO has been set up in each district under the control of MoA, since 1980. According to the information obtained from DCO in Lalitpur, Bhaktapur, and Kathmandu districts, the present organization of ACS has been summarized in Table 1-29.

In each district, a District Cooperative Union (DCU) was set up, but no federation was established at a National level. Under each DCU, there are 9 primary ACSs in Lalitpur district, 9 in Bhaktapur district, and 15 in Kathmandu district.

The percentage of villages which are not covered by any ACS is about 5% to 7% of the total number of villages in the three districts. Each ACS covers an average of 3.7 villages, ranging from 2 to 11 villages.

The systematization rate of farmers is 50% in covered villages and 40% of the total number of villages in the three districts.

There are 33 ACSs, of which two are not in operation and 31 handle farm input supply as their only business activity. However, most of the Societies', except for two, bank accounts were in the red in 1991/92, as shown in Table 1-29.

Most of the ACSs in the Study Area, initiated by the Government through the DCO of each district, are not active in credit, savings, and sales of farm products. However, a new independent farmers' organization has been set up to solve the inhabitants' problems.

CSSC in Bhaktapur is a kind of agricultural credit cooperative organized by the farmers themselves. The purpose of this organization is to solve the common problems which occur for the members who live in communities where poverty, ignorance, unemployment, inefficient working conditions, and environmental pollution exist.

CSSC in Bhaktapur was established in November 1991 with 51 members. At present, there are 85 members, of which 87% live in Nagadesh Village, 11% in Chapacho Village, and 2% in Bode Village. More than 90% of the members are from the Newar tribe.

Generally, a monthly saving amount of NRs.50 to NRs.100/member was collectively deposited in the CSSC account, which amounted to NRs.151,400 at the end of May 1993. The total amount saved was lent to the members in the form of loans varyig from NRs.5,000 to a maximum NRs.25,000. These loans were used for acquisition of land, businesses, and cottage industries, etc. This area is one of the most developed areas for vegetable production and was designated a Vegetable Model Area by the Agricultural Sub Centre and DADO in Bhaktapur district. Most of the members of CSSC are vegetable growers. They jointly invest in the construction of tube-wells or purchase water pumps for groups of around ten members. These members usually discussed vegetable growing techniques and assisted in acquiring farm inputs and selling farm products. Other than these daily farm activities, CSSC contributed to health care and the sanitation of resident's common yards. Free training in sewing was also provided for groups consisting of ten women members.

In order to minimize the consumption of firewood, by reducing the number of trees being cut down and by stopping environmental pollution to some extent, CSSC bought large kerosene stoves and lent them to members in order to replace firewood stoves used for the preparation of various foods on special occasions, which generally occurs once a month in the Newar tribe's communities.

In addition to cooperative saving, the current activities of CSSC are summarized as below:

a) Provision of scholarships in order to the educate of two children from the families of CSSC members, who possess weak economic background.

b) Provision of free sewing training for groups consisting of ten members.

c) Provision of free distribution of sanitation equipment/materials.

d) Provision of a home delivery service for chemical fertilizer.

Further more, future services of CSSC may include sales/distribution of milk, payment of electricity bills, and payment of water bills.

1.2.3 Social Infrastructure

According to the demographic information obtained form the Central Bureau of Statistics, one of the demographic characteristics in the Study Area is that the male population exceeds the female population, which are of 51.4% and 48.6% respectively. However, in the whole of Nepal the male population is less than the female population, which are 49.9% and

50.1%, respectively. In addition, the annual population growth rate during 1981 to 1991 in the Study Area was as high as 3.7%, while that in whole Nepal was 2.1%. These figures show that rapid population increase is taking place in the Study Area. Regarding the age composition of the population, the percentage of 10 to 64 year olds, who are considered to be the economically active population, is estimated at 75% in the Study Area, which is higher than the national average of 66.7%, as shown in Table 1-30.

Based on the farm survey, the literacy rate in the Study Area is estimated at 65% of which 20% would just be able to read and write and 21% have been educated to primary level, as shown in Table 1-31. The percentages of the literate population with lower secondary, secondary, and higher education are estimated at 15%, 27%, and 17%, respectively.

The proportion of major ethnic/caste groups living in the Study Area are estimated as 62% Newar, 14% Brahmin, and 23% Chettri. In most cases, one ethnic/caste population is clustered in one area and another ethnic/caste population in another area. Whenever more than one ethnic/caste population is residing in an area, they live in harmony in a traditional way.

Exchanging family labour, locally known as "*Perma*", is widely practiced in the Study Area as the traditional system. No cash is paid for exchange labour, instead an equivalent amount of labour time/effort is returned. The exchange labour, "*Perma*" system makes it easy for farmers to manage high labour demands during peak and crucial farming periods. Usually farmers' own labour and the exchange labour constitute 80% and 20% of the total amount of family labour, respectively. Owing to religious beliefs, farmers in the Kathmandu Valley do not use bullocks for labour in farming or for other purposes.

There is no information available regarding the number of radios owned by households in the Study Area. However, it is believed that a significant number of farmers in the Study Area would already have radios. Recently, every morning, Radio Nepal has started broadcasting the previous days' prices of vegetables in KWM.

2. FEASIBILITY STUDY FOR THE SELECTED 13 SCHEMES

2.1 Agriculture

2.1.1 Population and Labour Forces

The Project Area, which includes the 13 selected model schemes, is located in three districts ; Kathmandu, Bhaktapur, and Lalitpur districts of the Central Development Region. It includes 24 VDCs and covers 116 wards. The name of VDCs in each scheme is shown in Table 1-32.

In total the Project Area covers about 3,070 ha and about 51,480 people live in 8,630 households. Of which about 80% or 6,820 households are farmer owned. In addition, about 370 farmers who live outside the scheme area are in fact cultivating in this area. Thus the total number of farm households in the scheme area is estimated at about 7,190, as shown in Table 1-33. The schemes where a majority of the farmers live outside resident farmers are such schemes as AK-07 Dakshinkali and AB-02 Bidol. Of 13 schemes, ten are cultivated by resident farmers only. The average size of a farm family in each scheme ranges from 5.3 to 6.5, an average size of 5.8.

In general, the age group between 10 - 60 years old is considered to be the economically active population. The Economically Active Population (EAP) amounts to 57% of the total farm population of the Project Area, which ranges from 62.5% to 80.0% in each scheme. Furthermore, EAP for the agricultural sector varies from 40.6% to 65.9% in each scheme, and on average, 46.9% in the Project Area. The economically active labour force available for farming in the Project Area is estimated based on the following assumptions :

1. Yearly workable days / person : 365days x 80% = 292days
2. Total labour force / year : TFP x EAP x EAA x 292
   - TFP : Total farm population
   - EAP : Economically active population rate
   - EAA : EAP for agricultural sector rate

As shown in Table 1-34, the labour force available for farming activities in the Project Area is 4.03×10^6 per year .

2.1.2 Landholding and Land Tenure

The results of the farm survey indicate that the average farm size in the Project Area is 0.24 ha, which is a little smaller than the 0.28 ha of average of the whole Kathmandu Valley. The average farm size in each scheme varies from the smallest size of 0.13 ha in the AL-20 Thika Bhairaw-II scheme to the largest size of 0.41 ha in the AK-04 Biswambhara scheme. Over 50% of the total number of farmers have land less than 0.2 ha in landholding size in the Project Area. The distribution of farm households according to the landholding size in the Project Area is shown in Table 1-35 and summarized below:

Landholding size	Distribution (%)
under 0.2 ha	53
0.2 - 0.5 ha	29
0.5 - 1.0 ha	16
1.0 ha - above	2

The schemes where the majority of farm are classified as a marginal size (less than 0.2ha) are the AK-05 Boshan, AK-14 Indrayani, AB-14 Mahadev Khola, and AL-19 Thika Bhairaw-I schemes. Large-scale farmers, owning more than 1 ha , are generally very few in number. Farmers who own more than 1 ha of land account for only 2.0% of the total number

of farmers. It is reported that there is not a large number of absentee landlords in the Project Area.

As for the land tenure condition in the Project Area, about 74% of the farmers own their farmland, 38% of which are owner cultivators and 36% are owner cum tenant cultivators, as shown in Table 1-36. The number of tenant farmers are estimated at 26% of the total number of farmers in the Project Area. It is reported that there is not a large number of absentee landlords in the Project Area. In the AB-14 Mahadev Khola scheme, 80% of the farmers are tenant farmers followed by 59% in the AK-14 Indrayani scheme, and 51% in the AL-10 Kotkhu scheme. In the AL-19 Thika Bhairaw-II scheme, the majority of farmers are owner cultivators, estimated at 60 % of the total number of farmers in each respective scheme.

2.1.3 Agricultural Production

(1) Crops and Cropping Pattern

The cropping year extends from May of one year to April of the next and has a summer and winter season. The summer season (or rainy season) lasts from May to October. During this season, most of the Project Area is under paddy cultivation. In the winter season (or dry season), wheat is the main crop followed by potatoes, mustard, and legume crops such as broadbeans and garden peas.

Like the Kathmandu Valley, "paddy - wheat " is the dominant cropping pattern in the Project Area. The present cropping pattern in each scheme is illustrated in Figure 1-15 and summarized below :

Irrigated Land		Rainfed Land	
Paddy - Early potatoes - Late potatoes	(1 %)	Maize - Mustard	(3 %)
Paddy - Wheat	(69 %)	Maize - (fallow)	(3 %)
Paddy - Potatoes	(11 %)		
Paddy - Mustard	(7 %)		
Paddy - Broad beans	(2 %)		
Paddy - Garden peas	(1 %)		
Paddy - (fallow)	(3 %)		

Note: ( ) is extent rate of the land under the cropping pattern to the total farmland area.

Paddy is planted at the onset of the monsoon season, which is from June to July, and is harvested from October to November. The Project Area basically depends upon rainfed agricultural conditions, therefore, paddy is planted depending on rainfall beginning. Wheat is the major winter crop in the Project Area. It is planted from November to December and harvested from April to May. Mustard is also planted from November to December and harvested from February to March. Generally the cultivation of potatoes is carried out from December to April. In the Shali Nadi scheme area (AK-25), farmer plant potatoes twice a year. Early potatoes are planted after harvesting paddy, from October / November, and are harvested 2 to 2.5 months later, in January. After land preparation, within 2 weeks after harvesting early potatoes, late potatoes are planted. Harvesting is in April. Leguminous crops such as broadbeans and garden peas, which are also cultivated in the winter season are, sown from November to December and harvested from March to April.

In the net farmland area of about 1,730, paddy occupies about 1,6216 ha or 94% of the total amount of farmland in the summer season. Mean while on an average, wheat occupies 1,184 ha or 69% in the winter season. Other crops such as potatoes, mustard, maize, broad beans, and garden peas are also cultivated in the winter season, but the cultivated areas are not very large and differ in each scheme area. In particular, the Boshan (AK-05 : Mustard 28%), Dakshinkali (AK-07 : Mustard 35%, Garden pea 37%), Shali Nadi (AK-25 : Potato 52%), and Lubhu (AL-13 : Broad bean 15%) schemes are characterized by each winter crop. The planted

area in relation to the main crops, in each scheme area, is shown in Table 1-37 and summarized below:

Crop	Planted area (ha)	%
Paddy	1,616	93.6%
Maize	91	5.3%
Wheat	1,184	68.6%
Potatoes	229	13.3%
Mustard	163	9.4%
Broad beans	40	2.3%
Garden peas	25	1.4%
Total	3,349	193.9%

As shown in the above table, the total planted area is 3,349 ha, thus the cropping intensity in the Project Area is estimated at 194%, which is higher than that of 173% in the whole Kathmandu Valley. Of the 13 schemes, the highest cropping intensity is 207% in the AK-25 Shali Nadi scheme.

(2) Farming Practices

Farming practices in the Project Area are characterized by i) intensive manual farming and ii) an extremely high supply of chemical fertilizer. The average amount of farm inputs in the Project Area such as seeds, fertilizers, and labour requirements are summarized below and shown in detail in Table 1-38.

Crop	Seed	Fertilizer (kg/ha)		Compost	Human labour (man-day)		
	(kg/ha)	Complex	Urea	(kg/ha)	Family	Hired	Total
Paddy	50	211	151	2,951	152	64	216
Wheat	139	160	133	1,926	89	35	124
Maize	23	84	87	2,674	96	18	114
Potatoes	695	207	157	5,295	187	39	226
Mustard	228	16	74	611	95	17	108

Like the Kathmandu Valley, most of the farmers in the Project Area are using moderate quantities of chemical fertilizers on their crops. Farmers use mostly urea and complex. The amount of chemical fertilizer applied is higher in this area than any other part of Nepal, especially in the case of paddy cultivation, where the fertilizer applied is higher than the recommended level. A comparison between the amount applied and the amount recommended in the Project Area, has been carried out in Table 1-39. Besides urea and complex, compost manures are used by farmers, but the amount applied is different in places and depends mainly on the number of livestock raised by farmers. In urbanized areas, some farmers do not keep any livestock and do not apply compost manure to their farmland.

Farmers in Nepal generally use bullocks for land preparation. However, in the Project Area, these draught animals are not used for farming activities. Therefore, only human labour is extensively and intensively used in the farming activities.

Most of the farmers are using improved varieties of seeds. According to the farm survey, it was observed that the crops previously produced by farmers themselves were the main source of seed. They keep these seeds for their own stock and for exchanging with other farmers in order to purchase new varieties of seed. The average apply rate of improved varieties of seed is shown below:

Paddy		Wheat		Maize		Potato	
Taichung-176,242	60%	Lerma Rojo 64	60%	Rampur Yellow	22%	British Cardinal	96%
Masuli	30%	Lerma 52	35%	Khumal Yellow	78%	Kufri Joti	4%
Khumal-2,4	2%	others	5%				
Local (Pokhareli)	8%						

Agro-chemicals such as pesticides, herbicides, and fungicides are not generally used in the Project Area.

The general farming practices for major crops are briefly described below:

Paddy

The farming practices for paddy are not very different in the 13 scheme areas. The most popular varieties of improved paddy in the Project Area are *Taichung-176,242* followed by *Masuli., Khumal-2, and Khumal-4* . The local varieties of paddy, *Pokhareli Masino* is also cultivated by several farmers in some areas. The sowing of seeds is generally carried out in nursery beds in May/June and transplanting in the main field is carried out in July/August. Preparation of the main field is carried out by digging and ploughing. Organic manure is applied during land preparation and nitrogenous chemical fertilizer is applied in split doses, half at the time of land preparation and the remaining half as the top dressing. Weeds are controlled manually. Plant protection is not practiced unless there is severe damage. Harvesting is conducted with sickles in October/November. Threshing is conducted using pedal threshers and winnowing is conducted using the traditional method.

Maize

Maize is mostly grown in rainfed upland conditions. Improved varieties of maize such as *Khumal Yellow* and *Rampur Yellow* are widely grown in the Project Area. Manure is broadcasted to the field prior to land preparation. Seeds are either broadcasted or line sown in May. Weeding is carried out manually. Using nitrogenous fertilizers for top dressing is a common practice. Harvesting starts in August. Green maize leaves are lopped and used for animal fodder.

Wheat

The improved varieties of wheat, *Lerma Rojo 64* and *Lerma 52* are widely grown. However, in some areas, particularly in the upland areas, local varieties of wheat are also grown by some farmers. Land preparation is carried out manually in October/November. Seeds are generally broadcasted. Weed control is uncommon in the Project Area. Chemical fertilizers are widely used and manure is also used. The crop is harvested with sickles in April/May and threshed using threshers after drying. The grains are winnowed using the traditional method.

Potatoes

Potatoes are generally planted in January and harvested in April / May. The amount of seed rate used is about 700 kg/ha. *British Cardinal* is widely used by farmers. After land preparation, potatoes are planted. Organic manure, complex, and urea are the main fertilizers used. The amount of fertilizers applied is high compared with the other main crops, as shown in the Table 6-7. Weeding is carried out two or three times during the growing period. Harvesting is conducted in April manually. In some areas where irrigation water is available, farmers can cultivate potatoes twice a year. In this case early potatoes are planted in October / November and harvested in January, and then late potatoes are cultivated from late January to April / May.

Mustard

In the Study Area, the adoption of improved varieties of mustard has been limited. Mostly local varieties of mustard, namely, *Kalotori* and *Baltori* are grown. This crop is generally grown under residual moisture conditions and makes use of the fertility of preceding crops and is cultivated using either the monoculture method or relay cropped with paddy. Sometimes it is cultivated with wheat or barley as a mixed crop. Farmers prefer to use a little fertilizer for this crop. Weeding and thinning are carried out at the same time. Harvesting is conducted by pulling out the matured plants. The plants are threshed with wooden sticks. The grains are then winnowed using the traditional method.

Legumes

Broad beans and garden peas are major legumes crops grown in the Project Area as winter season crops. They are grown using minimum tillage operations. Broad beans are generally grown as relay crops with paddy. It is broadcasted two weeks before rice cultivation. In the case of garden peas, the matured plants are mostly pulled by hand and threshed with sticks manually. In the Dakshinkali Project Area (AK-07), garden peas are cultivated on 37% of the total amount of cultivated land. Broad beans are cultivated in the Lubhu (AL-13 : 20ha), Mahadev Khola (AB-14 : 3 ha), Thika Bhairaw-I (AL-19 : 15ha) and Thika Bhairaw-II (AL-20 : 2ha) schemes.

The annual labour force in the Project Area is estimated at 4.03×10^6 per year and only 15% of the available yearly labour force has been absorbed in the present farming practices. Present labour balance of each schemes are summarized in Table 1-40 and shown in detail in Table 1-41. Furthermore, even at the peak requirement period in July , 33% of the available labour force is participating in present farming activities. The labour force surplus is considered to be sufficient for agricultural activities. The availability of a family labour supply is not a problem in the Project Area.

(3) Crop Yield and Production

The crop yield and production under the present conditions are estimated on the basis of the farm survey results. These results indicate that the crop yield and production are different in each scheme due to irrigation conditions, amount of fertilizer, soil conditions, and so on.

Table 1-42 presents the figures for the crop yield and production of the major crops according to each Project Area. The unit yield of paddy ranges from 3.6 tons/ha to 4.6 tons/ha and is on an average 4.2 tons/ha. The average unit yield, planted area, and total production amount are summarized below:

Crop	Planted Area (ha)	Unit Yield (ton/ha)	Production (tons)
Paddy	1,616	4.2	6,842
Wheat	1,184	2.0	2,343
Maize	91	1.5	133
Mustard	163	0.6	99
Potato	229	9.7	2,227
General	185	10.0	1,853
Early & Late	44	8.5	374

In general, yields of paddy in the Project Area are higher than in other parts of Nepal, even though yields are different every year due to fluctuations in rainfall. Rainfall delays result in yields decreasing due to late transplanting.

(4) Vegetables Cultivation

The farming practices for vegetables vary widely depending upon land location and availability of irrigation water. The main vegetables grown in the Project Area are cauliflower, cabbage, and onions in the winter season and chillies in the summer season. Leguminous crops, such as garden peas in the winter are also important vegetables in the Project Area. Most of the farmers in the Project Area grow vegetables for home consumption purpose only.

According to the vegetable farm survey carried out in the areas surrounding the Project Area, vegetable farmers grow many kinds of vegetables through out the year. They are able to grow vegetables three times a year. Most of the vegetable farmers grow green leaf vegetables such as broadleaf mustard and spinach. Onion and garlic cultivation is also common. The main crops cultivated in the areas surrounding the Project Area are summarized below:

Cole crop	: Cauliflower, Cabbage
Fruit crop	: Chilli, Tomatoes, Brinjal, Sweet pepper
Root crop	: Radish, Carrots
Cucurbit crop	: Cucumber
Leguminous crop	: Garden peas, Cow peas, French beans
Leaf crop	: Broad leaf mustard, spinach, Garden cress
Bulb crop	: Onions, Garlic
Other minor vegetables	: Okra, Turnips, Summer squash, Fenugreek, Coriander, Bitter gourd

Vegetables are cultivated two to three times a year. In the case of cole crop vegetables and fruit crop vegetables, such as cauliflower, cabbage, brinjal, and tomatoes, seedlings are firstly raised in the nursery and later transplanted in the main field. Mean while leaf vegetables, root crops, and leguminous crops are sown using a direct sowing method. Some farmers who have only a small amount of land only grow seedlings, which they sell to other farmers. Farmers grow both local and improved varieties of seed. Most of the improved varieties are obtained from private dealers. Organic manure is supplied during land preparation and top dressing using complex, urea, or potash, is also practised. Farmers use very little plant protection chemicals. The vegetables are harvested over a long period of time, by hand or sickles because they perish quickly. The present vegetable cropping calendar for each season is shown in Figure 1-16.

(5) Livestock

Various kinds of livestock such as buffalo, cow, goats, and poultry are raised in the Project Area. Like the whole Kathmandu Valley animal husbandry contributes little to the farm economy. The practice of not using draught power (particularly bullock) in agriculture in the Valley is the main reason why the role of livestock in the farm economy is not a very important one.

As shown in Table 1-43, the population of livestock in the Project Area is estimated as 4,950 cattle, 1,290 buffalo, and 122,200 chickens. The average number of livestock per farm household is 0.7 cattle, 0.2 buffalo, and 17.9 chickens as summarized below:

Livestock	Nepal		Kathmandu Valley		Project Area	
	Total ('000 head)	No./FH* (head)	Total ('000 head)	No./FH (head)	Total ('000 head)	No./FH (head)
Cattle	6,246	8.3	82	0.8	5	0.7
Buffalo	3,058	4.1	32	0.3	1	0.2
Goats / Sheep	6,318	8.4	120	1.3	7	1.0
Chickens	13,496	17.9	1,096	11.3	122	17.9
Ducks	390	0.5	10	0.1	1	0.1

Note: * average livestock holding number per farm household

2.1.4 Agricultural Supporting System

(1) Agricultural Extension Services

Agricultural extension services in Nepal are carried out under the responsibility of the Director General of DoAD. The Regional Director of the Regional Directorate of Agricultural Development is responsible for the coordination and supervision of agricultural development programs in the region, including agricultural extension services. Under the supervision of the Regional Director, DADO is responsible for all activities concerning the agricultural development programs in the district. Agricultural extension services in each district are carried out by field level extension workers stationed at each Agricultural Service Centre: 6, 6, and 7 in Lalitpur, Bhaktapur and Kathmandu districts, respectively. Each Agricultural Service Centre covers 6.8 villages and 1,600 ha of cultivated land in the three districts and are staffed with 7.5 extension workers, consisting of 2.5 Junior Technicians (JT) and 5 Junior Technical Assistants (JTA), on an average. The average number of villages and farm families and the average cultivated area covered by a centre per extension worker is 0.9 villages, 680 farm families, and 209 ha, respectively. Regarding the number of extension workers, it is observed that there is no shortage in this area. (Details are presented in Section 1).

The Project Area is covered by 11 Agricultural Service Centres, with 16 JTs and 34 JTAs. In the Project Area 59 result demonstration farms and 24 production demonstration farms exist. The number of mini kit distribution programs for kitchen gardening is 557 in total. The name of the agricultural sub-centres and the number of demonstration farms in each scheme are shown in Table 1-48.

(2) Agricultural Credit

ADB/N which was established in 1968, is the only institutional agricultural credit system in Nepal. Under the head office located in Kathmandu, there are seven supervision and control offices and two main branch offices in Nepal . The Kathmandu Valley is covered by three branch offices, i.e. Lalitpur, Bhaktapur, and Kathmandu ADB/N branch offices under the control of the Kathmandu Supervision and Control Office.

There are several kinds of loans now provided by ADB/N, which are summarized in the following table:

Description	Loan-Term	Interest Rate	Collateral
a. Production Loan	within 1 year	18% per year	80% of the total land value
b. Marketing Loan	6 months - 1 year	20% per year	80% of the total land value
c. Agri-processing	1-2 years	20% per year	80% of the total land value
d. Agri-business/industry	2-5 years	19% per year	80% of the total land value
e. Agri-tools, Irrigation, and Biogases	2-5 years	18% per year	80% of the total land value
f. Horticulture (short)	2-5 years	18% per year	80% of the total land value
g. Horticulture (long)	7-10 years	18% per year	80% of the total land value
e. Godown, Cold Storage	10 years	20% per year	80% of the total land value

In 1991/92 the disbursement amount for the Agri-business and Agri-industry loan and Marketing loan amounted to nearly 90% of the total disbursement amount of the three districts. The Agricultural production loan and Agri-tools and Irrigation loan amounted to 5% and 4.6% of the total disbursement amount, respectively. The total disbursement amount for the area increased every year, except in 1990/91, and reaching NRs.83 million in 1991/1992, which was about 50% higher than that of 1989/90. The total repayment amount also increased every year and reaching NRs.60 million in 1991/92, which was 72.6% of the loan repayment amount in 1989/90. However, the accumulated outstanding loan amount has been increasing and by the end of the 1991/92 fiscal year it reached NRs.211 million.

In order to provide agricultural credit for landless small farmers without collateral, SFDP was established by ADB/N in 1976.

Details regarding agricultural credit are presented in Section 1.

(3) Farmers' Organization and Cooperative

Initially, a Land Reform Saving Corporation was established in 1966, in order to collect the compulsory savings from farmers, which was 5% of their annual production. Through the daily operation of the Land Reform Saving Corporation, it was expected that every village and ward in the whole country would be facilitated with banking services. Owing mainly to insufficient business management skills, the corporation was amalgamated with ADB/N in 1974.

Therefore, ACSs were started based on the compulsory saving funds. There was some confusion among member farmers of ACSs. In some ACSs, many of the member farmers do not know that they were in fact members of the Society. In each district, a District Cooperative Union (DCU) was set up, but no federation was established at a national level. Under each DCU, there are 9, primary ACSs in Lalitpur district, 9 in Bhaktapur district, and 15 in Kathmandu district. Most of ACSs in the Project Area are not active in credit, savings, and sales of farm products. CSSC in Bhaktapur is a kind of agricultural credit cooperative organized by the farmers themselves. It was established in November 1991 with 51 members and at present there are 85 members. A monthly saving amount of NRs.50 to NRs.100 per member was collectively deposited in the CSSC account, which amounted to NRs.151,400 at the end of May 1993. The total amount saved was lent to the members. These loans were used for the acquisition of land, businesses, and cottage industries, etc. Most of the members of CSSC are vegetable growers. They jointly invest in the construction of tube-wells or purchase water pumps for groups of around ten members. These members usually discussed vegetable growing techniques and assisted in acquiring farm inputs and selling farm products.

2.2 Agro- economy

2.2.1 Agricultural Marketing

(1) Marketing and Price of Agro-products

The major crops (paddy, wheat, and maize) produced are mainly for home consumption purposes only. Most of the farmers in the Project Area do not sell any main cereal products. The main agricultural products marketed in the Kathmandu Valley are vegetables, although the total planted area is quite limited at present.

The Kathmandu, Lalitpur, and Bhaktapur municipalities have urban populations of about 414,000, 117,000, and 61,000, respectively. These urban populations are constant consumers of vegetables. A total amount of 61,000 tons of vegetables are purchased annually. The amount handled annually by KWM which supplies the vegetables, was about 29,000 tons in 1992/93 or about 47% of the total amount handled by the main vegetable markets.

According to the food balance of Nepal, self-sufficiency has been generally achieved in Nepal. However, some people in the Kathmandu Valley always have an insufficient amount of food grain. About 100,000 tons of rice are distributed annually by the Terai region. As for vegetables, 30% of the total amount supplied to KWM is provided by the Kathmandu Valley. The remaining 70% of the vegetables are distributed by other districts in the hilly and Terai regions.

Information and data regarding the prevailing farm-gate price of vegetables in 1992/93 were collected from DADO in each district in the Valley and supplementary information and data were collected from vegetable growers in the vegetable model area and vegetable spot area, together with the sample farm survey. For information and data concerning the wholesale and retail prices prevailing in the markets in the three districts, the data were obtained from the Agricultural Marketing Development Division of DoAD.

The prices of vegetables fluctuate according to the harvesting period. Even in KWM, prices were decided by face to face trading between sellers and buyers. Auctions and grading have not yet been introduced. The average prices of major vegetables are summarized in Table 1-44.

Details of the marketing and price of agro-products are presented in Section 1.

(2) Supply and Price of Farm Inputs

Chemical fertilizers are monopolistically distributed by AIC, through appointed dealers totalling 127 in Lalitpur, 240 in Bhaktapur, and 398 in Kathmandu districts, including the cooperative societies and private dealers. Mainly complex and urea are supplied through AIC. The amount of fertilizer distributed in the Kathmandu Valley is about 20,700 tons or 11% of the total amount distributed in the whole of Nepal in 1991/92. The Kathmandu Valley is the highest farm inputs consuming area in Nepal. The average amount of fertilizer supplied to the Kathmandu Valley is rather high compared to the national average, as summarized below:

(unit : kg/ha)

Supply Amount in Nutrient Content	(N	:	P	:	K)
Nepal	22		8		1
Kathmandu Valley	209		42		1

The distribution of seeds is generally carried out through private dealers and/or AIC. Seeds are purchased from farmers including contract farmers, by dealers or AIC and then sold

to the growers. The procurement price under a contract between AIC and the growers is fixed by the Government's National Seed Board. The amount of seed distributed by AIC in 1991/92 in the Kathmandu Valley is 8.1 tons for paddy, 42.9 tons for wheat, and 9.6 tons for maize. In relation to the total demand for seed, the distribution of seed by AIC is very limited. According to AIC information, the seed distribution rate of each crop was 0.39% for paddy, 2.81% for wheat, 0.45% for maize, and 15% for vegetables, in 1991/92. In the Kathmandu Valley in 1991/92, the seed distribution rate of paddy, wheat, and maize was estimated at 0.8, 2.3, and 3.6%, respectively as shown in the following table:

Crops	Demand			Supply by AIC	
	Seed rate (kg/ha)	Planted area (ha)	Demand (ton)	Supply (ton)	Distribution (%)
Paddy	53	18,500	980	8.1	0.8
Wheat	114	16,500	1,880	42.9	2.3
Maize	23	11,900	270	9.6	3.6

The prevailing AIC prices for agricultural inputs are shown in Table 1-45.

Details of the supply system and price of farm inputs are presented in Section 1.

(3) Post - harvest and Marketing Facilities

Recently, 164 commercial rice mills were developed in the Study area. The total capacity of these rice mills was estimated at 82,000 tons per year. Since the amount of paddy produced in the area was 83,130 tons in 1991/92, the present post-harvest facilities are sufficient for processing paddy in the Study area. (Details are presented in Section 1).

In the Project Area, there are 209 processing facilities in total. The number of processing facilities in each scheme is shown in Table 1-46. There are 6 types of mills such as rice mills, rice & flour mills, flour mills, beaten rice mills, oil mills and rice & flour & oil mills. The processing capacity would be sufficient for the present outputs of agricultural crops.

Most of the market centres operate in open areas either on road squares or along the roads, except for KWM. KWM was established in 1987 on 2.05 ha of land. Currently, a master plan is being initiated in order to construct a multipurpose shade, service buildings, and cold storage areas. For the construction of these facilities, United Nations Capital Development Fund has provided grant assistance of some US$4.6 million. (Details are presented in Section 1).

There are two cold storage buildings in the Kathmandu Valley with a total capacity of 3,000 tons. These are used mainly for seed potato storage during the summer season, about six months. The total storage amount for last year was 1,700 tons or 57% of the total capacity. The rental charge is NRs.1.7/kg. In addition to the low utilization rate, some problems exist such as the high electricity charge for operation and maintenance of the cold storage facilities. Detailed information concerning the above is shown in Table 1-47.

The number of agro-based processing industries have been increasing over the years. At present the number of small-scale agro-based factories is 74. The number of rather large-scale agro-based industries registered in the Department of Industry is nine. Most of the factories mainly procure their raw materials from other districts (about 53% of the total amount of raw materials). Imported raw materials account for about 34% of the total amount of raw materials and those purchased in the Kathmandu Valley account for about 13%. (Details are presented in Section 1).

2.2.2 Farm Economy

Based on the data and information obtained from the Farm Survey carried out by the Agricultural Marketing Division and DADO in each district, the present annual farm budget of average sized farm households in each scheme was worked out as shown in Table 1-49.

The average holding size of farmers in the Kathmandu Valley is 0.28 ha, and 81% of farmers possess under 0.5 ha of land. Farmers who own land and self cultivate it are estimated at about 92% of the total number of farmers in the Kathmandu Valley. The average holding size of farmers in each scheme varies from 0.13 to 0.41, as shown in Table 1-49.

Owing to rapid urbanization in the Kathmandu Valley, job opportunities are also rapidly increasing. The majority of farmers in the Project Area have large amounts of non-farm income estimated at about 50 to 75% of the total amount of household income on an average. The sources of non-farm income are services or salaries from government and nongovernment jobs, business income from shops, wages from construction works, cottage industries where mainly domestic made goods are produced including bamboo baskets, rope, and mats etc., and pensions which are given to retired government employees.

Present living expenses in each scheme is varies according to farm size, family number, and location, however, annual living expenses per capita are estimated at about NRs. 5,000 as shown in Table 1-50.

2.2.3 Present Social Conditions and Farmers' Intention

All the scheme areas are located outside the metropolitan City of Kathmandu, which has a population of over 410 thousands. Recently, the population in the Kathmandu Valley is rapidly increasing, at an annual increase rate of 3.7% during 1981 - 1991, compared to 2.1% for the whole of Nepal. As mentioned in the Master Plan Report, rapid urbanization is bringing about the following drastic changes in the surrounding rural areas including the scheme areas.

- Increasing domestic water supply is starting to compete with the agricultural water supply.
- Decreasing farmland due to the use of the land for house yards and industrial lots, especially brick factories as shown in Table 1-51.
- Increasing land prices, especially land by the road side, as shown in Table 1-52.

On the other hand:

- Increasing paved road network connecting the urban areas of Kathmandu, Bhaktapur, and Lalitpur. As a result transportation will improve, non-farm jobs will be provided for rural people, market amount of agro-products and farm inputs will expand, and modern agricultural technical information and services will be disseminated.
- Increasing demand of the urban population for agro-products especially fruits and vegetables.

Although the economic circumstances are rapidly changing, the rural people in the scheme areas could not adapt so quickly. Therefore, they stick to their traditional practices to some extent, such as cereal production, using no draught animals, and measuring by traditional measurements such as Ropani, Muri, Pathi, Mana, and so on.

One of the main causes of the traditional practices is ethnic groups. The main ethnic groups in the scheme area are the Newar (56%), Chhetri (29%), and Brahmin (10%) groups, as shown in Table 1-53. The number of schemes where a majority of people are the one ethnic group is 7, such as the AK-07 Dakshinkali (Newar 65%), AK-25 Shali Nadi (Newar 91%), AB-12 Kutudhal (Newar 60%), AL-13 Lubhu (Newar 68%), AL-19 Thika Bhairaw-I (Newar 68%), AL-20 Thika Bhairaw-II (Newar 80%), and AL-10 Kotkhu (Chhetri 55%) schemes. Among these ethnic groups, Newar tends to cluster in one community. Newar farmers who own farmland outside their villages are not willing to live in other villages where most of their farmland is located. Females of the Chhetri tribe are known to be hard workers. Although labour charge of females is generally about half that of males, in the chhetri tribe labour charge of females is the same as that of males.

The farmers in the Kathmandu Valley are characterized as small scale, high labour intensive, and high fertilizer application farmers. Although most of the farmers give first priority to paddy cultivation, the above-mentioned farmers' characteristics are more suitable to high value and high labour intensive crop production such as vegetables or cash crops.

According to the results of the farm survey, productivity of vegetables is three times or more than that of paddy in terms of labour use, (net income/M.D), in the scheme area.

Most of the farmers reported that the amount of irrigation water was inadequate, which is the main limiting factor for increasing productivity and crop diversification. They will continue to grow paddy. However, they are willing to diversify by producing seasonal vegetables for commercial purposes after the completion of the Project.

Taking the above phenomenon and economic circumstances into consideration , it is expected that vegetable production will expand as early as possible in the scheme areas when a sufficient supply of water becomes available.

Tables

Table 1-1 Land Tenure in the Kathmandu Valley

Number of Household by Tenure

District	Kathmandu			Lalitpur			Bhaktapur			Total		
Year	Owned	Owned cum Tenant	Tenant	Owned	Owned cum Tenant	Tenant	Owned	Owned cum Tenant	Tenant	Owned	Owned cum Tenant	Tenant
1981/82	30,505	4,781	2,054	17,674	1,636	601	8,259	7,524	3,661	56,438	13,941	6,316
(%)	(82%)	(13%)	(6%)	(89%)	(8%)	(3%)	(42%)	(39%)	(19%)	(74%)	(18%)	(8%)
	Total Household		37,340	Total Household		19,911	Total Household		19,444	Total Household		76,695
1991/92	26,926	15,202	3,413	19,159	8,473	1,319	8,083	12,636	2,009	54,168	36,311	6,741
(%)	(59%)	(33%)	(7%)	(66%)	(29%)	(5%)	(36%)	(56%)	(9%)	(56%)	(37%)	(7%)
	Total Household		45,540	Total Household		28,950	Total Household		22,724	Total Household		97,214

Source : National Sample Census of Nepal 1981/82 , 1991/1992

Cultivated Area by Tenure

District	Kathmandu				Lalitpur				Bhaktapur				Total			
Year	Owned	Owned cum Tenant (owned)	(tenant)	Tenant	Owned	Owned cum Tenant (owned)	(tenant)	Tenant	Owned	Owned cum Tenant (owned)	(tenant)	Tenant	Owned	Owned cum Tenant (owned)	(tenant)	Tenant
1981/82	19,594	2,698	1,812	1,048	13,630	947	564	155	4,248	1,875	2,093	1,123	37,472	5,520	4,469	2,326
(%)	(78%)	(11%)	(7%)	(4%)	(89%)	(6%)	(4%)	(1%)	(45%)	(20%)	(22%)	(12%)	(75%)	(11%)	(9%)	(5%)
	Total Area		25,152		Total Area		15,296		Total Area		9,339		Total owned		42,992	(86%)
													Total rented		6,795	(14%)
													Total Area		49,787	(100%)
1991/92	7,207	2,440	2,389	774	7,728	1,656	1,288	292	2,290	1,807	2,560	441	17,224	5,902	6,236	1,507
(%)	(56%)	(19%)	(19%)	(6%)	(70%)	(15%)	(12%)	(3%)	(32%)	(25%)	(36%)	(6%)	(56%)	(19%)	(20%)	(5%)
	Total Area		12,809		Total Area		10,964		Total Area		7,096		Total owned		23,126	(75%)
													Total rented		7,743	(25%)
													Total Area		30,869	(100%)

Source : National Sample Census of Nepal 1981/82 , 1991/1992

Number of Household by Tenure Forms

District	Kathmandu		Lalitpur		Bhaktapur		Total	
Tenure Forms	one tenure	more than one tenure	one tenure	more than one tenure	one tenure	more than one tenure	Total	(%)
Total	3,382	14,364	1,252	8,406	1,961	12,414	41,779	
Fixed amount of money	161	708	291	804	16	206	2,186	(5%)
Fixed quantity of produce	3,220	13,623	805	6,975	1,946	12,177	38,746	(93%)
Share of produce	64	193	89	605	0	190	1,141	(3%)
Exchange for service	32	0	112	112	0	16	272	(1%)
Mortgage	0	96	0	45	0	0	141	(0%)
others	0	0	0	157	0	16	173	(0%)

Source : National Sample Census of Agriculture 1991/1992

Table 1-2 Planted Area , Production, and Yield of Major Crops in the Study Area

Crops	Nepal (1991/92)			Kathmandu Valley (1991/92)			The Study Area		
	Planted Area (ha)	Production (ton)	Yield (ton/ha)	Planted Area (ha)	Production (ton)	Yield (ton/ha)	**Planted Area (ha)**	**Production (ton)**	**Yield (ton/ha)**
Paddy	1,411,810	3,222,540	2.28	18,550	83,130	4.48	**5,900**	**28,000**	**4.74**
Wheat	571,260	779,160	1.36	16,480	27,410	1.66	**5,300**	**9,000**	**1.69**
Maize	754,090	1,204,710	1.60	11,890	30,090	2.53	**3,800**	**7,900**	**2.08**
*other cereals**	228,080	256,300	1.12	2,380	3,570	1.50	**850**	**1,100**	**1.29**
Potatoes	85,300	732,860	8.59	2,040	21,000	10.29	**650**	**7,200**	**11.12**
Mustard	154,570	87,840	0.57	550	320	0.58	**200**	**130**	**0.65**
Legumes	261,860	154,540	0.59	510	310	0.61	**350**	**200**	**0.57** **
*Vegetables****	142,500	1,127,836	7.91	3,519	34,242	9.73	**450**	**4,450**	**9.88**
						Total Planted Area :	**17,500**		

Remarks * : Including the Millet Barley etc.
** : Including such legumes as Black gram, Horse gram, Soybean etc.
*** : Including follow vegetables and spices:
Cauliflower, Radish, Cabbage, Broadleaf mustard, Tomato, Brinjal, Gourd, Sweet chilli, Cucumber, etc., and Ginger, Turmeric, Chilli, Garlic, etc.

Source : Agricultural Statistics in Nepal 1991/92
Sample Farm Survey by JICA Study Team 1993
Data from Each DADO office Horticulture Section

Table 1-3 Agricultural Implements and Other Facilities

	Kathmandu District		Lalitpur District		Bhaktapur District		Total 3 Districts				The Study Area					Bhaktapur I
	No.	Owner	No.	Owner	No.	Owner	No.	Owner	(%)*	No. / Owner	No.	Owner	(%)*	No. / Owner	No. / ha	Remarks
Tractor	1,449	1,353	222	177	1,503	1,472	3,174	3,002	3.09	1.06	836	781	2.18	1.07	0.09	
Power Tillers	805	740	-	-	4,050	4,049	4,855	4,789	4.93	1.00	1,397	1,389	3.87	1.01	0.15	
Animal Drawn Cart			-	-	-	-	-	-		-	-	-		-	-	
Iron Ploughs			2,325	2,279	6,848	1,455	9,173	3,734	3.84	2.50	3,838	2,092	5.83	1.83	0.40	
Sprayer	5,635	5,571	335	289	412	412	6,382	6,272	6.45	1.02	1,144	1,103	3.07	1.04	0.12	
Thresher	19,001	18,938	10,080	10,038	12,337	12,146	41,418	41,122	42.30	1.01	13,735	13,636	38.00	1.01	1.44	
Shallow Tubewell	96	96	-	-	-	-	96	96	0.10	1.00	13	13	0.04	1.00	-	
Deep Tubewells	32	32	-	-	-	-	32	32	0.03	1.00	4	4	0.01	1.00	-	
Rower Pump	354	355	45	45	143	143	542	543	0.56	1.00	126	126	0.35	1.00	0.01	
Pump-set	1,449	1,450	112	89	1,470	1,471	3,031	3,010	3.10	1.01	746	730	2.03	1.02	0.08	
others	3,962	1,674	67	67	16	16	4,045	1,757	1.81	2.30	597	283	0.79	2.11	0.06	

Remarks * : Distribution of total farm household.
Source : National Sample Census of Agriculture 1991/1992

Table 1-4 Post-harvest Practices in the Study Area

Crops	Harvesting		Heat treatment/Drying		Transportation		Threshing/Shelling		Grain Drying		Storage		Milling		Total Transport
	Tools	Loss (%)	Source	Loss (%)	Facilities	Loss (%)	Equipment	Loss (%)	Source	Loss (%)	Facilities	Loss (%)	Facilities	Loss (%)	(%)
Paddy	Sickle	1.63	Sunlight (generally not drying)	-	Manual	0.52	Pedal thrasher (Some farmer doing traditional way that beating the cut plants directly on the floor / stones / planks)	2.19	Sunlight	1.57	Bamboo bin (Bhakari) Metal / drum bin Storage structure (Dhukuti) Mud bins (Ghyampo)	6.31	small rice mill (some farmer use traditional equipment ; Okhal, Dhiki)	4.40	16.62
Wheat	Sickle	2.21	Sunlight	-	Manual	1.22	Thrasher (Some farmer doing traditional way that beating the cut plants directly on the floor / stones / planks)	3.07	Sunlight	2.07	Bamboo bin (Bhakari) Metal / drum bin Storage structure (Dhukuti) Mud bins (Ghyampo)	7.76	Janto Ghatta (water mill) (few farmer has small plate mill)	2.00	18.33
Maize	manual	3.33	Sunlight	-	Manual	1.04	Manual	2.85	Sunlight	2.50	Bamboo bin (Bhakari) Metal / drum bin Storage structure (Dhukuti) Mud bins (Ghyampo) Thungilo (hanging the maize)	7.44	Ghatta	2.30	19.46

Source : National Semin National Seminar on "Issues and Constraints related to Post-Harvest Food Losses Management " - Proceedings- , Rural Save Grain Project (HMG/FAO) , 1992
Results of Field Results of Field Interview Survey

Table 1-5 Present Farming Practices of Vegetable in the Study Area

Name of Vegetables	Planted Area*	Variety Name	(Season)	Cropping Calendar (Planting - Harvesting)	Seed Rate (kg/ha)	Spacing (cm) Row	Plant	Irrigation (time)	Compost Used (ton/ha)	Chemical fertilizer (kg Agro- Complex	Urea	Potash	Chemical	Weeding (time)	Yield (ton / ha)
Winter Vegetables	1,387			1 2 3 4 5 6 7 8 9 10 11 12											
Cauliflower	430	Kathmandu Local	Middle		0.6 - 1.0	60	45	2	7.5 - 24.0	350-500	200	0	Nuvan	2 - 3	20 - 30
		Snowball - 16	Late							N:P:K = 180:120:0					
		Deepali	Early												
Radish	316	40 days	Early		9.0 - 12.0	30-45	10-30	2	10.0 - 16.0	400-450	100	0		1	10
		Mino early	Early - Mid.							N:P:K = 130:85:0					
		White neck	Mid.- Late												
		Pyutane red													
Cabbage	302	Golden Acre			0.3 - 0.6	60	45	2 - 6	7.5 - 16.0	400-500	250	0	Nuvan	2 - 3	24 - 40
		Green Cross								N:P:K = 200:90:0			Dithane-45		
		K.K.Cross													
		Late Large Drum Head													
		Green Crownet													
		Red Cabbage													
				Round the Year (harvest after 4 months of sowing)											
Broadleaf Mustard	162	Khumal Broad Leaf			0.6 - 0.8	45	35	2	5.0 - 12.0	300-350	200	0			
		Marpha Broad Leaf		Round the Year (harvest after 1 months of sowing)						N:P:K = 125:65:0					
Onion	111	Red Creol			8.0 - 10.0	15	10	2 - 3	20	300	0	65	Malathion	1 - 2	20
		Local (Chinese Leaf Onion)								N:P:K = 60:60:40					
Garden Pea	88	New Line Perfection	middle		40	12	2-3	1	10	200	200	100	Malathion	1 - 2	4 - 8
		Arkel	very early							N:P:K = 40:40:60					
Garden Cress	82	Kathmandu Local			10	30	2-3	3 - 4	8 - 12	300	200	0		2 - 3	6 - 10
										N:P:K = 150:60:0					
Spinach	81	(Local variety)			1	Broadcasting		3	12	500	0	0		2	10 - 20
										N:P:K = 100:100:0					
Turnip	78	Purple Top White Globe			4	30	20	2	16	400-450	100	0		2	10
										N:P:K = 130:85:0					
Carrot	53	New kuroda			8	10	8	6	8	300	0	0	Nuvan	2	12
				Round the Year (harvest after 2 months of sowing)						N:P:K = 60:60:0					
Summer Vegetables	421														
French Beans	149	Kentucky Wonder	middle		20 - 25	75	45	2	5	300	250	0		1	4 - 6 (pod)
										N:P:K = 175:60:0					
Brinjal	79	Pusa Purple Long	middle		1	60	60	2 - 4	10	100	400	0	Nuvan	2 - 3	16
										N:P:K = 200:20:0					
Sweet pepper	69	California Wonder	middle		1	60	45	2 - 4	6	300	100	0		2	10
										N:P:K = 100:60:0					
Tomato	53	Roma	early-mid.		0.5 - 0.6	60-75	50	2 - 4	7 - 10	300-350	150-200		Dithane-45	3	20
		Monprecos	spring							N:P:K = 130-160:60-70:0					
		Pusa Ruby	middle												
Cucumber	36	Local			2	120	45	2	6 - 10	200	100	0		0	12
										N:P:K = 85:40:0					
Lady's Finger	31	Local			15	60	15	2	6	200	100	0		0	15
										N:P:K = 85:40:0					
Pumpkin	4	Sugani			20 - 25	75	45	2	6	200	150	0		0	10
										N:P:K = 110:40:0					
Spices	660														
Garlic	246	Local			400 - 600	15	2.5 - 5	2 - 4	20	400-500	200	0	Metacid	2 - 4	30
										N:P:K = 170-190:80-100:0			Nuvan		
Chilli	188	Kathmandu Local			1.5	60	15	4	6 - 8	300	150	0	Dithane-45	2 - 3	5
										N:P:K = 130:60:0					
Ginger	136	Bose, Nase			1,600 (rhizomes)	25-45	15-20	1 - 2	20 - 30	200	45	0		2	7 - 10
										N:P:K = 60:40:0					
Turmeric	90				1,600 (rhizomes)	30-50	50	1 - 2	20 - 30	400	400	0			
										N:P:K = 80:80:0					
Total	2,468														

Remarks *) : Planted Area in 1990/91, unpublished data of horticulture section of each DADO

Table 1-6 Livestock Population in the Study Area

Livestocks	Nepal		CDR		Kathmandu Valley		The Study Area				
	Total Head	Average No. per Farm Household	Total Head	Average No. per Farm Household	Total Head	Average No. per Farm Household	Total Head	Average No. per Farm Household	No.of holding	(%)*	Ave. Nos. /holding
Cattle	6,245,682	8.3	1,470,824	7.5	81,942	0.8	26,820	0.7	26,820	41.1	1.8
Buffallo	3,058,341	4.1	775,987	4.0	31,706	0.3	11,950	0.3	11,950	16.8	2.0
Sheep	912,372	1.2	109,092	0.6	14,864	0.2	4,740	0.1	4,740	5.1	2.6
Goat	5,405,793	7.2	1,666,219	8.5	104,992	1.1	40,090	1.1	40,090	34.2	3.3
Pig	598,955	0.8	81,220	0.4	3,431	0.0	1,460	0.0	1,460	1.1	3.9
Poultry	13,496,245	17.9	5,517,166	28.3	1,096,171	11.3	291,270	8.1	291,270	34.2	23.8
Duck	389,542	0.5	125,566	0.6	9,994	0.1	3,790	0.1		1.6	6.4

Remarks * : Proportion of livestock holdings to tatal farmhousehold
Source : Agricultural Statistics 1991/1992
National Sample Census of Agriculture , 1991/1992

Table 1-7 Livestock Production in the Study Area

Description		Nepal		CDR		Kathmandu Valley		The Study Area	
Milk Production (unit : Mt)									
No. of Milk Cow	(% of total head)	695,130	(11.1)	161,641	(11.0)	15,804	(19.3)	5,834	(21.8)
No. of Milk Buffalo	(% of total head)	751,920	(24.6)	186,522	(24.0)	18,213	(57.4)	6,723	(56.3)
Cow Milk		259,230		74,353		10,975		4,051	
Buffalo Milk		612,004		174,146		18,567		6,854	
Milk Total		871,234		248,499		29,542		10,905	
Meat Production (unit : Mt)									
Buffallo		96,013		34,160		8,056		2,974	
Mutton		3,044		369		89		33	
Goat		29,844		7,626		1,530		565	
Pig		10,407		1,523		455		168	
Chicken		9,119		4,250		1,986		733	
Duck		268		86		4		1	
Total		148,695		48,014		12,120		4,474	
Egg Production (unit : '000' Nos)									
No. of Hen	(% of total head)	4,187,282	(31.0)	1,780,224	(32.3)	529,467	(48.3)	195,438	(67.1)
No. of Duck	(% of total head)	202,352	(51.9)	66,107	(52.6)	3,766	(37.7)	1,390	(36.7)
Hen Egg		352,983		166,003		62,600		23,107	
Duck Egg		15,181		5,008		280		103	
Egg Total		368,164		171,011		62,880		23,210	
Wool Production (unit : kg)									
No. of Sheep		912,372		109,092		14,864		5,487	
Wool Production		620,413		74,183		13,997		5,167	

Source : Agricultural Statistics 1991/1992
National Sample Census of Agriculture , 1991/1992

Table 1-8 Pond Area, Water Surface, and Production Amount of the Fish Culture

		Nepal				Central Development Region (CDR)				Kathmandu Valley			
		Total	Terai	Hill	Mountain	**Total**	Terai	Hill	Mountain	**Total**	Kathmandu	Lalitpur	Bhaktapur
Area Condition													
No. of Pond	(No)	**16,562**	15,691	858	13	**6,045**	5,732	300	13	**135**	77	57	1
Area of Pond	(ha)	**8,381**	8,230	149	2	**4,040.80**	3,967.37	71.62	1.81	**35.07**	15.70	17.69	1.68
Area of Water Surface	(ha)	**4,746**	4,630	115	1	**2,054.72**	1,998.77	54.82	1.13	**25.01**	13.17	10.47	1.37
distribution (%)			(97.56)	(2.42)	(0.02)		(97.28)	(2.67)	(0.05)	(45.6% of hill area in CDR)			
(Area of Paddy cum Fish Culture)	(ha)									**7.00**	2.00	3.00	2.00
Production Amount													
Fish Production	(ton)	**9,125.0**	8,922.0	202.0	1.0	**3,842.8**	3,753.0	88.3	1.5	**33.2**	21.0	9.2	3.0
distribution (%)			(97.78)	(2.21)	(0.01)		(97.66)	(2.30)	(0.04)	(37.6% of total production of CDR hill area)			
Yield	(ton/ha)	**1.92**	1.93	1.76	1.00	**1.87**	1.88	1.61	1.33	**1.33**	1.59	0.88	2.19

Source : Unpublished Agricultural Statistics Data, MoA, 1991/92

Table 1-9 Annual Farm Budget of Average Size Farm Households

Holding Land	:	0.282 ha	Cropping Intensi :	172
Family Member	:	6		
Workable Member	:	3.5		
Main Crops	:	Paddy, Wheat, Maize, Potato and Vegetables		
Livestock	:	Cattle 2, Buffalo 1, Goats 3, Poultry 30		

	NRs.	Proportion
Gross Farm Income	11,482	
Production Cost	3,367	
Net Farm Income	8,115	23.0%
Other Farm Income (Livestock)	1,136	3.2%
Non Farm Income	26,084	73.8%
Total Household Income	35,335	100.0%
Living Expenses		
Food	19,924	57.3%
Clothing	3,865	11.1%
Housing	6,657	19.2%
Medicine	1,543	4.4%
Education	1,492	4.3%
Transport	297	0.9%
Social Expenses	969	2.8%
Sub- Total	34,747	100.0%
Saving/Reserve	588	

Table 1-10 Agricultural Reserch Center in Nepal

Name of Station				
Regional Research Station				
Eastern			Tarhara	
Central			Parawanipur	
Western			Bhairahawa	
Mid-western & Far-western			Nepalganj	
Agricultural Research Station				
Eastern	***Central***		***Western***	***Mid-western & Far-western***
Pakharibas	Rampur		Lumle	Surket
Dhankuta	Kavre		Pokhara	Jumula
	Jiri		Bandipur	Doti
	Rasuwa		Marpha	
	Trisuli		Pokhara	
	Godawari			

Table 1-11 Number of Extension Workers

Item	Lalitpur	Bhaktapur	Kathmandu	Total
Agricultural Service Center	6	6	7	19
Agricultural Service Sub-Center	11	-	7	18
Nos. of villages covered by a Center	7.0	3.6	9.6	6.8
Cultivated Area covered by a Center (ha)	1,937	1,074	897	3,908
Nos. of Extension Worker	52	31	60	143
Assistant Agri.. Development officer	8	-	-	8
Junior Technician	13	6	29	48
Junior Technical Assistant	31	25	31	87
Nos. of Village per worker	0.8	0.7	2	0.9
Nos. of Farm Families per worker	557	733	759	680
Average covering area per worker (ha)	190	208	226	209

Table 1-12 Activities of Extension Services in 1991/92

Item	Lalitpur	Bhaktapur	Kathmandu	Total
Number of Farmers Group	122	45	179	346
Member of Farmers Group	2,076	900	1,960	4,936
Number of 4-H Club	10	18	9	37
Member of 4-H Club	156	245	153	554
Training Course for Farmers				
1) Field Level				
Annual Training Courses	12	40	27	79
Attended farmers	500	800	400	1,700
2) District Level				
Annual Training Courses	16	7	3	26
Horticulture	4	3	-	7
Cereal Crops	12	4	3	19
Attended Farmers	340	175	75	590
3) Regional Level				
Dispatched Number of farmers	49	36	30	115

Table 1-13 Chemical Fertilizer Supplied by AIC

Chemical Fertilizer Supply by AIC (Unit : ton) *Comparison of Average Supply Amount*

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	Average Supply per Cultivated Area (kg/ha) in 1991/92
Urea ***(46:0:0)***													
Nepal	23,554	26,693	32,201	43,658	46,476	44,461	50,069	63,270	60,032	70,861	81,000	92,674	34.93
Central Development Region	18,519	20,772	23,998	31,445	33,925	31,868	33,693	41,185	36,718	45,045	47,404	56,056	
Kathmandu Valley	7,926	9,393	10,154	10,954	9,001	8,816	8,317	9,868	10,145	8,879	9,845	10,456	338.70
Complex ***(20:20:0)***													
Nepal	23,710	19,892	33,747	32,490	49,611	54,094	45,544	29,959	54,545	72,352	59,130	63,023	23.75
Central Development Region	16,201	12,275	18,978	18,559	26,745	20,928	26,002	15,134	27,457	37,231	32,526	33,754	
Kathmandu Valley	7,678	4,025	6,043	6,915	5,657	5,261	6,237	3,169	3,995	4,979	8,762	6,257	202.70
Potash ***(0:0:60)***													
Nepal	654	995	1,537	1,214	916	1,095	350	1,430	2,042	1,572	1,461	2,071	0.78
Central Development Region	211	346	546	299	187	347	99	355	483	503	534	705	
Kathmandu Valley	30	15	11	18	32	8	3	19	21	19	21	34	1.09
T.S.P. ***(0:46:0)***													
Nepal	61	201	32	2,253	1,398	488	6,150	10,701	8,868	3,241	12,681	2,268	0.85
Central Development Region	26	14	8	1,068	686	150	2,338	4,556	2,682	823	4,336	760	
Kathmandu Valley	5	17	5	17	6	11	137	652	121	13	29	9	0.29
DAP ***(18:46:0)***													
Nepal	0	1,329	488	1,529	65	0	0	9,340	725	65	760	18,481	6.97
Central Development Region	0	816	192	1,162	13	0	0	5,579	116	25	166	7,685	
Kathmandu Valley	0	294	96	24	0	0	0	1,032	8	0	0	83	2.70
Amm. Sulphate ***(21:0:0)***													
Nepal	4,079	5,217	3,559	4,877	1,637	2,036	3,616	6,360	5,722	6,555	6,948	3,632	1.37
Central Development Region	3,675	4,721	2,990	4,300	1,394	1,690	3,180	5,802	4,951	5,916	6,290	3,211	
Kathmandu Valley	2,343	3,021	1,602	2,741	616	887	1,384	2,797	1,973	2,482	2,765	1,858	60.18
others													
Nepal	1,942	2,132	2,216	900	18	22	15	165	20	3,975	6,657	3,647	1.37
Central Development Region	685	845	913	429	1	2	0	0	0	2,553	4,317	2,129	
Kathmandu Valley	111	37	2	38	0	1	0	0	0	311	0	1,984	64.27
													Average Supply Amount in Nutrient Contents N : P : K (kg/ha)
Total Amount													
Nepal	54,000	56,459	73,780	86,921	100,121	102,196	105,744	121,225	131,954	158,621	168,636	185,796	70.02 22.36 8.35 0.47
(growth rate)		(4.55)	(30.68)	(17.81)	(15.19)	(2.07)	(3.47)	(14.64)	(8.85)	(20.21)	(6.31)	(10.18)	
Central Development Region	39,318	39,788	47,624	57,262	62,951	54,985	65,312	72,610	72,407	92,096	95,572	104,300	
(growth rate)		(1.20)	(19.69)	(20.24)	(9.94)	(-12.65)	(18.78)	(11.17)	(-0.28)	(27.19)	(3.77)	(9.13)	
Kathmandu Valley	18,093	16,802	17,912	20,706	15,312	14,984	16,077	17,538	16,263	16,683	21,422	20,681	669.94 209.47 41.92 0.66
(growth rate)		(-7.14)	(6.61)	(15.60)	(-26.05)	(-2.14)	(7.29)	(9.09)	(-7.27)	(2.58)	(28.41)	(-3.46)	

Source : Agricultural Input Corporation

Table 1-14 Estimation of Chemical Fertilizer Consumption in the Study Area

Cultivated Area	Area (ha)
1 Paddy	5,900
2 Wheat	5,300
3 Maize	3,800
4 other cereals	850
5 Potatoes	650
6 Mustard	200
7 Legumes	350
8 Spices	80
9 Vegetables	370
Total	**17,500**

Distributed Amount of Fertilizer *	(ton)
1 Urea (46:0:0)	3,450
2 Complex (20:20:0)	2,065
3 Murate of Potash (0:0:60)	11
4 T.S.P (0:48:0)	3
5 D.A.P (18:46:0)	27
6 Anmonium Sulphate (21:0:0)	613

Estimation of Average Unit Supply	(kg/ha)
1 Urea (46:0:0)	197
2 Complex (20:20:0)	118
3 Murate of Potash (0:0:60)	1
4 T.S.P (0:48:0)	0
5 D.A.P (18:46:0)	2
6 Anmonium Sulphate (21:0:0)	35

Remark * : Estimate from total supply to Kathmandu Valley

Table 1-15 Comparison of the Actual Dosage and Recommendation in the Study Area

(Unit : kg/ha)

Average Amount of Fertilizers Supplyied by AIC

	Nutrients content (N : P : K)	Consumption Total	(N	P	K)
1 Urea	(46 : 0 : 0)	197	91	0	0
2 Complex	(20 : 20 : 0)	118	24	24	0
3 Murate of Potash	(0 : 0 : 60)	1	0	0	1
4 T.S.P	(0 : 48 : 0)	0	0	0	0
5 D.A.P	(18 : 46 : 0)	2	0	1	0
6 Anmonium Sulphate	(21 : 0 : 0)	35	7	0	0
Total			**122**	**25**	**1**

Actual Dosage and Recommendation to Major Crop

	Actual Dosage * (N : P : K)			Recommendation** (N : P : K)		
1 Paddy	146	20	0	100	30	30
2 Wheat	127	13	0	80	40	20
3 Maize	106	11	0	120	75	50
4 Potatoes	240	39	0	150	60	350
5 Mustard	86	40	0	34	22	28
6 Vegetables***	117	69	0	100	60	50

Remarks * : Farm Survey by JICA Study Team , 1993
** : Source : Trainer's manual, Manpower Development Agriculture Project, DoA.
*** : Average of cauliflower, tomato, and radish.

Table 1-16 Seed Distribution of the Major Crops by AIC

(Unit : ton)

Crop / Variety	1984/85			1985/86			1986/87			1987/88			1988/89			1989/90			1990/91			1991/92		
	Nepal	CDR	KTM Valley	Nepal	CDR	KTM Valley	Nepal	CDR	KTM Valley	Nepal	CDR	KTM Valley	Nepal	CDR	KTM Valley	Nepal	CDR	KTM Valley	Nepal	CDR	KTM Valley	Nepal	CDR	KTM Valley
1. Paddy																								
Chainung 242	5.49	2.59	2.59	3.56	2.88	2.88	3.03	2.90	2.90	10.95	6.05	6.05	2.04	1.78	1.78	3.74	3.15	3.15	3.24	2.63	2.63	0.54	0.27	0.27
Masuli	151.06	92.68	2.03	93.94	35.68	0.56	49.03	21.77	2.22	102.32	41.67	1.19	108.29	43.61	3.99	75.76	26.58	2.14	60.28	19.97	0.00	110.72	36.56	0.56
Khumal 3	2.71	1.65	1.65	2.45	0.47	0.47	1.69	0.28	0.28	1.69	0.00	0.00	3.01	1.95	1.95	3.12	0.00	0.00	0.42	0.06	0.06	0.03	0.03	0.03
Kanchan	2.07	0.94	0.94	2.67	0.22	0.17	2.61	0.66	0.66	1.47	0.00	0.00	4.19	0.63	0.43	1.57	0.04	0.04	0.00	0.00	2.87	0.00	0.00	0.00
Taichung 176	3.68	0.39	0.39	4.51	4.06	3.94	3.99	3.80	3.80	2.30	1.65	1.65	0.00	0.00	0.00	2.00	1.93	1.93	3.15	2.87	0.00	3.98	3.54	3.54
CH 45	1.37	1.05	0.04	2.56	1.26	0.00	0.55	0.05	0.00	1.90	0.77	0.00	8.96	2.61	0.00	2.10	0.77	0.00	4.64	0.28	0.00	11.76	0.00	0.00
Himali	1.08	0.39	0.00	1.68	0.86	0.81	3.00	0.33	0.33	2.88	0.42	0.30	4.19	0.13	0.10	0.65	0.06	0.06	0.60	0.00	0.29	0.33	0.00	0.00
Khumal 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.46	2.24	2.24	2.98	2.53	2.53	1.04	0.15	0.15	0.67	0.29	0.10	4.46	3.79	3.28
Khumal 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.10	0.10	0.50	0.30	0.30	0.64	0.31	0.21	0.10	0.10	0.00	0.51	0.46	0.46
Bindeswori	17.41	5.66	0.00	14.23	3.00	0.00	12.76	4.08	0.00	16.97	6.52	0.00	27.75	9.15	1.02	7.87	1.68	0.21	14.17	1.58	0.00	39.15	1.97	0.00
others	155.06	17.14	0.00	77.73	29.78	0.00	41.55	10.41	0.00	77.21	24.90	0.00	105.14	19.38	0.00	43.46	14.02	0.00	69.85	21.90	0.00	103.95	23.09	0.00
Total	339.92	122.49	7.64	203.32	78.19	8.82	118.19	44.27	10.18	220.70	84.31	11.53	267.04	82.05	12.08	141.95	48.68	7.87	157.10	49.66	5.94	275.44	69.71	8.14
2. Wheat																								
RR 21	389.09	50.27	37.03	702.09	156.83	43.90	890.48	141.27	23.68	450.70	92.33	22.92	364.08	76.52	16.01	833.14	180.83	36.94	575.77	85.79	37.79	585.84	45.79	6.45
UP 262	1,451.51	330.68	4.09	1,355.58	372.99	1.45	1,173.68	299.93	8.16	1,053.12	402.92	1.96	776.86	259.29	11.01	794.55	301.57	0.00	1088.13	340.98	3.00	703.84	215.52	0.46
Triveni	51.23	0.55	0.48	62.50	1.73	1.01	40.43	8.78	0.60	58.93	15.47	0.00	76.49	12.52	0.00	49.19	19.59	0.00	80.13	35.80	3.92	59.77	19.12	0.00
Lerma 64	0.05	0.05	0.05	0.80	0.80	0.80	0.42	0.02	0.02	0.03	0.00	0.00	0.00	0.00	0.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lerma 52	3.36	0.00	0.00	0.74	0.26	0.26	3.11	0.02	0.02	0.48	0.00	0.00	1.63	0.94	0.94	0.49	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Improved	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	530.57	7.00	7.00	195.57	61.03	4.18	0.24	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
others	23.54	0.63		130.62	27.35	0.00	112.44	29.84	0.00	177.59	30.77	0.00	265.26	67.49	0.00	348.92	93.32	57.44	330.26	171.12	117.75	582.45	194.60	35.97 *
Total	1,918.78	382.19	41.65	2,252.33	559.97	47.42	2,220.56	479.86	32.48	2,271.42	548.49	31.88	1,679.89	477.78	32.15	2,027.88	595.35	94.43	2,074.28	633.68	162.47	1,931.90	475.02	42.87
3. Maize																								
Khumal/Y	52.85	18.95	8.09	27.94	5.95	2.83	40.89	8.98	2.36	46.76	22.99	1.97	43.92	21.57	8.49	14.66	1.38	0.03	12.27	2.97	2.47	12.01	6.55	2.76
Rampur/C	22.22	9.69	0.20	25.05	13.60	1.15	14.01	10.41	0.03	19.05	10.55	1.07	34.28	21.47	0.40	32.27	12.17	2.33	17.23	6.63	3.57	32.39	12.50	6.00
Arun	8.57	2.02	0.00	18.45	10.98	0.64	16.85	13.61	0.52	31.24	13.40	0.99	40.70	10.99	1.04	33.92	19.97	1.07	10.68	3.84	0.00	14.75	4.83	0.80
Kakani/Y	2.22	2.22	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rampur/Y	6.54	0.00	0.00	1.30	0.02	0.00	0.08	0.00	0.00	1.34	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manakamana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.00	0.00	6.12	0.23	0.12	6.54	2.46	0.69	2.08	0.72	0.01	5.69	0.72	0.00
others	6.23	3.20	0.00	0.83	0.50	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.16	0.15	0.00	1.17	1.13	0.68	3.15	3.04	0.00
Total	98.62	36.08	10.50	73.57	31.05	4.62	71.87	33.00	2.90	100.21	47.05	4.03	125.05	54.26	10.05	87.55	36.13	4.11	43.42	15.29	6.73	67.99	27.64	9.56

Source: Cereal Seed Transactions of Agriculture Input Corporation (1984/85 - 1988/89) , 1990 , AIC
Unpublished Data of AIC, (1989/90 - 1991/92)

Remarks: * including NL297(35.79 ton), Annapurna-1(0.05ton), Annapurna-2(0.14ton)

Table 1-17 Pesticide Consumption by AIC

Type	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
Nepal											
dust (ton)	321	430	459	521	533	393	629	633	652	429	391
liquid (liter)	5,245	10,699	5,315	6,591	4,859	4,572	8,008	7,527	4,886	3,945	3,236
Central Development Region											
dust (ton)	167	250	258	269	277	195	272	268	227	191	159
liquid (liter)	1,771	6,957	1,879	2,679	1,634	947	1,864	1,310	1,017	600	687
Kathmandu Valley											
dust (ton)	22	16	6	7	5	4	8	16	11	13	11
liquid (liter)	238	374	81	90	31	9	269	106	71	12	23

Source : Unpublished data , Agriculture Input Corporation (AIC)

Table 1-18 Agricultural Credit and Condition

Unit : NRs.1,000 (%)

	1988/89		1989/90		1990/91		1991/92	
1. Disbursement								
a. Agri. production	3,112	(7.6%)	4,664	(8.0%)	3,973	(7.2%)	4,131	(5.0%)
b. Agri. tools & irrigation	796	(1.9%)	1,630	(2.8%)	1,336	(2.4%)	3,783	(4.6%)
c. Agri. business	13,271	(32.4%)	29,791	(51.2%)	23,408	(42.3%)	21,864	(26.3%)
d. Agri. industry & marketing	22,098	(54.0%)	19,601	(33.7%)	25,295	(45.7%)	52,669	(63.4%)
e. Bio-gass plant	581	(1.4%)	1,149	(2.0%)	222	(0.4%)	119	(0.1%)
f. Horticulture	126	(0.3%)	854	(1.5%)	1,142	(2.1%)	458	(0.6%)
g. Housing & land development	917	(2.2%)	474	(0.8%)	17	(0.0%)	-	-
Total	40,901	(100.0%)	58,163	(100.0%)	55,393	(100.0%)	83,024	(100.0%)
Annual Increase Rate	100.0%		42.2%		-4.8%		49.9%	
2. Repayment								
a. Agri. production	2,369	(6.5%)	3,389	(9.1%)	3,240	(7.9%)	5,694	(9.4%)
b. Agri. tools & irrigation	962	(2.6%)	1,248	(3.3%)	1,490	(3.6%)	2,255	(3.7%)
c. Agri. business	18,172	(50.0%)	16,381	(43.9%)	17,746	(43.2%)	22,146	(36.7%)
d. Agri. industry & marketing	14,563	(40.0%)	15,721	(42.1%)	18,063	(44.0%)	28,998	(48.1%)
e. Bio-gass plant	256	(0.7%)	438	(1.2%)	426	(1.0%)	389	(0.6%)
f. Horticulture	38	(0.1%)	125	(0.3%)	55	(0.1%)	193	(0.3%)
g. Housing & land development	15	(0.0%)	31	(0.1%)	22	(0.1%)	591	(1.0%)
Total	36,375	(100.0%)	37,333	(100.0%)	41,042	(100.0%)	60,266	(100.0%)
Annual Increase Rate	100.0%		2.6%		9.9%		46.8%	
3. Outstanding	139,624		162,630		175,779		211,055	
Total out standing index	100		116		126		151	
4. Number of borrower	-		6,070		6,068		7,952	

Sources : Agricultural Development Bank, Nepal

Table 1-19 Present Condition of the Small Farmer Development Program in the Study Area

Unit : NRs.1,000

Description	Lalitpur	Bhaktapur	Kathmandu	Total
Number of Covered Village	8	3	4	15
Disbursement Amount	3,791	846	1,248	5,885
Repayment Amount	2,442	677	1,924	5,043
Outstanding (accumulated)	11,858	3,632	4,275	19,765

Sources : Agricultural Development Bank, Nepal

Table 1-20 Estimated Annual Consumption of Vegetables by the Major Urban Population in the Study Area

Municipality	Population	Per capita Consumption *1		Total Annual Consumption	Total Annual Purchase Amount *2
		g/day	kg/yr	tons	tons
Lalitpur	117,203	227	83	9,727	10,894
Bhaktapur	61,112	241	88	5,378	6,023
Kathmandu	414,264	260	95	39,335	44,055
Total	592,579	252	92	54,440	60,972

Source *1 : Department of Agriculture Development
Note *2 : Loss and waste rate is assumed 12%.

Table 1-21 Total Annual Amount Handled by the Main Vegetable Markets

Unit : tons (%)

Market	Monthly Average	Annual Amount	Proportion of Handling Amount
Kalimati WM	2,421	29,052	46.8%
Ason	565	6,780	10.9%
Ranamukteshowar	599	7,188	11.6%
Mahaboudha/Bir Hospital	283	3,396	5.5%
Sasto Bazaar	466	5,592	9.0%
Mangal Bazaar	238	2,856	4.6%
Sukuldhoka	599	7,188	11.6%
Total	5,171	62,052	100.0%

Source : Marketing Development Division, DoAD

Table 1-22 Prices of Agriculture Inputs

Unit : NRs./Unit

Input	Unit	FY92/93 Feb.'93	FY92/93 Jan.'93	FY92/93 Nov.'92	FY91/92 July'92	FY91/92 Aug.'91	FY90/91
1. Fertilizer							
Urea (46:0:0)	Kg	5.60	5.14	5.14	5.71	5.14	4.07
Complex (20:20:0)	Kg	10.00	10.00	10.00	6.30	5.68	4.50
DAP (18:46:0)	Kg	12.50	12.50	11.00	8.36	7.52	6.32
A. Sulfate (21:0:0)	Kg	6.90	6.90	4.20	4.67	4.20	3.11
Potash (0:0:60)	Kg	8.50	8.50	6.00	3.21	2.90	2.32
TSP (0:46:0)	Kg	8.00	8.00	8.00	5.15	4.64	3.96
2. Crop Seed							
Paddy	Kg		16.70				
Wheat	Kg		12.00		12.05		9.55
Maize	Kg		14.70		14.70		11.00
3. Vegetables Seed							
Cauliflower	Kg		300.00				
Cabbage (late large)	Kg		150.00				
Cabbage (pride of India)	Kg		180.00				
Broccoli	Kg		150.00				
Cress	Kg		50.00				
Radish (ME-L)	Kg		55.00				
Radish (Tokinashi)	Kg		125.00				
Broad Leaf Mustard (MBL)	Kg		80.00				
Broad Leaf Mustard (KBL)	Kg		50.00				
Fenugreek (L)	Kg		30.00				
Fenugreek (I)	Kg		60.00				
Spinach	Kg		50.00				
Onion	Kg		25.00				
Bitter Gourd	Kg		150.00				
Cucumber	Kg		250.00				
4. Pesticide/Insecticide							
BHC Dust	Kg		6.00				
Hinosan	100 ml bottle		50.80				
Metacid	100 ml bottle		59.95				

Table 1-23 Inventory of Post-harvest Facilities

Unit : Nos.

Item	Lalitpur	Bhaktapur	Kathmandu	Total
1. Rice Mills	37	72	55	164
a. Rice only	8	34	52	94
b. Dual purpose	4	20	3	27
2. Beaten Rice Mill	4	9	2	15
3. Flour Mill	6	7	5	18
4. Spice Mill	6	5	14	25
5. Feed Mill	2	10	13	25
6. Oilseed Mill	9	4	3	16
7. Agri-based Factory	24	9	41	74

Note : Number is only registered one in Department of Industry since 1990/90 - 1992/93.
Capacity of rice mill is estimated about 500 tons per year on an average.
Source: Department of Cottage and Small Industries, Ministry of Industry.

Table 1-24 Inventory of Large-scale Agri-based Industry in the Kathmandu Valley (1992/93)

Unit : ton

Number of Company	Main Products	Amount of Products	Raw Material Total	From K. Valley	From Other Districts	Imported
1	Poultry Feeds	2,012	2,188	755	1,025	408
	Cattle Feeds	60				
2	Wheat Flour	8,200	9,700		9,700	
	Wheat Bran	2,500				
3	Biscuits	1,955	2,190	1,721	437	32
4	Butter	16				
	Milk	912	957		946	11
5	Biscuits	69	82		75	7
6	Beer	8,000	10,387	60	2	10,325
7	Instant Noodle	1,329				
8	Snacks	66	1,671	41	1,063	567
9	Cattle & Poultry Feeds	7,088	7,768	2,011	5,297	460
Total		32,207	34,943	4,588	18,545	11,810
%			100.0	13.1	53.1	33.8

Table 1-25 Fluctuations in the Average Monthly Retail Price of Vegetables in Kathmandu District (1992/93)

Crop	Highest Price (HP) NRs/kg	Month	Lowest Price (LP) NRs/kg	Month	Annual Average price NRs./kg	Ratio of HP/LP
Cauliflower	25.12	Aug./Sep.	10.63	Dec./Jan.	16.50	2.36
Cabbage	10.00	Nov./Dec.	7.00	July/Aug.	8.53	1.43
Brinjal	12.83	Sep./Oct.	7.00	July/Aug.	9.03	1.83
Green peas	35.00	Apr./May	10.33	Dec./Jan.	24.09	3.39
Radish	8.25	Apr./May	3.50	Nov./Dec.	4.68	2.36
Tomato (L)	30.00	Oct./Nov.	10.67	Dec./Jan.	15.95	2.81
Potatoes	10.25	Oct./Nov.	5.00	Dec./Jan.	7.39	2.05
Pointed Gourd	20.00	Nov./Dec.	8.88	July/Aug.	12.58	2.25
Onion	10.33	Jan./Feb.	6.40	May/June	8.27	1.61
Ginger	20.33	Sep./Oct.	16.63	Nov./Dec.	19.06	1.22

Source : Marketing Development Division, DoAD.

Table 1-26 Monthly Retail Price of Vegetables in Kathmandu District (1992/93)

Unit : NRs./kg

Vegetables	Apr./May	May/June	June/July	July/Aug.	Aug./Sep.	Sep./Oct.	Oct./Nov.	Nov./Dec.	Dec./Jan.	Jan./Feb.	Feb./Mar.	Mar./Apr.	Average
Cauliflower	16.30	14.30	18.50	17.00	25.12	23.17	15.50	11.00	10.63	13.50			16.50
Cabbage	9.17	8.30	7.00	8.50	7.50	8.83	9.83	10.00	8.00	8.17			8.53
Brinjal	8.83	9.50	7.88	7.00	7.50	12.83	10.67	10.50	7.25	8.33			9.03
Green peas	35.00	34.40	27.50				21.00	20.00	20.38	10.33			24.09
Radish	8.25	7.25	4.50	2.75	3.63	5.00	3.75	3.50	3.50	4.67			4.68
Tomato (L)	11.83	17.40	12.25	16.25	12.25	23.67	30.00	13.00	10.67	12.17			15.95
Tomato (T)	11.00	11.00	11.25			20.00	22.25	9.00	8.50				13.29
Potatoes (White)	6.67	8.50	8.00	7.50	7.50	8.00	10.25	7.00	5.00	5.50			7.39
Potatoes (Red)	7.50	9.30	9.38	9.50	9.38	9.67	11.00	8.65	6.17	6.58			8.71
Pointed Gourd	16.17	12.80	10.13	8.88	10.63	10.50	11.50	20.00					12.58
Onion	6.50	6.40	6.75	7.63	7.88	7.50	10.00	10.00	9.67	10.33			8.27
Ginger	20.00	21.75	18.75	19.00	19.67	20.33	17.38	16.63	18.75	19.25	18.50	18.75	19.06

Source : Marketing Development Division, DoAD.

Table 1-27 Prevailing Vegetable Prices in the Study Area (1992/93)

Unit: NRs./kg

Crops	Farm-gate	Wholesale	Retail	Remarks
Potatoes	6.45	7.03	8.05	
Radish	2.50	3.26	4.68	
Cauliflower	12.00	12.26	16.50	
Tomato	8.50	10.07	14.62	
Brinjal	4.00	5.82	9.03	
Beans	10.00	11.72	-	
Cabbage	5.50	5.92	8.53	
Onion	6.00	6.24	8.27	
Ginger	14.53	-	19.06	
Green chilli	9.00	20.82		
Pointed Gourd		12.03	12.58	
Carrot	6.00			
Coriander	15.00			
Cress	10.00			
Spinach	10.00			
Lettuce	10.00			

Table 1-28 Food Balance Situation Concerning Cereals

		87/88	88/89	89/90	90/91	91/92
Nepal	P	17,753	18,207	18,677	18,263 *1	18,661
	C	3,006	3,418	3,550	3,619	3,373
	N	2,726	2,921	3,559	3,487	3,562
	B	280	497	-9	132	-189
Lalitpur district	P	217	222	228	255	262
	C	24	27	26	29	29
	N	45	46	46	51	53
	B	-21	-19	-20	-22	-24
Bhaktapur district	P	189	194	199	172 *1	175 *1
	C	24	24	23	27	23
	N	23	25	40	34	35
	B	1	-1	-17	-7	-12
Kathmandu district	P	482	491	501	653	684
	C	44	48	43	46	39
	N	96	99	101	131	137
	B	-52	-51	-58	-85	-98
Kathmandu Valley	P	888	907	928	1,080	1,121
	C	92	99	92	102	91
	N	164	170	187	216	225
	B	-72	-71	-95	-114	-134

Note : P = Population midterm estimate (1,000)
C = Consumptive Production (1,000 tons)
N = Necessity of food based on calories (1,000 tons)
B = Balance (surplus or deficit; 1,000 tons)
*1 : From CBS in reduced form.
Source : Consumptive Cereals of Kingdom of Nepal 1987-1992
Agriculture Marketing Development Division, DoAD.

Table 1-29 Present Organization of Agricultural Cooperative Societies in the Kathmandu Valley

Primary ACS	Nos. of Villages Covered	Nos. of Members	Total Nos. of Household in Village covered	Systematization Rate	Financial Balance in FY1991/92 NRs.1,000
Lalitpur District	41	15,574	28,951	54%	-
D. Co-op. Union	35	15,574	21,213	73%	-359
1	4	1,464	2,055	71%	-28
2	3	2,635	2,651	99%	-69
3	6	2,503	3,950	63%	-49
4	2	2,040	2,298	89%	-5
5	2	1,169	1,970	59%	-48
6	3	1,823	2,245	81%	-95
7	5	3,303	3,286	101%	-51
8	4	534	965	55%	-
9	6	103	1,793	6%	0
Bhaktapur district	22	547	22,725	2%	-
D. Co-op. Union	21	547	16,942	3%	-781
1	3	67	2,453	3%	-81
2	2	69	1,398	5%	-60
3	2	213	1,597	13%	-98
4	2	53	1,692	3%	-151
5	3	40	2,515	2%	-33
6	2	8	1,426	1%	-118
7	2	28	1,844	2%	-68
8	3	33	2,586	1%	-129
9	2	36	1,431	3%	-41
Kathmandu district	67	23,384	45,541	51%	-
D. Co-op. Union	66	23,384	37,344	63%	N.A.
1	5	1,147	3,177	36%	-24
2	2	936	1,158	81%	-32
3	5	1,588	2,669	59%	-41
4	5	1,761	2,422	73%	-56
5	4	1,520	2,203	69%	-79
6	3	1,446	1,615	90%	-47
7	4	1,285	1,750	73%	-14
8	3	1,325	2,329	57%	56
9	4	2,576	2,725	95%	-23
10	4	1,015	2,102	48%	-38
11	6	1,998	3,169	63%	-29
12	2	1,370	1,413	97%	-42
13	4	1,025	2,039	50%	-11
14	11	2,622	5,940	44%	-43
15	4	1,770	2,633	67%	-32

Source : District Co-operative Office in Lalitpur, Bhaktapur and Kathmandu.

Table 1-30 Distribution of the Sample Population According to Age

		Below 10 years	10 to 14 years	15 to 64 years	Above 64 years	Total
The Study Area	(%)	21	12	63	4	100
Whole Nepal	(%)	29.8	12.6	54.1	3.5	100

Source : Result of Farm Survey and Statistical Year Book of Nepal, 1993.

Table 1-31 Literate Population According to the Level of Education in the Study Area

		Just Literate	Primary Education	Lower Secondary	Secondary	Higher Education	Total
Percent	(%)	20	21	15	27	17	100
Literate Population		86	90	65	116	73	430

Source : Result of Farm Survey; Total population is 665.

Table 1-32 Village Development Committee (VDC) and Wards

Scheme No./Name		Project Area (ha)	Net Farm Land (ha)	Total Farm Population	Scheme Area			
					Name of VDC	Ward Number	Gross Area (ha)	No. of Farm household
Kathmandu District								
AK - 04	Biswambhara	135	92	1,232	Suntole	8, 9	135	244
AK - 05	Boshan	194	122	2,440	Panga Balkumari	3, 6, 9	69	155
					Chobar Bhutjhel	5, 6, 7, 8, 9	125	281
AK - 07	Dakshinkali	100	67	1,412	Dakshinkali	7	100	58
						(outside resident farmers		181)
AK - 14	Indrayani	268	101	1,611	Indrayani	1, 2, 3, 4, 5, 6, 7, 9	268	273
AK - 25	Shali Nadi	257	157	3,780	Lapsephedi	1	2	5
					Bajrajogini	1, 2, 3, 4, 5, 6	58	131
					Suntole	1, 2, 3, 4, 5, 6, 7, 8	90	203
					Pukhulachi	1, 2, 3, 4, 5, 6, 7, 8, 9	107	242
	Sub - Total	954	539	10,475	8	42	954	1,753
Bhaktapur District								
AB - 02	Bidol	65	32	1,011	Sudal	1	45	29
					Tathali	9	20	13
						(outside resident farmers		126)
AB - 10	Katunje	54	40	967	Katunje	2, 3, 4, 5	54	167
AB - 12	Kutudhal	83	43	803	Bageswari	1, 2	83	82
						(outside resident farmers		61)
AB - 14	Mahadev Khola	180	112	2,585	Dadhikot	3, 5, 6, 7, 8, 9	157	376
					Balkot	8	23	55
	Sub - Total	382	227	5,366	6	15	382	909
Lalitpur District								
AL - 10	Kotkhu	466	246	6,862	Harishidhi	1, 2, 3, 4, 5, 6, 7, 8, 9	270	750
					Imadol	2, 5, 6, 7, 8, 9	193	536
					Thaiba	9	3	9
AL - 13	Lubhu	220	130	3,448	Lamatar	8	2	5
					Lubhu	1, 2, 3, 5, 6, 7, 8, 9	134	344
					Tikatali	6, 7, 8, 9	84	216
AL - 19	Thika Bhairaw-(I)	892	497	11,530	Chapagaun	1, 2, 3, 4, 6, 7, 9	225	501
					Thecho	1, 2, 3, 4, 5, 6, 7, 8, 9	272	606
					Sunakoti	1, 2, 3, 4, 5, 6, 7, 8, 9	266	593
					Dhapakhel	2, 3, 4, 5, 8	129	288
AL - 20	Thika Bhairaw-(II)	153	88	3,655	Sunakoti	1,3, 4, 5, 9	117	517
					Thecho	2, 5, 6, 9	36	160
	Sub - Total	1,731	961	25,495	10	59	1,731	4,525
	Total	3,067	1,727	41,336	24	116	3,067	7,187

Table 1 - 33 Farm Population and Family Size

(Unit : person)

Scheme No./Name		Total No. of Household	Population					Farm Household				Farm Population**	Average Family Size
			Total	Male		Female		Resident Farmer		Outside Farmer*	Total		
Kathmanu District													
AK - 04	Biswambhara	22,857	1,260	731	(58%)	529	(42%)	224	(98%)		224	1,232	5.5
AK - 05	Boshan	49,829	279,040	156,262	(56%)	122,778	(44%)	436	(88%)		436	2,440	5.6
AK - 07	Dakshinkali	5,808	41,119	19,326	(47%)	21,793	(53%)	58	(100%)	181	239	1,412	5.9
AK - 14	Indrayani	31,415	185,384	90,838	(49%)	94,546	(51%)	273	(87%)		273	1,611	5.9
AK - 25	Shali Nadi	70,000	455,000	245,700	(54%)	209,300	(46%)	581	(83%)		581	3,780	6.5
	Sub-total/(Average)	179,909	961,802	512,857	(53%)	448,945	(47%)	1,572	(87%)	181	1,753	10,475	6.0
Bhaktapur District													
AB - 02	Bidol	4,303	25,615	13,576	(53%)	12,039	(47%)	42	(98%)	126	168	1,011	6.0
AB - 10	Katunje	17,653	102,416	60,426	(59%)	41,991	(41%)	167	(95%)		167	967	5.8
AB - 12	Kutudhal	9,680	54,227	25,487	(47%)	28,740	(53%)	82	(85%)	61	143	803	5.6
AB - 14	Mahadev Khola	49,033	294,198	150,041	(51%)	144,157	(49%)	431	(88%)		431	2,585	6.0
	Sub-total/(Average)	80,670	476,456	249,529	(53%)	226,927	(48%)	722	(89%)	187	909	5,366	5.9
Lalitpur District													
AL - 10	Kotkhu	150,932	1,011,268	544,062	(54%)	467,206	(46%)	1,295	(86%)		1,295	6,862	5.3
AL - 13	Lubhu	63,412	386,803	186,826	(48%)	199,977	(52%)	565	(89%)		565	3,448	6.1
AL - 19	Thika Bhairaw-(I)	224,887	1,304,325	626,076	(48%)	678,249	(52%)	1,988	(88%)		1,988	11,530	5.8
AL - 20	Thika Bhairaw-(II)	163,527	883,001	424,723	(48%)	458,277	(52%)	677	(41%)		677	3,655	5.4
	Sub-total/(Average)	602,758	3,585,397	1,781,688	(50%)	1,803,710	(50%)	4,525	(75%)	0	4,525	25,495	5.7
	Total/(Average)	863,336	5,023,655	2,544,074	(51%)	2,479,582	(49%)	6,819	(79%)	368	7,187	41,336	5.8

Source : Farm Survey , JICA Study Team , 1994

Remarks : * Rate of outside resident farmers in each Scheme

AK-07 : 75.7%

AB-02 : 75.0%

AB-12 : 42.8%

** Farm population is included those of out side resident farmers

Table 1 - 34 Available Labour Force in the Scheme Area

(Unit : person)

Scheme No./Name		Total Farm Population	Economically Active Population*2		Economically Active Population for Agriculture*3		Available Labour Force ('000 man-days) per annum*4	per 1/2 month*5
Kathmandu District								
AK - 04	Biswambhara	1,232	986	(80.0%)	432	(43.8%)	126	5.3
AK - 05	Boshan	2,440	1,759	(72.1%)	818	(46.5%)	239	10.0
AK - 07	Dakshinkali	1,412 *1	1,027	(72.7%)	649	(63.2%)	189	7.9
AK - 14	Indrayani	1,611	1,145	(71.1%)	709	(61.9%)	207	8.6
AK - 25	Shali Nadi	3,780	2,552	(67.5%)	1,286	(50.4%)	375	15.6
	Sub-total/(Average)	10,475	7,468	(71.3%)	3,893	(52.1%)	1,137	47.4
Bhaktapur District								
AB - 02	Bidol	1,011 *1	657	(65.0%)	399	(60.7%)	116	4.9
AB - 10	Katunje	967	604	(62.5%)	327	(54.1%)	95	4.0
AB - 12	Kutudhal	803 *1	536	(66.7%)	244	(45.6%)	71	3.0
AB - 14	Mahadev Khola	2,585	1,949	(75.4%)	1,284	(65.9%)	375	15.6
	Sub-total/(Average)	5,366	3,746	(69.8%)	2,255	(60.2%)	658	27.4
Lalitpur District								
AL - 10	Kotkhu	6,862	5,147	(75.0%)	2,496	(48.5%)	729	30.4
AL - 13	Lubhu	3,448	2,317	(67.2%)	1,128	(48.7%)	329	13.7
AL - 19	Thika Bhairaw-(I)	11,530	8,106	(70.3%)	2,967	(36.6%)	866	36.1
AL - 20	Thika Bhairaw-(II)	3,655	2,639	(72.2%)	1,071	(40.6%)	313	13.0
	Sub-total/(Average)	25,495	18,208	(71.4%)	7,663	(42.1%)	2,237	93.2
	Total/(Average)	41,336	29,423	(71.2%)	13,811	(46.9%)	4,033	168.0

Remarks : *1 Farm population is included those of outside resident farmers (Ref : Table 6-2)

*2 Economically active population range : between 10 - 60 years
Estimation based on the results of Farm Survey , JICA Study Team, 1994

*3 The main occupation of these population is agriculture.
Estimation based on the results of Farm Survey , JICA Study Team, 1994

*4 292 days (80% available) is applied for yearly workable day.

*5 12 days (80% available) is applied for half monthly workable days.

Table 1 - 35 Landholding in Each Farm Size

(Unit : Farm Household (FHH))

Scheme No./Name	Marginal > 0.2 ha	Small 0.2 < 0.5 ha	Medium 0.5 < 1.0 ha	Large 1.0 ha <	Total Farm household	Average Farm Size (ha/FHH)
Kathmandu District						
AK - 04 Biswambhara	99 (44%)	103 (46%)	20 (9%)	2 (1%)	224 (100%)	0.41
AK - 05 Boshan	262 (60%)	131 (30%)	44 (10%)		436 (100%)	0.28
AK - 07 Dakshinkali	81 (34%)	120 (50%)	36 (15%)	2 (1%)	239 (100%)	0.28
AK - 14 Indrayani	177 (65%)	55 (20%)	35 (13%)	5 (2%)	273 (100%)	0.37
AK - 25 Shali Nadi	267 (46%)	215 (37%)	81 (14%)	17 (3%)	581 (100%)	0.27
Sub-total/(Average)	886 (51%)	623 (36%)	216 (12%)	28 (2%)	1,753 (100%)	0.32
Bhaktapur District						
AB - 02 Bidol	50 (30%)	66 (39%)	49 (29%)	3 (2%)	168 (100%)	0.19
AB - 10 Katunje	82 (49%)	60 (36%)	22 (13%)	3 (2%)	167 (100%)	0.24
AB - 12 Kutudhal	46 (32%)	40 (28%)	56 (39%)	1 (1%)	143 (100%)	0.30
AB - 14 Mahadev Khola	272 (63%)	108 (25%)	43 (10%)	9 (2%)	431 (100%)	0.26
Sub-total/(Average)	450 (49%)	273 (30%)	169 (19%)	17 (2%)	909 (100%)	0.25
Lalitpur District						
AL - 10 Kotkhu	570 (44%)	259 (20%)	401 (31%)	65 (5%)	1295 (100%)	0.19
AL - 13 Lubhu	215 (38%)	333 (59%)	17 (3%)		565 (100%)	0.23
AL - 19 Thika Bhairaw-(I)	1,173 (59%)	517 (26%)	258 (13%)	40 (2%)	1988 (100%)	0.25
AL - 20 Thika Bhairaw-(II)	508 (75%)	102 (15%)	54 (8%)	14 (2%)	677 (100%)	0.13
Sub-total/(Average)	2,465 (54%)	1,211 (27%)	731 (16%)	118 (3%)	4,525 (100%)	0.20
Total/(Average)	3,801 (53%)	2,107 (29%)	1,117 (16%)	162 (2%)	7,187 (100%)	0.24

Source : Farm Survey , JICA Study Team , 1994

Table 1 - 36 Present Land Tenure

(Unit : Farm Household (FHH))

Scheme No./Name		Owner Cultivator		Tenant Cultivator		Owner cum Tenant		Total Farmer	
Kathmandu District									
AK - 04	Biswanbhara	4	(2%)	25	(11%)	195	(87%)	224	(100%)
AK - 05	Boshan	196	(45%)	109	(25%)	131	(30%)	436	(100%)
AK - 07	Dakshinkali	151	(63%)	5	(2%)	84	(35%)	239	(100%)
AK - 14	Indrayani	44	(16%)	161	(59%)	68	(25%)	273	(100%)
AK - 25	Shali Nadi	139	(24%)	122	(21%)	320	(55%)	581	(100%)
	Sub-total	534	(30%)	422	(24%)	797	(45%)	1,753	(100%)
Bhaktapur District									(100%)
AB - 02	Bidol	45	(27%)	55	(33%)	67	(40%)	168	(100%)
AB - 10	Katunje	42	(25%)	42	(25%)	84	(50%)	167	(100%)
AB - 12	Kutudhal	43	(30%)	29	(20%)	72	(50%)	143	(100%)
AB - 14	Mahadev Khola	22	(5%)	345	(80%)	65	(15%)	431	(100%)
	Sub-total	152	(17%)	471	(52%)	287	(32%)	909	(100%)
Lalitpur District									
AL - 10	Kotkhu	259	(20%)	660	(51%)	376	(29%)	1,295	(100%)
AL - 13	Lubhu	305	(54%)	209	(37%)	51	(9%)	565	(100%)
AL - 19	Thika Bhairaw-(I)	1,074	(54%)	99	(5%)	815	(41%)	1,988	(100%)
AL - 20	Thika Bhairaw-(II)	406	(60%)			271	(40%)	677	(100%)
	Sub-total	2,044	(45%)	969	(21%)	1,512	(33%)	4,525	(100%)
	Total	2,730	(38%)	1,861	(26%)	2,596	(36%)	7,187	(100%)

Source : Farm Survey , JICA Study Team , 1994

Table 1 - 37 Present Plantd Area and Cropping Intensity

< Planted Area> (Unit : ha)

Sheme No./Name		Net Farm Land	Planted Area by Crops								
			Paddy	Wheat	Maize	Mustard	Potatoes	E.L. Potatoes	Bean	Pea	Total Area
Kathmandu District											
AK - 04	Biswambhara	**92.0**	82.8	68.1	9.2	9.2	11.0				**180.3**
AK - 05	Boshan	**122.0**	122.0	70.8		34.2	12.2				**239.1**
AK - 07	Dakshinkali	**67.0**	67.0	14.7		23.5	2.0			24.8	**132.0**
AK - 14	Indrayani	**101.0**	99.0	78.8	2.0	2.0	18.2				**200.0**
AK - 25	Shali Nadi	**157.0**	157.0	78.5		7.9	37.7	44.0			**325.0**
	Sub-total	**539.0**	527.8	310.9	11.2	76.7	81.1	44.0		24.8	**1,076.4**
Bhaktapur District											
AB - 02	Bidol	**32.0**	32.0	25.6			3.2				**60.8**
AB - 10	Katunje	**40.0**	38.0	29.6	2.0	2.4	6.0				**78.0**
AB - 12	Kutudhal	**43.0**	43.0	34.4		0.9	5.6				**83.9**
AB - 14	Mahadev Khola	**112.0**	109.8	89.6	2.2	5.6	5.6		3.4		**216.2**
	Sub-total	**227.0**	222.8	179.2	4.2	8.9	20.4		3.4		**438.8**
Lalitpur District											
AL - 10	Kotkhu	**246.0**	226.3	162.4	14.8	29.5	29.5				**462.5**
AL - 13	Lubhu	**130.0**	120.9	84.5	6.5	6.5	6.5		19.5		**244.4**
AL - 19	Thika Bhairaw-(I)	**497.0**	432.4	372.8	54.7	39.8	44.7		14.9		**959.2**
AL - 20	Thika Bhairaw-(II)	**88.0**	86.2	74.8		1.8	2.6		1.8		**167.2**
	Sub-total	**961.0**	865.9	694.4	75.9	77.5	83.4		36.2		**1,833.3**
	Total	**1,727.0**	1,616.4	1,184.5	91.4	163.1	184.9	44.0	39.5	24.8	**3,348.5**

< Cropping Intensity> (Unit : %)

Sheme No./Name		Cropping Intensity by Crops								
		Paddy	Wheat	Maize	Mustard	Potatoes	E.L. Potatoes	Bean	Pea	Total Area
Kathmandu District										
AK - 04	Biswambhara	90	74	10	10	12				**196**
AK - 05	Boshan	100	58		28	10				**196**
AK - 07	Dakshinkali	100	22		35	3			37	**197**
AK - 14	Indrayani	98	78	2	2	18				**198**
AK - 25	Shali Nadi	100	50		5	24	28			**207**
	Sub-Average	97.9	57.7	2.1	14.2	15.0	8.2		4.6	**199.7**
Bhaktapur District										
AB - 02	Bidol	100	80			10				**190**
AB - 10	Katunje	95	74	5	6	15				**195**
AB - 12	Kutudhal	100	80		2	13				**195**
AB - 14	Mahadev Khola	98	80	2	5	5		3		**193**
	Sub-Average	98.1	78.9	1.9	3.9	9.0		1.5		**193.3**
Lalitpur District										
AL - 10	Kotkhu	92	66	6	12	12				**188**
AL - 13	Lubhu	93	65	5	5	5		15		**188**
AL - 19	Thika Bhairaw-(I)	87	75	11	8	9		3		**193**
AL - 20	Thika Bhairaw-(II)	98	85		2	3		2		**190**
	Sub-Average	90.1	72.3	7.9	8.1	8.7		3.8		**190.8**
	Average	93.6	68.6	5.3	9.4	10.7	2.5	2.3	1.4	**193.9**

Table 1 - 38 Present Farm Inputs Use in the Scheme Area

Crops	Planted Area (ha)	Seed (kg/ha)	Fertilizer (kg / ha)						Labour (man-days)						Total
			Chemical		Compost	(Nutrient Contents)			Family			Hired			
			Complex	Urea		N : P : K			Male	Female	Total	Male	Female	Total	
Paddy	1,616	50	211	151	2,951	141	48	27	65	87	152	28	36	64	216
Wheat	1,184	139	160	133	1,926	112	36	17	41	48	89	19	16	35	124
Maize	91	23	84	87	2,674	83	22	24	43	53	96	6	12	18	114
Potatoes	229	695	207	157	5,295	167	52	48	71	116	187	16	23	39	226
Mustard	163	17	16	74	611	44	4	6	34	61	95	10	3	13	108
Broad bean	40	39	127	0	1,114	37	28	10	59	71	130	11	6	17	147
Garden pea	25	15	0	0	202	2	0	2	30	40	70	0	0	0	70

Resources : Farm Survey , JICA Study Team , 1994

Table 1 - 39 Comparison of the Actual Dosage and Recommendation

Crops	Chemical Fertilizer		Actual Dosage*			Recommendation **		
	per ha (kg / ha)	Total (ton)	N : P : K			N : P : K		
Paddy	362	585	141	48	27	100	30	30
Wheat	293	347	112	36	17	80	40	20
Maize	171	16	83	22	24	120	75	50
Potatoes	364	83	167	52	48	150	60	350
Mustard	90	15	44	4	6	34	22	28
Broad bean	127	5	37	28	10	2	2	2
Garden pea	0	0	2	0	2	2	2	2
Total		1,051						
Average per ha*** (kg)		608						

Remarks : * Farm Survey , JICA Study Team , 1994

** Sources : Trainer's manual , Manpower Development Agriculture Project , DOA

*** Average apply amount = Total apply amount (1,051 ton) / Net farm land (1,727 ha)

Table 1 - 40 Summary of the Present Labour Balance (1/2)

(Unit : 1,000 man-days)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Kathmandu District													
AK-04 Biswambhara (Farm Population : 1,232 , Economic Active Population Rate 80.0% , Agriculture Labour Rate 43.8% , Farm land area 92 ha)													
A. Labour Force Available	11	11	11	11	11	11	11	11	11	11	11	11	126
B. Total Labour Use for Farming Activities	2	2	1	2	1	3	6	2	1	2	4	3	31
C. Balance [A - B]	8	9	9	8	9	7	5	8	9	8	6	8	95
[B/A = %]	20	15	11	21	14	32	55	23	14	23	41	27	25
AK-05 Boshan (Farm Population : 2,440 , Economic Active Population Rate 72.1% , Agriculture Labour Rate 46.5% , Farm land area 122 ha)													
A. Labour Force Available	20	20	20	20	20	20	20	20	20	20	20	20	239
B. Total Labour Use for Farming Activities	3	3	2	2	1	5	8	3	2	4	6	4	42.52
C. Balance [A - B]	17	17	18	18	19	15	12	17	18	16	14	16	196
[B/A = %]	13	13	10	12	5	23	42	15	10	18	32	19	18
AK-07 Dakshinkali (Farm Population : 1,412 , Economic Active Population Rate 72.7% , Agriculture Labour Rate 63.2% , Farm land area 67 ha)													
A. Labour Force Available	16	16	16	16	16	16	16	16	16	16	16	16	189
B. Total Labour Use for Farming Activities	2	1	1	0	0	3	5	3	3	3	4	3	28
C. Balance [A - B]	14	14	15	15	16	13	11	13	13	12	12	13	161
[B/A = %]	11	9	6	3	1	16	30	17	19	21	26	17	15
AK-14 Indrayani (Farm Population : 1,611 , Economic Active Population Rate 71.1% , Agriculture Labour Rate 61.9% , Farm land area 101 ha)													
A. Labour Force Available	17	17	17	17	17	17	17	17	17	17	17	17	207
B. Total Labour Use for Farming Activities	3	2	1	3	1	4	7	3	2	3	5	3	36
C. Balance [A - B]	15	16	16	14	16	13	10	15	16	14	12	14	171
[B/A = %]	15	9	8	16	7	22	39	15	10	17	29	19	17
AK-25 Shalt Nadi (Farm Population : 3,780 , Economic Active Population Rate 67.5% , Agriculture Labour Rate 50.4% , Farm land area 157 ha)													
A. Labour Force Availabte	31	31	31	31	31	31	31	31	31	31	31	31	375
B. Total Labour Use for Farming Activities	5	5	4	5	2	6	11	4	3	5	9	5	63
C. Balance [A - B]	26	27	27	26	29	25	21	27	29	27	23	26	312
[B/A = %]	17	15	13	16	7	19	34	13	9	15	28	17	17
Sub-Total													
A. Labour Force Available	95	95	95	95	95	95	95	95	95	95	95	95	1,137
B. Total Labour Use for Farming Activities	15	12	10	13	6	20	36	15	11	17	29	18	201
C. Balance [A - B]	80	83	85	82	89	74	58	80	84	78	66	77	936
[B/A = %]	15	13	10	14	6	21	38	15	12	18	30	19	18
Bhaktapur District													
AB-02 Bidol (Farm Population : 1,011 , Economic Active Population Rate 65.0% , Agriculture Labour Rate 60.7% , Farm land area 32 ha)													
A. Labour Force Available	10	10	10	10	10	10	10	10	10	10	10	10	116
B. Total Labour Use for Farming Activities	1	0	0	1	0	1	2	1	1	1	2	1	11
C. Balance [A - B]	9	9	9	9	9	8	8	9	9	9	8	9	106
[B/A = %]	7	4	3	8	4	13	22	8	6	10	16	9	9
AB-10 Katunje (Farm Population : 967 , Economic Active Population Rate 62.5% , Agriculture Labour Rate 54.1% , Farm land area 40 ha)													
A. Labour Force Available	8	8	8	8	8	8	8	8	8	8	8	8	95
B. Total Labour Use for Farming Activities	1	1	1	1	1	1	3	1	1	1	2	1	14
C. Balance [A - B]	7	7	7	7	7	6	5	7	7	7	6	7	82
[B/A = %]	12	8	7	13	7	19	33	13	8	14	24	16	14
AB-12 Kutudhal (Farm Population : 803 , Economic Active Population Rate 66.7% , Agriculture Labour Rate 45.6% , Farm land area 43 ha)													
A. Labour Force Available	6	6	6	6	6	6	6	6	6	6	6	6	71
B. Total Labour Use for Farming Activities	1	1	0	1	1	2	3	1	1	1	2	1	15
C. Balance [A - B]	5	5	5	5	5	4	3	5	5	5	4	5	56
[B/A = %]	17	11	8	19	9	27	49	18	12	21	36	22	21
AB-14 Mahadev Khola (Farm Population : 2,585 , Economic Active Population Rate 75.4% , Agriculture Labour Rate 65.9% , Farm land area 112 ha)													
A. Labour Force Available	31	31	31	31	31	31	31	31	31	31	31	31	375
B. Total Labour Use for Farming Activities	2	2	1	3	1	4	7	3	2	3	6	3	38
C. Balance [A - B]	29	30	30	29	30	27	24	28	29	28	26	28	338
[B/A = %]	7	5	3	8	5	14	24	9	6	10	18	10	10
Sub-Total													
A. Labour Force Available	55	55	55	55	55	55	55	55	55	55	55	55	658
B. Total Labour Use for Farming Activities	5	3	2	6	3	9	15	6	4	7	11	7	77
C. Balance [A - B]	50	51	52	49	52	46	40	49	51	48	43	48	581
[B/A = %]	9	6	4	10	5	16	28	10	7	12	21	12	12

(continued)

Table 1 - 40 Summary of the Present Labour Balance (2/2)

(Unit : 1,000 man-days)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Lalitpur District													
AL-10 Kotkhu (Farm Population : 6,862 , Economic Active Population Rate 75.0% , Agriculture Labour Rate 48.5% , Farm land area 246 ha)													
A. Labour Force Available	61	61	61	61	61	61	61	61	61	61	61	61	729
B. Total Labour Use for Farming Activities	5	4	3	5	3	9	16	6	4	7	12	7	81
C. Balance [A - B]	55	57	57	55	58	52	45	55	57	54	49	54	647
[B/A = %]	9	7	5	9	5	15	26	10	7	11	19	12	11
AL-13 Lubhu (Farm Population : 3,448 , Economic Active Population Rate 67.2% , Agriculture Labour Rate 48.7% , Farm land area 130 ha)													
A. Labour Force Available	27	27	27	27	27	27	27	27	27	27	27	27	329
B. Total Labour Use for Farming Activities	2	2	2	3	2	5	8	3	2	4	7	3	43
C. Balance [A - B]	25	25	26	24	26	23	19	24	25	24	21	24	287
[B/A = %]	8	7	6	11	6	17	30	12	8	14	24	12	13
AL-19 Thika Bhairaw-I (Farm Population : 11,530 , Economic Active Population Rate 70.3% , Agriculture Labour Rate 36.6% , Farm land area 497 ha)													
A. Labour Force Available	72	72	72	72	72	72	72	72	72	72	72	72	866
B. Total Labour Use for Farming Activities	11	8	6	12	8	18	30	13	8	13	23	15	164
C. Balance [A - B]	62	64	66	60	64	54	42	59	64	59	49	58	702
[B/A = %]	15	11	8	16	12	25	42	18	11	18	32	20	19
AL-20 Thika Bhairaw-II (Farm Population : 3,655 , Economic Active Population Rate 72.2% , Agriculture Labour Rate 40.6% , Farm land area 88 ha)													
A. Labour Force Available	26	26	26	26	26	26	26	26	26	26	26	26	313
B. Total Labour Use for Farming Activities	2	1	1	2	1	3	6	2	1	3	4	2	29
C. Balance [A - B]	24	25	25	24	25	23	20	24	25	24	22	24	284
[B/A = %]	6	5	2	8	4	13	22	8	6	10	17	9	9
Sub-Total													
A. Labour Force Available	186	186	186	186	186	186	186	186	186	186	186	186	2,237
B. Total Labour Use for Farming Activities	20	15	12	22	14	35	60	24	15	26	46	28	317
C. Balance [A - B]	167	171	175	164	172	152	126	162	171	161	140	159	1,920
[B/A = %]	11	8	6	12	8	19	32	13	8	14	25	15	14
Total of 13 Project area													
A. Labour Force Available	336	336	336	336	336	336	336	336	336	336	336	336	4,033
B. Total Labour Use for Farming Activities	39	31	24	41	23	64	112	45	30	49	86	52	595
C. Balance [A - B]	297	305	312	295	313	272	225	291	306	287	250	284	3,438
[B/A = %]	12	9	7	12	7	19	33	13	9	15	26	16	15

Source : Farm Survey , JICA Study Team , 1994

Table 1 - 41 Present Labour Balance in Each Scheme (1/3)

<AK-04 Ekwanbhara> (Farm Population : 1,233 , Economically Active Population Rate 80.0% , Agriculture Labour Rate : 43.8% , Farm land area 92 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		11	11	11	11	11	11	11	11	11	11	11	11	120
B. Labour Requirement for Farming Activities														
1) Paddy (90%) (monthly requirement : 1,000 man-days)	83ha	0	0	0	0	0	38 3	68 6	25 2	17 1	29 2	38 3	1 0	216 18
2) Wheat (74%) (monthly requirement : 1,000 man-days)	68ha	19 1	14 1	5 0	25 2	15 1	0	0	0	0	0	15 1	29 2	122 8
3) Maize (10%) (monthly requirement : 1,000 man-days)	9ha	0	0	0	0	50 0	25 0	15 0	35 0	10 0	0	0	0	135 1
4) Mustard (10%) (monthly requirement : 1,000 man-days)	9ha	17 0	41 0	30 0	0	0	0	0	0	0	0	20 0	32 0	140 1
5) Potatoes (12%) (monthly requirement : 1,000 man-days)	11ha	60 1	22 0	53 1	46 1	0	0	0	0	0	0	0	45 0	226 2
6) Broad Bean (0%) (monthly requirement : 1,000 man-days)	0ha	16 0	12 0	57 0	25 0	0	0	0	0	0	0	13 0	24 0	147 0
7) Garden Pea (0%) (monthly requirement : 1,000 man-days)	0ha	7 0	6 0	19 0	17 0	0	0	0	0	0	0	8 0	13 0	70 0
Total Labour Use	(Total area: 180ha)	2	2	1	2	1	3	6	2	1	2	4	3	31
C. Balance [A - B]		8	9	9	8	9	7	5	8	9	8	6	8	95
[B/A = %]		20	15	11	21	14	32	53	23	14	23	41	27	25

2 <AK-05 Boshan> (Farm Population : 2,440 , Economically Active Population Rate 72.1% , Agriculture Labour Rate : 46.5% , Farm land area 122 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		20	20	20	20	20	20	20	20	20	20	20	20	239
B. Labour Requirement for Farming Activities														
1) Paddy (100%) (monthly requirement : 1,000 man-days)	122ha	0	0	0	0	0	38 5	68 8	25 3	17 2	29 4	38 5	1 0	216 26
2) Wheat (58%) (monthly requirement : 1,000 man-days)	71ha	19 1	14 1	5 0	25 2	15 1	0	0	0	0	0	15 1	29 2	122 9
3) Maize (0%) (monthly requirement : 1,000 man-days)	0ha	0	0	0	0	50 0	25 0	15 0	35 0	10 0	0	0	0	135 0
4) Mustard (28%) (monthly requirement : 1,000 man-days)	34ha	17 1	41 1	30 1	0	0	0	0	0	0	0	20 1	32 1	140 5
5) Potatoes (10%) (monthly requirement : 1,000 man-days)	12ha	60 1	22 0	53 1	46 1	0	0	0	0	0	0	0	45 1	226 3
6) Broad Bean (0%) (monthly requirement : 1,000 man-days)	0ha	10 0	20 0	40 0	30 0	0	0	0	0	0	15 0	30 0	10 0	155 0
7) Garden Pea (0%) (monthly requirement : 1,000 man-days)	0ha	40 0	10 0	0	0	0	0	10 0	40 0	75 0	55 0	35 0	55 0	320 0
Total Labour Use	(Total area: 239ha)	3	3	2	2	1	5	8	3	2	4	6	4	43
C. Balance [A - B]		17	17	18	18	19	15	12	17	18	16	14	16	196
[B/A = %]		13	13	10	12	5	23	42	15	10	18	32	19	18

3 <AK-07 Dakshinkali> (Farm Population : 1,412 , Economically Active Population Rate 72.7% , Agriculture Labour Rate : 63.2% , Farm land area 67 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		16	16	16	16	16	16	16	16	16	16	16	16	189
B. Labour Requirement for Farming Activities														
1) Paddy (100%) (monthly requirement : 1,000 man-days)	67ha	0	0	0	0	0	38 3	68 5	25 2	17 1	29 2	38 3	1 0	216 14
2) Wheat (22%) (monthly requirement : 1,000 man-days)	15ha	19 0	14 0	5 0	25 0	15 0	0	0	0	0	0	15 0	29 0	122 2
3) Maize (0%) (monthly requirement : 1,000 man-days)	0ha	0	0	0	0	50 0	25 0	15 0	35 0	10 0	0	0	0	135 0
4) Mustard (35%) (monthly requirement : 1,000 man-days)	23ha	17 0	41 1	30 1	0	0	0	0	0	0	0	20 0	32 1	140 3
5) Potatoes (3%) (monthly requirement : 1,000 man-days)	2ha	60 0	22 0	53 0	46 0	0	0	0	0	0	0	0	45 0	226 0
6) Broad Bean (0%) (monthly requirement : 1,000 man-days)	0ha	10 0	20 0	40 0	30 0	0	0	0	0	0	15 0	30 0	10 0	155 0
7) Garden Pea (37%) (monthly requirement : 1,000 man-days)	25ha	40 1	10 0	0	0	0	0	10 0	40 1	75 2	55 1	35 1	55 1	320 8
Total Labour Use	(Total area: 132ha)	2	1	1	0	0	3	5	3	3	3	4	3	28
C. Balance [A - B]		14	14	15	15	16	13	11	13	13	12	12	13	161
[B/A = %]		11	9	6	3	1	16	30	17	19	21	26	17	15

4 <AK-14 Indrayani> (Farm Population : 1,611 , Economically Active Population Rate 71.1% , Agriculture Labour Rate : 61.9% , Farm land area 101 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		17	17	17	17	17	17	17	17	17	17	17	17	207
B. Labour Requirement for Farming Activities														
1) Paddy (98%) (monthly requirement : 1,000 man-days)	99ha	0	0	0	0	0	38 4	68 7	25 2	17 2	29 3	38 4	1 0	216 21
2) Wheat (78%) (monthly requirement : 1,000 man-days)	79ha	19 1	14 1	5 0	25 2	15 1	0	0	0	0	0	15 1	29 2	122 10
3) Maize (2%) (monthly requirement : 1,000 man-days)	2ha	0	0	0	0	50 0	25 0	15 0	35 0	10 0	0	0	0	135 0
4) Mustard (2%) (monthly requirement : 1,000 man-days)	2ha	17 0	41 0	30 0	0	0	0	0	0	0	0	20 0	32 0	140 0
5) Potatoes (18%) (monthly requirement : 1,000 man-days)	18ha	60 1	22 0	53 1	46 1	0	0	0	0	0	0	0	45 1	226 4
6) Broad Bean (0%) (monthly requirement : 1,000 man-days)	0ha	10 0	20 0	40 0	30 0	0	0	0	0	0	15 0	30 0	10 0	155 0
7) Garden Pea (0%) (monthly requirement : 1,000 man-days)	0ha	40 0	10 0	0	0	0	0	10 0	40 0	75 0	55 0	35 0	55 0	320 0
Total Labour Use	(Total area: 200ha)	3	2	1	3	1	4	7	3	2	3	5	3	36
C. Balance [A - B]		15	16	16	14	16	13	10	15	16	14	12	14	171
[B/A = %]		15	9	8	16	7	22	39	15	10	17	29	19	17

5 <AK-15 Shall Nadi> (Farm Population : 1,780 , Economically Active Population Rate 67.5% , Agriculture Labour Rate : 50.4% , Farm land area 157 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		31	31	31	31	31	31	31	31	31	31	31	31	375
B. Labour Requirement for Farming Activities														
1) Paddy (100%) (monthly requirement : 1,000 man-days)	157ha	0	0	0	0	0	38 6	68 11	25 4	17 3	29 5	38 6	1 0	216 34
2) Wheat (30%) (monthly requirement : 1,000 man-days)	79ha	19 1	14 1	5 0	25 2	15 1	0	0	0	0	0	15 1	29 2	122 10
3) Maize (0%) (monthly requirement : 1,000 man-days)	0ha	0	0	0	0	50 0	25 0	15 0	35 0	10 0	0	0	0	135 0
4) Mustard (15%) (monthly requirement : 1,000 man-days)	8ha	17 0	41 0	30 0	0	0	0	0	0	0	0	20 0	32 0	140 1
5) Potatoes (25%) (monthly requirement : 1,000 man-days)	41ha	60 3	22 1	53 2	46 2	0	0	0	0	0	0	0	45 2	226 10
6) Early Potatoes (12%) (monthly requirement : 1,000 man-days)	19ha	61 1	40 1	0	0	0	0	0	0	0	0	77 1	42 1	226 4
7) Late Potatoes (12%) (monthly requirement : 1,000 man-days)	19ha	0	77 1	62 1	61 1	40 1	0	0	0	0	0	0	0	216 5
Total Labour Use	(Total area: 325ha)	5	5	4	5	2	6	11	4	4	5	9	5	63
C. Balance [A - B]		26	27	27	26	29	25	21	27	29	27	23	26	312
[B/A = %]		17	15	13	16	7	19	34	13	9	15	28	17	17

(continued)

Table 1 - 41 Present Labour Balance in Each Scheme (2/3)

<AH-02 Bidol> (Farm Population : 1,011 , Economically Active Population Rate 65.0% , Agriculture Labour Rate : 60.7% , Farm land area : 32 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man days)		10	10	10	10	10	10	10	10	10	10	10	10	116
B. Labour Requirement for Farming Activities														
1) Paddy (100%)	32ha						38	68	25	17	29	38	1	216
(monthly requirement : 1,000 man days)		0	0	0	0	0	1	2	1	1	1	1	0	7
2) Wheat (80%)	26ha	19	14	5	25	15						15	29	122
(monthly requirement : 1,000 man days)		0	0	0	1	0	0	0	0	0	0	0	1	3
3) Maize (0%)	0ha					50	25	15	35	10				135
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
4) Mustard (0%)	0ha	17	41	30								20	32	140
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
5) Potatoes (10%)	3ha	60	22	53	46								45	226
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	1
6) Broad Bean (0%)	0ha	16	12	57	25							13	24	147
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
7) Garden Pea (0%)	0ha	7	6	19	17							8	13	70
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
Total Labour Use	(Total area: 61ha)	1	0	0	1	0	1	2	1	1	1	2	1	11
C. Balance [A - B]		9	9	9	9	9	9	8	9	9	9	8	9	106
[B/A = %]		7	4	3	8	4	13	22	8	6	10	16	9	9

2 <AH-10 Kulunje> (Farm Population : 967 , Economically Active Population Rate 62.5% , Agriculture Labour Rate : 54.1% , Farm land area : 40 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		8	8	8	8	8	8	8	8	8	8	8	8	95
B. Labour Requirement for Farming Activities														
1) Paddy (95%)	38ha						38	68	25	17	29	38	1	216
(monthly requirement : 1,000 man days)		0	0	0	0	0	1	3	1	1	1	1	0	8
2) Wheat (74%)	30ha	19	14	5	25	15						15	29	122
(monthly requirement : 1,000 man days)		1	0	0	1	0	0	0	0	0	0	0	1	4
3) Maize (5%)	2ha					50	25	15	35	10				135
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
4) Mustard (6%)	2ha	17	41	30								20	32	140
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
5) Potatoes (15%)	6ha	60	22	53	46								45	226
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	1
6) Broad Bean (0%)	0ha	10	20	40	30						15	30	10	155
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
7) Garden Pea (0%)	0ha	40	10					10	40	75	55	35	55	320
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
Total Labour Use	(Total area: 78ha)	1	1	1	1	1	1	3	1	1	1	2	1	14
C. Balance [A - B]		7	7	7	7	7	6	5	7	7	7	6	7	82
[B/A = %]		12	8	7	13	7	19	33	13	8	14	24	16	14

3 <AH-12 Kuludhal> (Farm Population : 803 , Economically Active Population Rate 66.7% , Agriculture Labour Rate : 45.6% , Farm land area : 43 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man days)		6	6	6	6	6	6	6	6	6	6	6	6	71
B. Labour Requirement for Farming Activities														
1) Paddy (100%)	43ha						38	68	25	17	29	38	1	216
(monthly requirement : 1,000 man days)		0	0	0	0	0	2	3	1	1	1	2	0	9
2) Wheat (80%)	34ha	19	14	5	25	15						15	29	122
(monthly requirement : 1,000 man days)		1	0	0	1	1	0	0	0	0	0	1	1	4
3) Maize (0%)	0ha					50	25	15	35	10				135
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
4) Mustard (2%)	1ha	17	41	30								20	32	140
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
5) Potatoes (13%)	6ha	60	22	53	46								45	226
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	1
6) Broad Bean (0%)	0ha	10	20	40	30						15	30	10	155
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
7) Garden Pea (0%)	0ha	40	10					10	40	75	55	35	55	320
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
Total Labour Use	(Total area: 8ha)	1	1	0	1	1	2	3	1	1	1	2	1	15
C. Balance [A - B]		5	5	5	5	5	4	3	5	5	5	4	5	56
[B/A = %]		17	11	8	19	9	27	49	18	12	21	36	22	21

4 <AH-14 Mahadev Khola> (Farm Population : 2,585 , Economically Active Population Rate 75.4% , Agriculture Labour Rate : 65.9% , Farm land area : 112 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man days)		31	31	31	31	31	31	31	31	31	31	31	31	375
B. Labour Requirement for Farming Activities														
1) Paddy (98%)	110ha						38	68	25	17	29	38	1	216
(monthly requirement : 1,000 man days)		0	0	0	0	0	4	7	3	2	3	4	0	24
2) Wheat (80%)	90ha	19	14	5	25	15						15	29	122
(monthly requirement : 1,000 man days)		2	1	0	2	1	0	0	0	0	0	1	3	11
3) Maize (2%)	2ha					50	25	15	35	10				135
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
4) Mustard (5%)	6ha	17	41	30								20	32	140
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	1
5) Potatoes (5%)	6ha	60	22	53	46								45	226
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	1
6) Broad Bean (3%)	3ha	10	20	40	30						15	30	10	155
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	1
7) Garden Pea (0%)	0ha	40	10					10	40	75	55	35	55	320
(monthly requirement : 1,000 man days)		0	0	0	0	0	0	0	0	0	0	0	0	0
Total Labour Use	(Total area: 216ha)	2	2	1	3	1	4	7	3	2	3	6	3	38
C. Balance [A - B]		29	30	30	29	30	27	24	28	29	28	26	28	338
[B/A = %]		7	5	3	8	5	14	24	9	6	10	18	10	10

(continued)

Table 1 - 41 Present Labour Balance in Each Scheme (3/3)

<AL-10 Kotkhu> (Farm Population : 6,862 , Economically Active Population Rate 75.0% , Agriculture Labour Rate : 48.5% , Farm land area : 246 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		61	61	61	61	61	61	61	61	61	61	61	61	729
B. Labour Requirement for Farming Activities														
1) Paddy (92%) (monthly requirement : 1,000 man-days)	226ha	0	0	0	0	0	38 9	68 15	25 6	17 4	29 7	38 9	1 0	216 49
2) Wheat (66%) (monthly requirement : 1,000 man-days)	162ha	19 3	14 2	5 1	25 4	15 2	0	0	0	0	0	15 2	29 5	122 20
3) Maize (6%) (monthly requirement : 1,000 man-days)	15ha	0	0	0	0	50 1	25 0	15 0	35 1	10 0	0	0	0	135 2
4) Mustard (12%) (monthly requirement : 1,000 man-days)	30ha	17 1	41 1	30 1	0	0	0	0	0	0	0	20 1	32 1	140 4
5) Potato (12%) (monthly requirement : 1,000 man-days)	30ha	60 2	22 1	53 2	46 1	0	0	0	0	0	0	0	45 1	226 7
6) Broad Bean (0%) (monthly requirement : 1,000 man-days)	0ha	16 0	12 0	57 0	25 0	0	0	0	0	0	0	13 0	24 0	147 0
7) Garden Pea (0%) (monthly requirement : 1,000 man-days)	0ha	7 0	6 0	19 0	17 0	0	0	0	0	0	0	8 0	13 0	70 0
Total Labour Use	(Total area: 462ha)	5	4	3	5	3	9	16	6	4	7	12	7	81
C. Balance [A - B]		55	57	57	55	58	52	45	55	57	54	49	54	647
[B/A = %]		9	7	5	9	5	15	26	10	7	11	19	12	11

2 <AL-13 Lubhu> (Farm Population : 3,448 , Economically Active Population Rate 67.2% , Agriculture Labour Rate : 48.7% , Farm land area : 130 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		27	27	27	27	27	27	27	27	27	27	27	27	329
B. Labour Requirement for Farming Activities														
1) Paddy (93%) (monthly requirement : 1,000 man-days)	121ha	0	0	0	0	0	38 5	68 8	25 3	17 2	29 4	38 5	1 0	216 26
2) Wheat (65%) (monthly requirement : 1,000 man-days)	85ha	19 2	14 1	5 0	25 2	15 1	0	0	0	0	0	15 1	29 2	122 10
3) Maize (5%) (monthly requirement : 1,000 man-days)	7ha	0	0	0	0	50 0	25 0	15 0	35 0	10 0	0	0	0	135 1
4) Mustard (5%) (monthly requirement : 1,000 man-days)	7ha	17 0	41 0	30 0	0	0	0	0	0	0	0	20 0	32 0	140 1
5) Potato (5%) (monthly requirement : 1,000 man-days)	7ha	60 0	22 0	53 0	46 0	0	0	0	0	0	0	0	45 0	226 1
6) Broad Bean (15%) (monthly requirement : 1,000 man-days)	20ha	10 0	20 0	40 1	30 1	0	0	0	0	0	15 0	30 1	10 0	155 3
7) Garden Pea (0%) (monthly requirement : 1,000 man-days)	0ha	40 0	10 0	0	0	0	0	10 0	40 0	75 0	55 0	35 0	55 0	320 0
Total Labour Use	(Total area: 244ha)	2	2	2	3	2	5	8	3	2	4	7	3	43
C. Balance [A - B]		25	25	26	24	26	23	19	24	25	24	20	24	287
[B/A = %]		8	7	6	11	6	17	30	12	8	14	24	12	13

3 <AL-19 Thika Bhalraw-I> (Farm Population : 11,530 , Economically Active Population Rate 70.3% , Agriculture Labour Rate : 56.6% , Farm land area : 497 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		72	72	72	72	72	72	72	72	72	72	72	72	866
B. Labour Requirement for Farming Activities														
1) Paddy (87%) (monthly requirement : 1,000 man-days)	432ha	0	0	0	0	0	38 16	68 29	25 11	17 7	29 13	38 16	1 0	216 93
2) Wheat (75%) (monthly requirement : 1,000 man-days)	373ha	19 7	14 5	5 2	25 9	15 6	0	0	0	0	0	15 6	29 11	122 45
3) Maize (11%) (monthly requirement : 1,000 man-days)	55ha	0	0	0	0	50 3	25 1	15 1	35 2	10 1	0	0	0	135 7
4) Mustard (8%) (monthly requirement : 1,000 man-days)	40ha	17 1	41 2	30 1	0	0	0	0	0	0	0	20 1	32 1	140 6
5) Potato (9%) (monthly requirement : 1,000 man-days)	45ha	60 3	22 1	53 2	46 2	0	0	0	0	0	0	0	45 2	226 10
6) Broad Bean (3%) (monthly requirement : 1,000 man-days)	15ha	10 0	20 0	40 1	30 0	0	0	0	0	0	15 0	30 0	10 0	155 2
7) Garden Pea (0%) (monthly requirement : 1,000 man-days)	0ha	40 0	10 0	0	0	0	0	10 0	40 0	75 0	55 0	35 0	55 0	320 0
Total Labour Use	(Total area: 959ha)	11	8	6	12	8	18	30	13	8	13	23	15	164
C. Balance [A - B]		62	64	66	60	64	54	42	59	64	59	49	58	702
[B/A = %]		15	11	8	16	12	25	42	18	11	18	32	20	19

4 <AL-20 Thika Bhalraw-II> (Farm Population : 3,655 , Economically Active Population Rate 72.2% , Agriculture Labour Rate : 40.6% , Farm land area : 88 ha)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Labour Force Available (1'000 man-days)		26	26	26	26	26	26	26	26	26	26	26	26	313
B. Labour Requirement for Farming Activities														
1) Paddy (98%) (monthly requirement : 1,000 man-days)	86ha	0	0	0	0	0	38 3	68 6	25 2	17 1	29 3	38 3	1 0	216 19
2) Wheat (85%) (monthly requirement : 1,000 man-days)	75ha	19 1	14 1	5 0	25 2	15 1	0	0	0	0	0	15 1	29 2	122 9
3) Maize (0%) (monthly requirement : 1,000 man-days)	0ha	0	0	0	0	50 0	25 0	15 0	35 0	10 0	0	0	0	135 0
4) Mustard (2%) (monthly requirement : 1,000 man-days)	2ha	17 0	41 0	30 0	0	0	0	0	0	0	0	20 0	32 0	140 0
5) Potato (3%) (monthly requirement : 1,000 man-days)	3ha	60 0	22 0	53 0	46 0	0	0	0	0	0	0	0	45 0	226 1
6) Broad Bean (2%) (monthly requirement : 1,000 man-days)	2ha	10 0	20 0	40 0	30 0	0	0	0	0	0	15 0	30 0	10 0	155 0
7) Garden Pea (0%) (monthly requirement : 1,000 man-days)	0ha	40 0	10 0	0	0	0	0	10 0	40 0	75 0	55 0	35 0	55 0	320 0
Total Labour Use	(Total area: 167ha)	2	1	1	2	1	3	6	2	1	3	4	2	29
C. Balance [A - B]		24	25	25	24	25	23	20	24	25	24	22	24	284
[B/A = %]		6	5	2	8	4	13	22	8	6	10	17	9	9

Source : Farm Survey, JICA Study Team, 1991

Table 1 - 42 Present Unit Yield and Crop Production

Scheme No./Name	Farm Land (ha)	Planted Area by Crops (ha)								Unit Yield (ton / ha)								Production (ton)							
		Paddy	Wheat	Maize	Mustard	Potatoes	E.L. Potatoes	Bean	Pea	Paddy	Wheat	Maize	Mustard	Potatoes	E.L. Potatoes	Bean	Pea	Paddy	Wheat	Maize	Mustard	Potatoes	E.L. Potatoes	Bean	Pea
Kathmanu District																									
AK - 04 Biswambhara	92	83	68	9	9	11	0	0	0	3.60	1.10	1.35	0.72	8.00				298	75	12	7	88	0	0	0
AK - 05 Boshan	122	122	71	0	34	12	0	0	0	4.20	1.90		0.81	11.50				512	134	0	28	140	0	0	0
AK - 07 Dakshinkali	67	67	15	0	23	2	0	0	25	3.80	2.10		0.72	8.25			0.82	255	31	0	17	17	0	0	20
AK - 14 Indrayani	101	99	79	2	2	18	0	0	0	3.80	1.40	1.40	0.45	10.70				376	110	3	1	195	0	0	0
AK - 25 Shali Nadi	157	157	79	0	8	38	44	0	0	4.00	1.40		0.49	14.20	8.50			628	110	0	4	535	374	0	0
Sub-total	539	528	311	11	77	81	44	0	25	3.92	1.58	1.38	0.64	10.53	8.50		0.82	2,069	491	15	49	854	374	0	20
Bhaktapur District																									
AB - 02 Bidol	32	32	26	0	0	3	0	0	0	4.10	1.70			10.30				131	44	0	0	33	0	0	0
AB - 10 Katunje	40	38	30	2	2	6	0	0	0	4.50	2.10	1.60	0.50	10.50				171	62	3	1	63	0	0	0
AB - 12 Kutudhal	43	43	34	0	1	6	0	0	0	4.10	2.20		0.40	11.40				176	76	0	0	64	0	0	0
AB - 14 Mahadev Khola	112	110	90	2	6	6	0	3	0	4.20	2.40	1.40	0.40	11.60		1.23		461	215	3	2	65	0	4	0
Sub-total	227	223	179	4	9	20	0	3	0	4.22	2.10	1.50	0.43	10.95		1.23		939	376	6	4	223	0	4	0
Lalitpur District																									
AL - 10 Kotkhu	246	226	162	15	30	30	0	0	0	4.20	1.70	1.45	0.50	9.30				951	276	21	15	275	0	0	0
AL - 13 Lubhu	130	121	85	7	7	7	0	20	0	4.60	2.30	1.49	0.50	9.00		1.50		556	194	10	3	59	0	29	0
AL - 19 Thika Bhairaw-(I)	497	432	373	55	40	45	0	15	0	4.60	2.10	1.47	0.74	9.40		1.52		1,989	783	80	29	420	0	23	0
AL - 20 Thika Bhairaw-(II)	88	86	75	0	2	3	0	2	0	4.40	2.40		0.62	9.50		1.11		379	180	0	1	25	0	2	0
Sub-total	961	866	694	76	78	83	0	36	0	4.48	2.13	1.47	0.59	9.30		1.38		3,875	1,476	112	46	776	0	50	0
Total / Average	**1,727**	**1,616**	**1,184**	**91**	**163**	**185**	**44**	**40**	**25**	**4.26**	**1.98**	**1.46**	**0.60**	**10.02**	**8.50**	**1.36**	**0.82**	**6,884**	**2,343**	**133**	**99**	**1,853**	**374**	**54**	**20**

Source : Farm Survey , JICA Study Team 1994

Table 1 - 43 Present Livestock Population

Livestocks		Cattle		Buffalo		Goat / Sheep		Chicken		Duck	
		No./FH*	Total	No./FH*	Total	No./FH*	Total	No./FH*	Total	No./FH*	Total
Nepal		8.3	6,245,682	4.1	3,058,341	8.4	6,318,165	17.9	13,496,245	0.5	389,542
Kathmandu Valley		0.8	81,942	0.3	31,706	1.3	119,856	11.3	1,096,171	0.1	9,994
Project areas		0.7	4,955	0.2	1,288	1.0	6,621	17.9	122,203	0.1	710
Kathmandu District											
AK - 04	Biswambhara	1.9	414	0.6	134	3.1	694	7.9	1,758	0.0	0
AK - 05	Boshan	1.2	501	0.2	65	0.9	371	13.9	6,060	0.0	0
AK - 07	Dakshinkali	1.8	104	1.6	93	1.4	81	0.2	9	0.0	0
AK - 14	Indrayani	0.7	191	0.8	205	2.6	696	111.3	30,371	0.0	0
AK - 25	Shali Nadi	0.4	244	0.3	145	0.9	511	26.2	15,205	0.1	76
	Average/Sub-total	0.9	1,455	0.4	643	1.5	2,354	34.0	53,404	0.0	76
Bhaktapur District											
AB - 02	Bidol	1.1	45	1.4	58	3.1	129	44.4	1,866	0.0	0
AB - 10	Katunje	1.6	261	0.1	21	0.8	136	0.1	11	0.1	21
AB - 12	Kutudhal	1.8	144	1.2	97	1.4	113	76.6	6,284	0.0	0
AB - 14	Mahadev Khola	0.7	297	0.2	72	2.4	1,051	29.4	12,663	0.1	54
	Average/Sub-total	1.0	746	0.3	248	2.0	1,428	28.8	20,823	0.1	75
Lalitpur District											
AL - 10	Kotkhu	1.0	1,295	0.0	0	0.7	907	30.2	39,109	0.0	0
AL - 13	Lubhu	0.0	0	0.0	0	0.0	0	0.9	509	0.4	226
AL - 19	Thika Bhairaw-(I)	0.7	1,392	0.2	398	0.7	1,392	4.0	7,952	0.1	199
AL - 20	Thika Bhairaw-(II)	0.1	68	0.0	0	0.8	542	0.6	406	0.2	135
	Average/Sub-total	0.6	2,754	0.1	398	0.6	2,840	10.6	47,976	0.1	560

Source : Nepal , KTM Valley ; Annex 1 Chapter 1 Table 1- 6
Project areas ; Farm Survey , JICA Study Team, 1994

Remarks : * Average number per Farm Household (FH)

Table 1 - 44 Prevailing Vegetable Prices

(Unit : NRs./kg)

Crops	Farm-gate	Wholesale	Retail
Potatoes	6.45	7.03	8.05
Cauliflower	9.73	12.26	16.50
Cabbage	5.50	5.92	8.53
Radish	2.50	3.26	4.68
Tomato	8.50	10.07	14.62
Brinjal	4.00	5.82	9.03
Green chilli	9.00	20.82	-
Beans	10.00	11.72	-
Onion	6.00	6.24	8.27
Ginger	14.53	-	19.06
Pointed Gourd		12.03	12.58
Carrot	6.00		
Broad leaf mustard	6.56		
Spinach	10.80		
Cress	10.00		
Coriander	15.00		
Lettuce	10.00		
Cucumber	8.68		
Garlic	11.65		

Table 1 - 45 Prices of Farm Inputs

(Unit : NRs./Unit)

Input	Unit	FY92/93			FY91/92		FY90/91
		Feb.'93	Jan.'93	Nov.'92	July'92	Aug.'91	
1. Fertilizer							
Urea (46:0:0)	Kg	5.60	5.14	5.14	5.71	5.14	4.07
Complex (20:20:0)	Kg	10.00	10.00	10.00	6.30	5.68	4.50
DAP (18:46:0)	Kg	12.50	12.50	11.00	8.36	7.52	6.32
A. Sulfate (21:0:0)	Kg	6.90	6.90	4.20	4.67	4.20	3.11
Potash (0:0:60)	Kg	8.50	8.50	6.00	3.21	2.90	2.32
TSP (0:46:0)	Kg	8.00	8.00	8.00	5.15	4.64	3.96
2. Crop Seed							
Paddy	Kg		16.70				
Wheat	Kg		12.00		12.05		9.55
Maize	Kg		14.70		14.70		11.00
3. Vegetables Seed							
Cauliflower	Kg		300.00				
Cabbage (late large)	Kg		150.00				
Cabbage (pride of India)	Kg		180.00				
Broccoli	Kg		150.00				
Cress	Kg		50.00				
Radish (ME-L)	Kg		55.00				
Radish (Tokinashi)	Kg		125.00				
Broad Leaf Mustard (MBL)	Kg		80.00				
Broad Leaf Mustard (KBL)	Kg		50.00				
Fenugreek (L)	Kg		30.00				
Fenugreek (I)	Kg		60.00				
Spinach	Kg		50.00				
Onion	Kg		225.00				
Bitter Gourd	Kg		150.00				
Cucumber	Kg		250.00				
Tomato	Seedlings		0.10				
4. Pesticide/Insecticide							
BHC Dust	Kg		6.00				
Hinosan	100 ml bottle		50.80				
Metacid	100 ml bottle		59.95				

Table 1 - 46 Number of Mills

Type of Mill	Number of Mills*						
	Rice	Rice & Flour	Flour	Beaten Rice	Oil	Rice,Flour & Oil	Total
Kathmandu District							
AK - 04 Biswambhara	12	1	0	1	0	0	14
AK - 05 Boshan	4	0	3	0	0	0	7
AK - 07 Dakshinkali	5	0	0	2	1	0	8
AK - 14 Indrayani	7	0	0	0	0	0	7
AK - 25 Shali Nadi	(same as AK-04 Biswambhara)						0
Sub-total	28	1	3	3	1	0	36
Bhaktapur District							
AB - 02 Bidol	11	2	3	0	0	0	16
AB - 10 Katunje	12	1	0	0	2	2	17
AB - 12 Kutudhal	4	1	4	0	0	0	9
AB - 14 Mahadev Khola	16	3	0	4	0	1	24
Sub-total	43	7	7	4	2	3	66
Lalitpur District							
AL - 10 Kotkhu	24	1	1	4	8	0	38
AL - 13 Lubhu	16	0	1	2	0	2	21
AL - 19 Thika Bhairaw-(I)	33	1	3	4	7	0	48
AL - 20 Thika Bhairaw-(II)	(same as AL-19 Thika Bhairaw -(I))						
Sub-total	73	2	5	10	15	2	107
Total / Average	144	10	15	17	18	5	209

Source : Cottage and village industry branch office , Kathmandu, Bhaktapur , Lalitpur

Remarks : * number include the mills locatedin VDC covering scheme area

Table 1 - 47 Exiting Cold Storage in the Kathmandu Valley

Items	Kathmandu Valley	
	Kohinoor	Himalaya
<General Information>		
General Information		
Location	Kathmandu	Bhaktapur
Year Established	1972	1987
Capacity (MT)	2,000	1,000
Preserved Items	P, V, F	P
Storage amount		
1993/94	1,200	700
1992/93	1,000	700
1991/92	1,000	700
Serving area	Bhaktapur	Nala
	Thimi	Panuati
	Patan	Panchakhal
	Kathmandu	Tinpipile
		Charikot
Storage month	6	6
Permanent staff	10	7
Registration under	MoI	MoI
Facilities to the Clients		
Transport	No	No
Loading / unloading	No	No
Drying / shed facility	Yes	Yes
Loan facility	Yes	No
Major Problems	B, C	A, B
Suggestions	A, D, E	A, B, C, D

Items	Kathmandu Valley	
	Kohinoor	Himalaya
<Technical & Financial>		
Technical		
Compressor type	Bunker	Diffuser
Stand-by gener.	No	70kw
Temp. (deg F)	35 - 36	35 - 37
Humidity (%)	NR	85 - 90
Ventilation	Door	Door
Maintenance engg.	Hired	Hired, manager
Storage designer	Indian	Local
Drying shade	Available	Available
Total area (ha)	0.45	0.25
Financial		
Rental charge (NRs./kg)	1.7	1.7
Buying / Selling	No	No
Elec. cost		
/ season (NRs.)	5,000,000	3,000,000
/ month run period	60,000	50,000
/ month nonrun period	25,000	2,000
Total admi. cost/ year	3,500,000	2,000,000
Loan	Nabil Bank	NIDC
Loan amount	NR	2,500,000
Interest rate (%)	NR	16%
Fixed asset	NR	50,000/ha
Constr. cost (NRs.)	NR	35,000,000
Tax / year	32,000	20,000

Remarks : Nr ; no response
P,F,V ; Potato, Fruits, Vegetables
MoI ; Ministry of Industry
DoI ; Department of Industy
NIDC ; Nepal Insustrial Development Corporation
ADB ; Agricultual Development Bank

Major Problems :
A ; Monopoly and unjustifiable system of tax assessment
B ; High electricity charge
C ; Poor extension (as a result farmers are unaware of the existing cold storages)
D ; Lack of loan facilities to farmers for production
E ; Lack of strong administration power (policy, technician, authority)

Major Problems :
A ; Cold storage should be categorized under agrobased industry
B ; Subsidy on capital investment by government
C ; Interest rate should not be above 10%
D ; Subsidy on electricity charge
E ; There shouod be more seed supply so that they can operate their strage

Table 1 - 48 Present Extension Activities of the Agricultural Sub-Centre

District / Name of Sub-center	Covered Area: Covered V.D.C*	Covered Area: Covered Scheme	Extension Worker: JT	Extension Worker: JTA	Demonstration / Mini kit: Result Dem.	Demonstration / Mini kit: Prod. Dem.	Demonstration / Mini kit: Mini Kit
Kathmandu District							
Agriculture Sub-Center Indrayani	Suntole Indrayani Bajrajogini Pukhulachi	AK - 04 Biswambhara AK - 14 Indrayani AK - 25 Shali Nadi	2	3	7	4	44
Agriculture Sub-Center Lapsephedi	Lapsephedi	AK - 25 Shali Nadi	2	3	3	7	79
Agriculture Sub-Center Kirtipur, Bahanigaun	Panga Balkumari Chobar Bhutkhel	AK - 05 Boshan	2	3	7	4	79
Agriculture Sub-Center Dakshinkali	Dakshinkali	AK - 07 Dakshinkali	2	3	5	3	79
Sub- total			8	12	22	18	281
Bhaktapur District							
Agriculture Sub-Center Nangkhel	Tathali	AB - 02 Bidol	1	3	4	-	36
Agriculture Sub-Center Katunje	Katunje	AB - 10 Katunje	1	4	5	1	50
Agriculture Sub-Center Sirutar	Dadhikot Balkot	AB - 14 Mahadev Khola	2	3	4	-	85
Agriculture Sub-Center Kharipati	Sudal Bageswari	AB - 02 Bidol AB - 12 Kutudhal	1	6	6	1	105
Sub- total			5	16	19	2	276
Lalitpur District							
Agriculture Sub-Center Thaiba	Thaiba	AL - 10 Kotkhu	1	2	4	1	-
Agriculture Sub-Center Lubhu	Lamatar Lubhu Tikatali	AL - 13 Lubhu	1	2	8	2	-
Agriculture Sub-Center Chapagaun	Chapagaun Thecho Sunakoti Dhapakhel	AL - 19 Thika Bhairaw-(I) AL - 20 Thika Bhairaw-(II)	1	2	6	1	-
Sub- total			3	6	18	4	-
Total			16	34	59	24	557

Source : District Agricultural Development Office , Kathmandu, Lalitpur , Baktapur, 1994

Table 1 - 49 Present Farmers' Budget in the 13 Selected Model Schemes

(Unit : NRs.)

Scheme No. / Scheme Name		AK-04 Biswam-bhara	AK-05 Boshan	AK-07 Dakshin-kali	AK-14 Indrayani	AK-25 Shali Nadi	AB-02 Bidol	AB-10 Katunje	AB-12 Kumdhal	AB-14 Mahadev Khola	AL-10 Kotkhu	AL-13 Lubhu	AL-19 Thika Bhairaw-I	AL-20 Thika Bhairaw-II
Holding Size (ha)		0.41	0.28	0.28	0.37	0.27	0.19	0.24	0.30	0.26	0.19	0.23	0.25	0.13
No. of Family		5.9	5.6	5.9	5.7	6.4	6.0	5.9	5.6	5.9	5.3	6.2	5.8	5.9
Farm Income														
Gross Farm Income		23,800	16,420	14,940	23,810	20,430	11,290	14,680	18,520	14,650	10,880	12,470	13,830	7,160
Paddy	Planted Area (ha)	0.369	0.280	0.280	0.363	0.270	0.190	0.228	0.300	0.255	0.175	0.214	0.218	0.127
	Production	1,561	1,184	1,184	1,534	1,142	804	964	1,269	1,078	739	905	920	539
	Gross Income	14,494	10,998	10,998	14,243	10,606	7,463	8,956	11,784	10,009	6,866	8,402	8,543	5,004
Wheat	Planted Area (ha)	0.303	0.162	0.062	0.289	0.135	0.152	0.178	0.240	0.208	0.125	0.150	0.188	0.111
	Production	604	323	123	574	269	302	353	478	414	250	298	373	220
	Gross Income	4,976	2,663	1,010	4,733	2,214	2,493	2,913	3,936	3,411	2,057	2,452	3,075	1,812
Maize	Planted Area (ha)	0.041			0.007			0.012		0.005	0.011	0.012	0.028	
	Production	60			11			18		8	17	17	40	
	Gross Income	463			84			135		59	129	130	310	
Mustard	Planted Area (ha)	0.041	0.078	0.098	0.007	0.014		0.014	0.060	0.013	0.025	0.012	0.020	0.003
	Production	25	47	59	4	8		9	4	8	14	7	12	2
	Gross Income	415	794	993	75	137		146	61	132	231	116	203	26
Potatoes	Planted Area (ha)	0.049	0.028	0.008	0.067	0.065	0.019	0.036	0.039	0.013	0.023	0.012	0.023	0.004
	Production	493	281	84	667	649	190	361	391	130	228	115	225	39
	Gross Income	3,451	1,964	589	4,671	4,545	1,333	2,525	2,735	912	1,599	807	1,578	274
E.L. Potatoes	Planted Area (ha)					0.076								
	Production					643								
	Gross Income					2,925								
Legumes	Planted Area (ha)			0.104						0.008		0.035	0.008	0.003
	Production			84						11		47	10	4
	Gross Income			1,351						127		563	122	42
Vegetables	Planted Area (ha)													
	Production													
	Gross Income													
Livestock Income		7,150	2,100	5,780	3,100	1,510	2,790	2,930	5,960	1,780	590		630	330
	Total Farm Income	30,950	18,520	20,720	26,910	21,940	14,080	17,610	24,480	16,430	11,470	12,470	14,460	7,490
Non Farm Income		19,790	18,560	19,770	25,800	29,400	20,270	25,890	18,560	19,260	19,750	23,100	21,610	27,100
	Gross Family Income	50,740	37,080	40,490	52,710	51,340	34,350	43,500	43,040	35,690	31,220	35,570	36,070	34,590
Production Cost (Farm Expense)		7,340	4,820	3,810	7,300	6,700	3,470	4,490	5,690	4,510	3,300	3,740	4,290	2,230
Living Expense **		30,680	28,860	30,410	29,640	32,990	30,300	29,890	31,520	29,900	26,860	27,640	30,740	30,980
	Net Reserve	12,720	3,400	6,270	15,770	11,650	580	9,120	5,830	1,280	1,060	4,190	1,040	1,380
Per Capita Monthly Income		717	552	572	771	668	477	614	640	504	491	478	518	489
Net Farm Income ***		43,400	32,260	36,680	45,410	44,640	30,880	39,010	37,350	31,180	27,920	31,830	31,780	32,360

Remarks :

*: Farm Survey, JICA Study Team, 1994.

**: Estimated 100 % of Present Situation for "Without Project Condition" and 115 % of Present situation for "With Project Condition".

***: Net Farm Income = Gross Farm Income - Production Cost.

Table 1 - 50 Present Living Expense of Typical Farms in Each Scheme

(Unit : NRs.)

Scheme No.	AK-04	AK-05	AK-07	AK-14	AK-25	AB-02	AB-10	AB-12	AB-14	AL-10	AL-13	AL-19	AL-20
Size	0.41	0.28	0.28	0.37	0.27	0.19	0.24	0.30	0.26	0.19	0.23	0.25	0.13
Av. Famly No.	5.9	5.6	5.9	5.7	6.4	6.0	5.9	5.6	5.9	5.3	6.2	5.8	5.9
Living Expense													
Food	18,684	18,413	19,827	19,444	17,650	16,786	16,200	20,330	19,495	14,854	15,810	17,184	17,783
	(60.9%)	(63.8%)	(65.2%)	(65.6%)	(53.5%)	(55.4%)	(54.2%)	(64.5%)	(65.2%)	(55.3%)	(57.2%)	(55.9%)	(57.4%)
Clothing	3,988	4,040	3,953	3,527	4,388	4,454	3,975	3,908	3,588	2,981	2,957	3,443	3,377
	(13.0%)	(14.0%)	(13.0%)	(11.9%)	(13.3%)	(14.7%)	(13.3%)	(12.4%)	(12.0%)	(11.1%)	(10.7%)	(11.2%)	(10.9%)
Housing	1,810	1,847	1,794	1,393	2,672	3,060	2,630	1,860	2,063	3,599	3,759	4,273	4,058
	(5.9%)	(6.4%)	(5.9%)	(4.7%)	(8.1%)	(10.1%)	(8.8%)	(5.9%)	(6.9%)	(13.4%)	(13.6%)	(13.9%)	(13.1%)
Medicine	706	606	699	948	1,287	1,000	1,734	788	688	1,477	1,354	1,568	1,487
	(2.3%)	(2.1%)	(2.3%)	(3.2%)	(3.9%)	(3.3%)	(5.8%)	(2.5%)	(2.3%)	(5.5%)	(4.9%)	(5.1%)	(4.8%)
Education	3,590	1,962	1,581	1,334	3,893	3,060	2,451	1,923	1,555	1,907	1,880	2,121	2,076
	(11.7%)	(6.8%)	(5.2%)	(4.5%)	(11.8%)	(10.1%)	(8.2%)	(6.1%)	(5.2%)	(7.1%)	(6.8%)	(6.9%)	(6.7%)
Transport	614	866	1,277	1,778	1,485	606	1,285	1,103	1,256	860	802	891	898
	(2.0%)	(3.0%)	(4.2%)	(6.0%)	(4.5%)	(2.0%)	(4.3%)	(3.5%)	(4.2%)	(3.2%)	(2.9%)	(2.9%)	(2.9%)
Social Expense	1,289	1,126	1,277	1,215	1,617	1,333	1,614	1,608	1,256	1,182	1,078	1,260	1,301
	(4.2%)	(3.9%)	(4.2%)	(4.1%)	(4.9%)	(4.4%)	(5.4%)	(5.1%)	(4.2%)	(4.4%)	(3.9%)	(4.1%)	(4.2%)
Total	30,680	28,860	30,410	29,640	32,990	30,300	29,890	31,520	29,900	26,860	27,640	30,740	30,980
	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)

Table 1 - 51 Brick Factories in the Kathmandu Valley

Scheme No./Name	up to 1991	Newly established 1992	Newly established 1993	Newly established 1994	Total
Kathmandu District					
No. of Factory	65	0	0	6	71
Production (ton)	141,538	0	0	18267	159,805
Bhaktapur District					
No. of Factory	26	4	4	6	40
Production (ton)	39,696	8832	7,455	13,963	69,946
Lalitpur District					
No. of Factory	109	0	0	7	116
Production (ton)	117,809	0	0	29,679	147,488
Kathmandu Valley Total					
No. of Factory	200	4	4	19	227
Production (ton)	299,043	8,832	7,455	61,909	377,239

Source : Department of Cottage and Small Industry, Minitry of Industry , 1994

Note : Wetght of one brick is estimated at 2.3 kg
Price of one brick is estimated at NRs. 2.6

Table 1 -52 Present Land Price of Paddy Fields

Scheme No./Name		Road side		Hill side	
		'000 NRs. / Ropani	million NRs. / ha	'000 NRs. / Ropani	'000 NRs. / ha
Kathmandu District					
AK - 04	Biswambhara	200	(4)	100	(2)
AK - 05	Boshan	800	(16)	400	(8)
AK - 07	Dakshinkali	600	(12)	80	(1.6)
AK - 14	Indrayani	200	(4)	100	(2)
AK - 25	Shali Nadi	1,600	(32)	80	(1.6)
Sub-average		680	(14)	152	(4)
Bhaktapur District					
AB - 02	Bidol	500	(10)	100	(2)
AB - 10	Katunje	300	(6)	300	(6)
AB - 12	Kutudhal	200	(4)	200	(4)
AB - 14	Mahadev Khola	1,600	(32)	150	(3)
Sub-average		650	(13)	188	(4)
Lalitpur District					
AL - 10	Kotkhu	1,000	(20)	150	(3)
AL - 13	Lubhu	400	(8)	80	(1.6)
		1,000	(20)	200	(4)
AL - 19	Thika Bhairaw-(I)	500	(10)	50	(1)
AL - 20	Thika Bhairaw-(II)	800	(16)	300	(6)
Sub-average		740	(15)	156	(4)
Average		693	(14)	164	(3)

Source : Farm Survey , JICA Study Team , 1994

Table 1 - 53 Main Ethnic Groups

Scheme No./Name	Newar		Brahmin		Chhetri		Tamang		others		Total
Kathmandu District											
AK - 04 Biswambhara	41	(18)	71	(31)	69	(30)	39	(17)	9	(4)	229
AK - 05 Boshan	174	(35)	75	(15)	149	(30)	50	(10)	50	(10)	498
AK - 07 Dakshinkali	38	(65)	13	(23)	6	(10)	1	(2)	0	(0)	58
AK - 14 Indrayani	47	(15)	16	(5)	232	(74)	6	(2)	13	(4)	314
AK - 25 Shali Nadi	637	(91)	7	(1)	42	(6)	7	(1)	7	(1)	700
Sub-total	937	(52)	182	(10)	498	(28)	103	(6)	79	(4)	1,799
Bhaktapur District											
AB - 02 Bidol	27	(62)	11	(26)	3	(7)	0	(0)	2	(5)	43
AB - 10 Katunje	53	(30)	53	(30)	53	(30)	0	(0)	18	(10)	177
AB - 12 Kutudhal	58	(60)	19	(20)	10	(10)	0	(0)	10	(10)	97
AB - 14 Mahadev Khola	186	(38)	83	(17)	196	(40)	0	(0)	25	(5)	490
Sub-total	324	(40)	167	(21)	262	(32)	0	(0)	54	(7)	807
Lalitpur District											
AL - 10 Kotkhu	619	(41)	45	(3)	830	(55)	39	(0)	15	(1)	1,509
AL - 13 Lubhu	431	(68)	44	(7)	139	(22)	39	(0)	19	(3)	634
AL - 19 Thika Bhairaw-(I)	1,529	(68)	157	(7)	450	(20)	22	(1)	90	(4)	2,249
AL - 20 Thika Bhairaw-(II)	1,308	(80)	0	(0)	327	(20)	0	(0)	0	(0)	1,635
Sub-total	3,887	(64)	247	(4)	1,746	(29)	8	(0)	124	(2)	6,027
Total	5,149	(60)	596	(7)	2,506	(29)	145	(1)	257	(3)	8,633

Source : Farm Survey , JICA Study Team , 1994