ANNEX - 4

DATA AND RESULTS OF THE HYDROLOGICAL STUDY

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1. GENERAL

1.1 Introduction

This Annex presents the results of meteorological and hydrological study made in the master plan study on Rehabilitation for the Government Developed Irrigation Schemes in the Kathmandu Valley. Field investigation were made during two periods from April to May in the dry season and from June to August, 1993 in rainy season and studies were made in Japan from August to October 1993 in Phase I Study, and reviewed and revised during the Phase II Study from April to August, 1994.

Investigations and studies are carried out to clarify the natural conditions in the study area in order mainly to assess the potentiality of surface water resources for the existing irrigation schemes for rehabilitation. The results are incorporated in the formulation of the basic rehabilitation plan in the Kathmandu Valley. The objective of the meteorological and hydrological study covers; 1) to collect and analyse the agro-meteorological data, 2) to clarify the present and planned water uses in the valley, and 3) to assess the surface water resources for the potential schemes for rehabilitation.

1.2 Study Area

The area of the meteorological and hydrological study is the Kathmandu Valley defined topographically. The study area is composed administratively of three districts, the most part of the Kathmandu, northern part of the Lalitpur and whole the Bhaktapur districts between the latitude 27°32'N and 27°49'N and between the longitude 85°12'E and 85°32'E. The Kathmandu valley is located in the upstream of the Bagmati river basin, which is situated between the eastern and central river systems of Nepal, namely the Sapt Koshi and the Gandaki river systems.

The Kathmandu Valley has the shape of an circular basin with an area of 656 km^2 and consists of very gentle and flat lands at the elevations of 1,300 to 1,400 m surrounded by high mountain ranges of more than 2,000 m in elevation. The Bagmati river is the only one river system in the valley, and it drains all the surface runoff in the valley to the south dissecting the mountains of Mahabarat range to the Southwest of the valley.

1.3 Meteorological and Hydrological Observation

There is a number of meteorological stations in and around the valley currently being operated under the Department of Meteorology and Hydrology (DoHM), the Ministry of Water Resources. Their inventory and locations are shown on Table 4-1 and Fig. 4-1, respectively. Duration of the observed data varies station to station and missing data or long gap of recording are found in most stations, as shown in Fig. 4-2.

Most stations continued to date started the observation in 1970's. All stations are equipped with standard rain gauge and/or automatic recording rain gauge. The key station in the study area is the Kathmandu Airport station (Tribhuban International Airport) located at the centre of the valley, which is well equipped with the automatic recording instruments.

Agro-meteorological data has been taken at some stations in the valley, which are the Kathmandu airport, Indian embassy, Khumaltar, Godawari and Nagarkot stations. The data were obtained from DoHM on monthly basis as described in the following Section 4.2.3.

There are several hydrological stations within the valley registered in DoHM, but the data are generally interrupted or some stations were closed already. The stream flow data are available at Sundarijal, Gauri Ghat, Budhanilkantha, Mahankal, Shyamdado, Thika Bhairaw and Chobhar stations. The inventory of these stations and their location are shown in Table 4-2 and Fig. 4-1. The recording duration of each runoff data are shown in Fig. 4-3. At the intake

points of irrigation schemes, no continual and systematic discharge observation has been executed, while only some spot measurements have been done with a current meter or floating devices at limited points by DoHM and DoI. The peak discharge record of annual maximum flood of the Bagmati river and the tributaries at above stations were also obtained from DoHM.

2. METEOROLOGY

2.1 Climate

The Kathmandu Valley falls under the monsoon region having a distinct rainy season and its climate is classified as sub-tropical. The climate is much influenced by the Southeast and the Northwest monsoons prevailing in the rainy and dry seasons. Most rainfall occurs during the rainy season from June to September. October to November is warm while December to February is cool. In winter month, rainfall is brought by the trade wind from Northwest with occasional snow in mountain area. The spring months, March to June, are dry and hot accomplished by pre-monsoon thunderstorms with occasional hail and showers.

Generally speaking, the climate of the Kathmandu Valley is suitable for the rice cultivation in the monsoon season and for the winter crops in the dry season. Although, the total rainfall depth itself is affluent in normal rainy season, the concentration of rainfall hampers effective cultivation. In particular, transplanting date of rice, a predominant monsoon crop, largely depends on rainfall in June, which varies by large extent. In case the transplanting date is delayed, the yield is reduced due to water shortage in the late growing stage, and winter crop cultivation is also influenced.

2.2 Precipitation

Rainfall varies substantially according to the altitude. Average annual rainfall varies from 1,220 mm at Khumaltar in the valley bottom to 2,740 mm at Kakani in the mountain area just outside of the valley rim. The rainfall generally increases in the mountainous and hilly area, and the rainfall on south facing slope is higher than on those facing to the north. Annual rainfall varies quite a lot ranging from about 1,000 mm to 2,000 mm in the valley area to 1,500 mm to 3,300 mm in the mountain area as seen in Table 4-3. The monthly rainfall at respective stations in the valley are shown on Tables 4-4 and 4-5, and illustrated in Fig. 4-4.

Since the almost existing rainfall stations are situated in the low area, these stations do not represent high mountain ranges sufficiently. Taking into consideration the relationship between rainfall and altitude derived based on the annual rainfall data, an isohyetal map is developed as shown in Fig. 4-4. Based on this map, annual basin rainfall in the Kathmandu Valley is estimated at about 1,900 mm.

The monthly rainfall variation indicates that some 80 % of the annual rainfall occurs during the rainy season from June to September or about 90 % of in the period from May to October. The wettest months are July and August, while the driest month is November. In July and August, 20 to 25 days are rainy, while 0 to 3 days are rainy in dry season. The mean monthly rainy days are shown in Table 4-6. The maximum daily rainfall also occurs in July or August, which is occasionally observed at more than 100 mm in the valley bottom while over 150 mm in the mountain area.

2.3 Other Meteorological Condition

The meteorological conditions at Kathmandu Airport other than the rainfall are summarised in following table and shown in Fig. 4-5 together with the data at Khumaltar and Nagarkot climatological stations.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Air Temperature(°C)	9.9	11.7	15.6	19.2	21.6	23.6	23.8	23.8	22.5	19.3	14.8	10.9	18.1
Relative Humidity (%)	80	74	64	60	67	75	82	82	83	82	82	82	76
Pan evaporation (mm/day)	2.4	3.0	4.1	5.0	5.0	4.7	4.5	4.6	3.7	3.3	2.6	1.9	3.7
Sunshine hour (hrs/day)	7.0	7.3	8.1	7.7	8.0	5.8	4.2	5.4	5.5	7.1	7.4	6.7	6.7
Wind speed (km/hr)	2.5	3.4	4.4	5.0	4.8	4.1	3.8	3.0	2.6	1.9	1.8	1.6	3.2

(1) Air Temperature

At five stations in the study area i.e. Kathmandu Airport, Indian embassy, Khumaltar, Godawari and Nagarkot stations, data of air temperature is available which are daily mean, daily maximum, daily minimum, dry bulb and wet bulb temperature.

The air temperature in the Kathmandu valley is influenced by the monsoons. The mean monthly, mean monthly maximum and minimum, monthly absolute maximum, and monthly absolute minimum air temperature are shown in Tables 4-7, 4-8, 4-9, 4-10 and 4-11, respectively. At Kathmandu Airport station, mean air temperature is 18°C. From December to February, weather is cool with a mean temperature about 11°C. March to November is warm season having a mean temperature about 23°C. The hottest months are July and August, in which maximum temperature is rising up over 30°C. The coldest month is January and temperature rarely falls under 0°C.

The air temperature is substantially according to the altitude. The temperature, in general, decreases in the mountainous area. At Nagarkot town, of which elevation is around 2,000 m, it is about 2 to 5°C lower than in the lowlands of the valley.

(2) Relative Humidity

Daily relative humidity is available at three stations. Average of daily relative humidity observed at 8:40 and 17:40 are adopted to the daily relative humidity. Monthly relative humidity at three stations are shown in Table 4-12. The average relative humidity at Kathmandu Airport station is about 76 % and varies from about 60 % in the dry season to about 82 % in the rainy season. The lowest relative humidity occurs in April, while the highest in July to September. The relative humidity in the valley is also subject to the influence of the said monsoon and its seasonal variation is comfirmable to rainfall pattern.

(3) Pan Evaporation

The data of evaporation is observed with class-A pan at some stations in the valley. These data are given in daily averages instead of monthly totals because of the relatively high percentage of missing data. The evaporation usually varies day by day under the influence of air temperature, relative humidity and rainfall, etc. The mean daily evaporation rate varies from 1.9 to 5.0 mm/day, and averages at 3.7 mm/day at Kathmandu Airport station. The highest evaporation occurs in April and May, while the lowest in December. Monthly values of pan-evaporation observed at three stations are tabulated in Table 4-13.

(4) Sunshine Hours

Annual mean daily sunshine hours is 6.7 hours, varying from 4.2 hrs/day in July to 8.1 hrs/day in March at Kathmandu Airport. The sunshine hours in the hilly area is shorter than in the low area. The value of the mean daily sunshine hour is around 4.7 hours at Kakani station. Table 4-14 shows sunshine hours at respective stations.

(5) Wind Speed

Mean wind speed is 3.2 km/hr (0.9 m/sec), varying from 1.6 km/hr (0.4 m/sec) in December to 5.0 km/hr (1.4 m/sec) in April at Kathmandu Airport station. The wind speed is also substantially according to the altitude, which increases in the mountainous area where it is about 5.5 km/hr (1.5 m/sec) at the Kakani station. The monthly mean wind speed are shown in Table 4-15.

3. HYDROLOGY

3.1 River System

In the Kathmandu Valley, there is only one river system, the Bagmati with its tributaries with a drainage area of 585 km^2 at Chobhar gauging station located close to the outlet of the valley. The Bagmati river has its origin in Sivpuri Lekh on the northern border of the Kathmandu Valley about 15 km north-east of Kathmandu city. This river runs in a southern or western direction from its origin and it leaves the Kathmandu Valley almost 35 km from its origin, dissecting the mountain range at the valley outlet and flows through the Mahabarat range and the Terai plain, and then finally joins the Ganges river in Indian territory.

The major tributaries of the Bagmati river are the Mai, the Nakhu, the Balkhu, the Bisnumati, the Dhobi, the Manohara, the Kotkhu, the Godawari Kholas (Khola means small perennial river in Nepalese and is abbreviated as Kh.), and the Hanumante river in order from the mouth. All these tributaries originating in the mountain side near the border of the valley run toward to the centre of the valley and finally drop into the Bagmati river. The catchment area of each tributaries at the junction and the potential rehabilitation schemes in these river basin are summarised below.

River	Catchment area	Potential scheme (Code No. see Annex-3)
Bisnumati Kh.	103.4 km^2	AK-01, AK-06, AK-13, AK-27
Dhobi Kh.	28.9 km^2	-
Manohara Kh.	73.1 km^2	AK-04, AK-10, AK-14, AK-25, AB-17
Hanumante river	91.2 km^2	AB-01, AB-02, AB-03, AB-04, AB-07, AB-08, AB-10, AB-12, AB-13, AB-14, AB-18, AB-20, AL-13
Godawari Kh.	45.1 km^2	AL-05
Kotkhu Kh.	34.6 km^2	AL-10
Nakhu Kh.	57.2 km^2	AL-02, AL-03, AL-08, AL-18, AL-19, AL-20
Balkhu Kh.	43.0 km^2	AK-02, AK-03
Bagmati river	585.0 km^2	AK-05, AK-07, AK-09, AK-12, AK-24, AK-26

In the Kathmandu Valley, there are many springs. The major springs exist in the Phulchauki - Chardragiri range, and springs in the Nagarjun - Naichal range are minor. They are situated at the feet of mountain range and utilised for drinking water supply and/or irrigation. Some of these springs are also important religious places.

3.2 Runoff Characteristics

There are several hydrological stations within the valley registered in DoHM, but the data are generally interrupted or some of stations were closed already. Daily discharge data at seven stations; Sundarijal, Gauri Ghat, Budhanilkantha, Mahankal, Shyamdado, Thika

Bhairaw and Chobhar stations are obtained. The monthly discharge at these stations are shown in Table 4-16 and summarised as follows:

Unit : m^3/sec

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Sundarijal	(Bagmati river, Stn. No. 505, Catchment area : 16.5 km^2)												
	0.30	0.24	0.21	0.22	0.28	0.81	2.36	3.39	2.68	1.19	0.60	0.41	1.06
Mahankal	(Bagmati river, Stn. No. 507, Catchment area : 13.7 km^2)												
	0.31	0.21	0.20	0.18	0.23	1.02	2.70	3.84	2.34	1.12	0.68	0.52	1.11
Shyamdado	(Sialmati river, Stn. No. 510, Catchment area : 3.34 km^2)												
	0.06	0.05	0.04	0.03	0.03	0.22	0.47	0.81	0.46	0.30	0.21	0.10	0.23
Gauri Ghat	(Bagmati river, Stn. No. 530, Catchment area : 67.8 km^2)												
	0.87	0.56	0.49	0.50	0.50	3.22	7.40	10.72	5.65	3.19	1.91	1.22	3.02
Budhanilkantha	(Bisnumati Khola, Stn. No. 536.2, Catchment area : 4.43 km^2)												
	0.05	0.04	0.04	0.04	0.07	0.25	0.71	0.92	0.80	0.39	0.17	0.08	0.30
Thika Bhairaw	(Nakhu Khola, Stn. No. 540, Catchment area : 42.5 km^2)												
	0.20	0.16	0.17	0.15	0.15	1.11	3.12	3.97	2.38	1.11	0.44	0.26	1.10
Chobhar	(Bagmati river, Stn. No. 550, Catchment area : 585 km^2)												
	2.48	1.89	1.44	1.73	2.49	15.50	47.30	53.87	35.39	16.73	7.00	3.88	15.81

Mean monthly discharge at respective stations is illustrated on Fig. 4-6.

Annual total runoff of the Bagmati river at the outlet of the valley (Chobhar station) is estimated at about 500 MCM. Since a number of water users abstract a certain amount of river water in the valley, the runoff coefficient is estimated at 45 % at the Chobhar station. Based on the runoff data at Sundarijal station where there is natural runoff, the mean annual runoff is 1.06 m^3/sec and the runoff coefficient is estimated at 67 %. Mean monthly specific discharge at Sundarijal and Chobhar are as below.

Unit : m^3/sec/100km^2

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Sundarijal (Stn. No. 505, Catchment area : 16.5 km^2)													
	1.83	1.45	1.26	1.31	1.70	4.89	14.27	20.53	16.24	7.18	3.62	2.48	6.44
Chobhar (Stn. No. 550, Catchment area : 585 km^2)													
	0.42	0.32	0.25	0.30	0.43	2.65	8.09	9.21	6.05	2.86	1.20	0.66	2.70

3.3 Flood

In the valley, the rainfall is heavy in the monsoon season and flood occurs within a short time due to the steep slope of the rivers in the mountain region. The Bagmati river and its tributaries tend to frequent change the river course by every flood. Some portions at the existing weir sites are severely eroded and scoured by the flood. In addition, the flood sometimes makes a part of farm land submerged and flashes away the temporary bond of small farmers' irrigation systems. The maximum floods are mostly occurs in July or August as seen in the Table 4-17.

Purpose of flood analysis in this study is to estimate the design flood discharge for the preliminary design of rehabilitation of irrigation facilities. Since there is no flood record at each intake site of potential schemes, the probable flood is estimated based on the flood record at the gauging stations in the valley. For the estimation of the probable flood at ungauged site, it is generally conceivable to make use of the relationship between the flood discharge and the catchment area. Based on the flood record at five gauged stations, probable flood discharges of 1/10 and 1/50 recurrence were estimated by means of Gumbel method and plotted against the catchment area as shown in Fig. 4-7. Applying this result, which shows the mostly linear line,

the probable design flood at intake points of potential schemes are preliminary estimated. The results are is shown in the Table 4-18.

3.4 Water Quality and Sedimentation

(1) Water quality

Generally, water quality of the rivers at the intake points of the irrigation schemes is sufficiently suitable for the cultivation. However, water pollution has been observed in the urbanised area particularly in the lower reaches of the Bagmati river due to the sewerage water from the Kathmandu city. During the field survey, water quality in situ was examined in relation to dissolved Oxygen (DO), pH, electric conductivity (EC), NaCl density and turbidity at intakes of the selected schemes. The results are shown in the following table, which indicates the values are within the permissible ranges.

Scheme		Date	Water Temp. (°C)	DO (mg/l)	pH	EC (mS/cm)	NaCl (%)	Turbidity (mg/l)
AK-06	Gokarna	(25 Jul., 1993)	23.6	5.9	6.7	0.4	0.01	34
AK-11	Indrayani	(25 Jul., 1993)						
AK-14	Shali Nadi	(26 Jul., 1993)	24.1	6.0	6.9	0.4	0.01	24
AB-01	Mahadev Kh.	(29 Jul., 1993)	23.5	7.0	7.7	3.4	0.17	113
AB-02	Katunje	(29 Jul., 1993)	23.9	6.2	7.5	4.5	0.23	280
AB-10	Dunge Dhara	(26 Jul., 1993)	25.7	5.7	7.4	0.6	0.02	24
AL-19	Thika Bhairaw							
	(Lele intake)	(27 Jul., 1993)	21.7	5.8	7.6	3.4	0.17	150
	(Nallu intake)	(27 Jul., 1993)	21.6	6.4	7.6	2.1	0.10	130

(2) Sedimentation

The rivers in the study area generally transport high sediment load due to the deforested land, steep slope in the mountain range and high rainfall intensity in the rainy season. Water of the Bagmati river and tributaries seems to be clear in the dry season, while it becomes muddy in the rainy season due to a large quantity of sediment transports from the upstream basin. Sampling of suspended sediment was done by DoHM at Chobhar station during period from August, 1966 to July, 1978. Using these data, the relationship between sediment flux and discharge was developed in the previous report (Ref. 28) as is seen in Fig. 4-8.

$$Q_s = 0.00398\ Q^{2.003}$$

where, Q_s : Suspend sediment load (ton/day)
Q : Discharge (m^3/sec)

4. WATER USES IN THE VALLEY

4.1 General

Water uses in the Valley is related to the several kinds of activities like irrigation, drinking water supply, hydropower generation, industry and other domestic purposes. For an assessment of available water for the rehabilitation schemes and the effective use of limited water resources, consideration should be given to the present condition and future plan of such water uses.

4.2 Irrigation

In the Kathmandu valley, there exist a number of irrigation systems abstracting a certain amount of water from the rivers, which are not only Government developed schemes objected in this study but also ISP projects and small farmers' built and managed systems.

Regarding framers' built and managed irrigation systems, generally, they consist of small-scaled temporary diversion bond made with simple stone piling and small farm ditches without lining and the permanent structures. When the diversion bonds are washed away by the flood, they are reconstructed by farmers themselves. In most systems, irrigation is made for supplementing to the rainfall mainly in the transplanting period or drought period in the rainy season. Irrigation area in dry season are remarkably small compared to the rainy season or no water is supplied in this season due to the less availability of the river water.

The summary list of the irrigation systems in the valley are shown in Table 4-19, and their intake points are plotted in Fig. 4-9.

4.3 Water Supply

(1) Municipal water supply

In the Kathmandu valley, the first priority of water resources development is given to the municipal water supply of Greater Kathmandu (Kathmandu and Lalitpur municipalities). The municipal water supply system are managed by Nepal Water Supply Corporation (NWSC) under the Ministry of Housing and Physical Planning (MoHPP). At present, water supply systems in the valley, which are taking both surface water and groundwater resources, are composed of eleven systems for Greater Kathmandu and Bhaktapur. The amount of water supplied to the valley is reported by the NWSC at 61 million litter per day (MLD) by the surface sources and 30 MLD by groundwater sources.

In the valley, the water supply systems are overloaded because of high population pressure. The master plan studies on water supply recommended the development of surface water resources within the valley by construction of the run-of-river (ROR) type intakes (Ref. 28) and the new water supply systems from water resources outside the valley (Ref. 29). In line with this plan, NWSC is now implementing the construction of new ROR type intakes on the Bisnumati Khola.

As the alternative of said development, the master plan study also recommended the storage reservoir schemes of the Kotkhu and the Nakhu Kholas, out of which Kotkhu Khola dam scheme are now under feasibility study carried out with a technical assistance of the Thai Government. According to the result of their feasibility study, the principal features of the proposed dam are preliminarily designed as follows.

Dam type	:	Homogeneous earthfill type
Dam height	:	38.0 m (Crest El.1,393 m)
Surface water level	:	El.1,388 m
Gross storage capacity	:	4.5 MCM
Effective storage capacity	:	4.0 MCM
Design water supply capacity	:	18 MLD

Although, the irrigation water requirements for the existing schemes are considered in these studies, the detailed arrangement of the share of water is necessary both for drinking water supply and irrigation, especially on the Kotkhu and the Nakhu dam schemes where the potential rehabilitation schemes will be carried out. On the other hands, water supply plans to the Grate Kathmandu from outside the valley were studied under the technical assistance by the world bank, and NWSC put priority on the Rosi Khola Scheme and the Melamchi Diversion Scheme after Kotkhu Khola Dam scheme.

The list of municipal water supply is shown in Table 4-20 and location of the intakes for the drinking water supply including on-going and planned schemes are shown on Fig. 4-9.

(2) Rural water supply

Water supply in the rural area is the responsibility of the Department of the Water Supply and Sewerage (DoWSS), MoHPP. The sources of these water supply are generally small streams in the hilly area or springs. Although their design capacities are small, some 0.1 to 10 l/sec, they don't seem to affect the water availability for irrigation, with some exceptions at the intakes where drinking water and irrigation water are taken at the same place. The summary of the rural water supply is also shown in Table 4-20.

4.4 Other Water Uses

There exist only one hydropower generation station at Sundarijal, with a small reservoir, which started the operation in 1934. There was another hydropower station at Pharping, but it was closed. The capacity of power plant in Sundarijal station is 640 kW/h and the tail water is utilised for the drinking water supply of Greater Kathmandu. The source of water is the Bagmati river with a catchment area of 17 km^2 supplemented by the Nagmati river through the weir and conveyance channel. In the dry season, since all river water both in the Bagmati and the Nagmati river are stored in the reservoir, no water is expected to be released from this river basins.

The major industries which use water are the dyeing factory, brick factory, and some agro-industrial factories. Mostly they use water of small streams in the hilly area by lifting-up with small pumps continually, while they use groundwater in the low area in the valley. Water abstraction is not so great and they mostly locate some distance from the irrigation intakes.

5. WATER RESOURCES ASSESSMENT FOR SELECTED IRRIGATION SCHEMES

5.1 General

The water sources of the potential schemes are the Bagmati river and its tributaries. At the intake points of the schemes, no continual and systematic discharge observation has been executed, while only some spot measurements have been done with a current meter or floating devices at limited points. Referring these results, the river discharges at intakes are estimated preliminary by means of the water balance study in which water demand and supply are simulated. In order to confirm the estimated values, the JICA team conducted actual discharge measurements at selected points and interview survey to the respective farmers and/or irrigation operator (Dhalpa) of the schemes stationed at intake sites both in the rainy and the dry seasons. The information relating to the river discharge of potential rehabilitation schemes are summarised in the water resources inventory in Table 4-21.

5.2 Estimate of the Natural Runoff

Natural runoff in the respective river basins at intake site of the selected schemes are estimated based on the specific discharge in the neighbouring sub-basin in the valley, as described below.

i) Specific discharge

The specific discharges for respective river basin were calculated from the discharge data at Sundarijal, Mahankal, Shyamdado, Gauri Ghat, Budhanilkantha, Thika Bhairaw

and Chobhar stations as shown in Table 4-22. From the correlativity between specific discharges or respective stations of which correlation factors are shown in Table 4-23, unobserved monthly specific discharge at respective stations was reconstituted, and the result are shown in Table 4-24.

ii) Catchment area of each sub-basin of selected scheme

The river basin of the Bagmati and its tributaries are divided into sub-basins of the catchment area of each selected scheme at their intake points and the area of catchment are measured with planimeter on the 1 to 10,000 scaled topo-maps. The catchment area of each scheme is shown in Table 4-21 and Fig.4-10.

iii) Annual basin rainfall

With use of the isohyetal map shown on Fig.4-4, annual basin rainfall are determined for each catchment area at intake points as shown in Table 4-21.

vi) Natural runoff for each scheme

On an assumption that river discharge is proportional to catchment area and basin rainfall, the natural runoff at ungauged intake point of the schemes are estimated on monthly basis applying following equation.

$$Q_i = 100 \times q_s \times A_i \, (R_i / R_s) \pm a$$

where, Q_i : Natural runoff of at the intake points (ungauged basin) (m^3/sec)
q_s : Specific discharge at the gauged basin (m^3/sec/100km^2) $= Q_s/A_s/100$
Q_s : Natural runoff of the gauged basin (m^3/sec)
A_s : Catchment area of the gauged basin (km^2)
A_i : Catchment area of ungauged basin (km^2)
R_i : Annual basin rainfall in ungauged basin (mm/yr)
R_s : Annual basin rainfall in the gauged basin (mm/yr)
a : Adjustment for supply from permanent spring, withdraw for other purpose or fixed water right, etc. (m^3/sec)

Natural runoff estimated for respective intake sites of the selected schemes are shown in Table 4-25.

5.3 Preliminary Assessment of Available Water

The water availability is preliminary estimated taking into consideration the amount of upstream water abstraction, irrigation and drinking water supply, and return flow. The water balance model with the basin map of each river basin are shown in Fig. 4-11. A preliminary assessment of water resources both in the rainy and dry seasons for the selected schemes was carried out based on the comparison between the available water and irrigation water requirement for the proposed cropping pattern. The water balance study was carried out applying the following assumptions.

1) The irrigation water abstraction figure is taken as the calculated irrigation water requirement for present cropping pattern prevailing in the valley due to the lack of data on the actual abstraction at the respective intake points. For this water balance study, the irrigation area of the potential schemes is taken as the preliminarily proposed area and that of the other systems is based on the previous study on the water resource inventory carried out under Water and Energy Commission Secretariate (WECS). If the level of river flow is less than the calculated requirement, the abstraction figure is taken as the level equal to river flow. Return flow is assumed as 30 % of the diverted water for the upstream irrigation system.

2) The irrigation water requirement is estimated based on preliminarily proposed cropping pattern for Phase-I study. However, if a water shortage occurs during the puddling stage in this water balance study, the alternative pattern, in which the start of puddling can be delayed by a maximum of one month, is allowed.

3) The balance of available water and required water is compared on a monthly basis with the mean monthly discharge and 80% dependable discharge. For the project evaluation, the comparison with the mean discharge is adopted.

As a result of preliminary assessment on the available water for the selected irrigation schemes, irrigable area of respective schemes is as follows.

Code	Scheme	Proposed Net Irrigation Area (ha)	Irrigable Area (ha)			
			Mean Discharge		80% Reliable Discharge	
			Rainy S	Dry S.(%.)	Rainy S	Dry S.(%.)
AK-04	Biswambhara	100	100	57 (57 %)	100	47 (47 %)
AK-05	Boshan	168	168	168 (100 %)	168	168 (100 %)
AK-07	Dakshinkali	80	80	80 (100 %)	80	80 (100 %)
AK-14	Indrayani	112	112	112 (100 %)	112	112 (100 %)
AK-25	Shali Nadi	240	240	240 (100 %)	240	240 (100 %)
AK-27	Tokha	120	72	10 (14 %)	38	10 (14 %)
AB-02	Bidol	48	48	48 (100 %)	48	48 (100 %)
AB-04	Dhunge Dhara	168	168	20 (12 %)	168	16 (10 %)
AB-10	Katunje	72	72	38 (53 %)	72	28 (39 %)
AB-12	Kutudhal	118	118	49 (42 %)	118	13 (11 %)
AB-14	Mahadev Khola	360	360	213 (59 %)	360	165 (46 %)
AL-08	Khokana	200	200	200 (100 %)	200	103 (52 %)
AL-10	Kotkhu	356	356	356 (100 %)	356	223 (63 %)
AL-13	Lubhu	132	132	132 (100 %)	132	94 (71 %)
AL-19	Thika Bhairaw(I)	480	480	480 (100 %)	480	480 (100 %)
AL-20	Thika Bhairaw(II)	320	320	320 (100 %)	320	206 (71 %)

As is seen in the above table, the following may noted from the viewpoint of water resources.

1) Generally speaking, water is sufficient in the rainy season to cover the proposed area of 15 of the 16 selected schemes, but not the Tokha scheme (AK-27), while the irrigable areas in the dry season is limited in 6 schemes, especially Dhunge Dhara (AB-04), Kutudhal (AB-12) and followed by Katunje (AB-10), Mahadev Khola (AB-14), and Biswambhara (AK-04), due to the lower availability of water.

2) It is necessary for Khokana (AL-08), Thika Bhairaw-I (AL-19) and Thika Bhairaw-II (AL-20) schemes, that they share the same water source with the other potential schemes; Bhore (AL-02), Champi (AL-03), and Saibu (AL-18), because these schemes are situated in a series depending upon the same water source, the Nakhu Khola, with a small residual catchment area in the lower reaches of this river.

5.4 Available Water for Selected Irrigation Schemes

Following the same prosedure mentioned avobe, The water availability is estimated taking into consideration the monthly natural runoff estimated for 24 years and irrigation water requirement for the proposed cropping pattern with applying following assumptions.

1) The irrigation water abstraction is taken as calculated irrigation water requirement for present cropping pattern prevailing in the valley.

2) Irrigation areas of each selected model scheme for the Phase-II Study were reviewed on the detailed topographic map of a scale of 1/5,000 which prepared for the Study, and

Some of them were changed as described in Annex-2 and Chapter 3 of Part-B of the Main Text.

3) The irrigation water requirement for selected model schemes is estimated based on the proposed cropping pattern. Irrigation areas of each selected model scheme for the Phase-II Study were reviewed on the detailed topographic map of a scale of 1/5,000 which prepared for the Study, and Some of them were changed as described in Annex-2 and Chapter 3 of Part-B of the Main Text.

4) Water balance of available water and requirement are compared on monthly basis as shown in Table 4-26.

Table 4-27 shows the result of estimated available water for the selected irrigation schemes.

List of References (1/2)

1. Climatological Record of Nepal, 1971 - 1975, Volume I	Jun, 1977	Department of Irrigation, Hydrology and Meteorology
2. Climatological Record of Nepal, 1976 - 1980, Volume I	Dec, 1982	Department of Irrigation, Hydrology and Meteorology
3. Climatological Record of Nepal, 1981 & 1982, Volume I	Jul., 1984	Department of Irrigation, Hydrology and Meteorology
4. Climatological Record of Nepal, 1983 & 1984, Volume I	Sep., 1986	Department of Irrigation, Hydrology and Meteorology
5. Climatological Record of Nepal, 1985 - 1986	Feb., 1988	Department of Hydrology and Meteorology
6. Climatological Record of Nepal Supplemental Data, Volume II, 1976 - 1984	Nov., 1986	Department of Irrigation, Hydrology and Meteorology
7. Climatological Record of Nepal, Special Supplement Kathmandu Valley Volume II, 1921 - 1975	Jun, 1977	Department of Irrigation, Hydrology and Meteorology
8. Precipitation Records of Nepal, 1987 - 1990	Jul., 1992	Department of Hydrology and Meteorology
9. Surface Water Records of Nepal Supplement No. 1 - 11		Department of Irrigation, Hydrology and Meteorology
10. Hydrological Records of Nepal - Stream Flow Summary - Updated Version	Jun, 1988	Department of Hydrology and Meteorology
11. Mean Monthly Surface Water Records of Nepal	1988	Water and Energy Commission Secretariat
12. Hydrological Studies of Nepal	Mar, 1982	Water and Energy Commission
13. Design Manuals for Irrigation Projects in Nepal M.3 Hydrology and Agro-meteorology Manual	Feb., 1990	Department of Irrigation, Sir M MacDonald & Partners Ltd & associates
14. Meteorologies for Estimating Hydrologic Characteristics of Ungauged Location in Nepal	Jul., 1990	Water and Energy Commission Secretariat & Department of Hydrology and Meteorology
15. Erosion and Sedimentation in the Nepal Himalaya, an Assessment of River Processes	May, 1987	Water and Energy Commission Secretariat
16. Water Resources Inventory Study, Kathmandu District	1992	Water and Energy Commission Secretariat
17. Water Resources Inventory Study, Lalitpur District	1988	Water and Energy Commission Secretariat, Cemat Consultants (Pvt.) Ltd.
18. Water Resources Inventory Study, Bhaktapur District	1988	Water and Energy Commission Secretariat Cemat Consultants (Pvt.) Ltd.
19. Land Resource Mapping Project, Water Resources Report	1984	Kenting Earth Sciences Limited
20. Nationwide Hydro-Meteorological Data Management Project	1993	Department of Hydrology and Meteorology, Japan International Cooperation Agency
21. River System of Nepal	Jul., 1977	C. K. Sharma, Sanguta Sharma
22. Irrigation Development in Nepal	1986	Som Nath Poudel

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23. Master Plan for Irrigation Development in Nepal, Cycle 2	1990	Department of Irrigation, Canadian International Water and Energy Consultants
24. Feasibility Study on Water Supply and Sewerage,	1987	World Bank
25. Water Supply for Kathmandu - Lalitpur from outside the Valley, Prefeasibility Study	Aug., 1988	Water Supply and Sewerage Corporation, Binnie and Partners & Associates
26. Greater Kathmandu Drainage Master Plan Studies, Final Report	Sep., 1990	Department of Water Supply & Sewerage, Snowy Mountains Engineering Corporation & Associates
27. Service Improvements in Kathmandu, Lalitpur and Bhaktapur and Management Support to WSSC, The Fifteen Years Comprehensive Development Programme and Detailed Phase I (1991 - 1995)	Jan., 1990	Water Supply and Sewerage Corporation, Binnie and Partners & Associates
28. Groundwater Management Project in the Kathmandu Valley	Nov., 1990	Water Supply and Sewerage Corporation, Japan International Cooperation Agency
29. The Greater Kathmandu Water Supply Project	Nov., 1992	Nepal Water Supply Corporation, Snowy Mountains Engineering Corporation Limited & associates
30. Kathmandu Valley Urban Development Plans and Programmes	Sep., 1990	Department of Housing and Urban Development, Harcrow Fox & Associates
31. Basic Design Study Report on the Project for Kathmandu Water Supply Facility Improvement	Jul., 1991	Japan International Cooperation Agency
32. Kodkhu Water Supply Project, Inception Report	May, 1993	Nepal Water Supply Corporation, Provincial Waterworks Authority, Thailand
33. Bagmati Multipurpose Project, Phase 1, Annex 3 - Hydrology	Dec,1980	Departments of Electricity, Irrigation and Agriculture, German Agency for Technical Cooperation
34. Feasibility Study on Bagmati Command Area Development Project	Mar, 1992	Department of Irrigation Nippon Koei Co., Ltd. and associates
35. Kodkhu Water Supply Project, Feasibility Study Report (Final Report)	Dec., 1993	Nepal Water Supply Corporation, Provincial Waterworks Authority, Thailand

Tables

Table 4-1 List of Rainfall Gaiging Stations

No.	Station Name	Zone	District	Latitude	Longitude	Altitude (m)	Established Date	Closed Date	Remarks
0915	Markhu Gaun	Narayani	Makwanpur	27° 37'	85° 09'	1,530	Dec-71		
1007	Kakani	Bagmati	Nuwakot	27° 48'	85° 15'	2,064	Jan-62		
1010	Lalitpur(Kopundole)	Bagmati	Lalitpur	27° 41'	85° 20'	1,303	Jun-65	Sep-68	
1011	Kathmandu(USAID)	Bagmati	Kathmandu	27° 42'	85° 20'	1,335	Jan-54	Feb-69	
1012	Sundarijal(Power House)	Bagmati	Kathmandu	27° 45'	85° 25'	1,364	May-40	Jun-78	
1013	Sundarijal (Water Res.)	Bagmati	Kathmandu	27° 47'	85° 26'	1,576	May-40	Apr-78	
1014	Kathmandu(Indian Embasy)	Bagmati	Kathmandu	27° 44'	85° 20'	1,324	Jan-21		Unpub. 1981
1015	Thankot	Bagmati	Kathmandu	27° 41'	85° 12'	1,630	Sep-66		
1021	Kirtipur (Bagbani)	Bagmati	Kathmandu	27° 41'	85° 18'	1,364	Jul-63	Feb-68	
1022	Godavari	Bagmati	Lalitpur	27° 35'	85° 24'	1,400	May-52		
1024	Dhulikhel	Bagmati	Kabhre	27° 37'	85° 33'	1,552			
1029	Khumaltar	Bagmati	Lalitpur	27° 40'	85° 20'	1,350	May-67		
1030	Kathmandu Airport	Bagmati	Kathmandu	27° 42'	85° 22'	1,336	Jan-49		
1035	Sankhu	Bagmati	Kathmandu	27° 44'	85° 28'	1,463	Sep-70		
1039	Panipokhari(Kathmandu)	Bagmati	Kathmandu	27° 44'	85° 21'	1,335	Apr-71		
1040	Tika Bhairav	Bagmati	Lalitpur	27° 34'	85° 19'	1,524			
1041	Gokarna	Bagmati	Kathmandu	27° 44'	85° 24'	1,400			
1042	Khodkhu Khola	Bagmati	Lalitpur	27° 36'	85° 21'	1,445			
1043	Nagarkot	Bagmati	Bhaktapur	27° 42'	85° 31'		May-71		
1044	Birdhara	Bagmati	Kathmandu	27° 47'	85° 25'				
1045	Kathmandu(Lal Darbar)	Bagmati	Kathmandu	27° 44'	85° 21'	1,330			
1046	Phutung	Bagmati	Kathmandu	27° 46'	85° 19'	1,390			
1047	Pharping	Bagmati	Kathmandu	27° 37'	85° 18'	1,500	May-71	Aug-72	
1048	Panchmane	Bagmati	Kathmandu	27° 47'	85° 19'	1,710			
1050	Mahadev Khola	Bagmati	Bhakutapur	27° 38'	85° 26'	1,420			
1051	Budhanilkantha	Bagmati	Kathmandu	27° 47'	85° 26'	1,350			
1052	Bhaktapur	Bagmati	Bhakutapur	27° 44'	85° 25'	1,330	May-71		
1056	Tokha	Bagmati	Kathmandu	27° 48'	85° 26'		Dec-72	May-81	
1059	Changu Narayan	Bagmati	Bhakutapur	27° 45'	85° 25'	1,543			
1060	Chapa Gaun	Bagmati	Lalitpur	27° 36'	85° 20'	1,448			
1061	Lubhu	Bagmati	Lalitpur	27° 39'	85° 23'	1,341			
1071	Budhanilkantha	Bagmati	Kathmandu	27° 47'	85° 26'				

Table 4-2 List of Streamflow Gauging Stations

St. No	Name of Site	Latitude		Longitude		Elevation (m)	Catchment Area(km2)	Start of Record	End of Record
505	Sundarijal	27°	46' 30"	85°	25' 40"	1,600	17	07/12/62	
507	Mahankal	27°	46' 20"	85°	26' 10"	1,660	13.7	-/11/63	
510	Shyamdado	27°	25' 10"	85°	25' 10"	1,690	3.34	-/11/63	
530	Gauri Ghat	27°	42' 30"	85°	21' 00"	1,300	67.8	15/11/64	
536	Budhanilkantha	27°	46' 49"	85°	21' 32"	1,454	4.43	27/05/68	
540	Tika Bhairaw	27°	34' 30"	85°	18' 50"	1,400	42.5	23/11/62	18/04/88
550	Chobar	27°	39' 40"	85°	17' 50"	1,280	585	01/07/62	Omitted

Table 4-3 Annual Rainfall at Respective Rainfall Gauging Stations

Unit : mm

Year	0915 Marichu Gaun	1007 Kakani	1012 Sundarijal (p.house)	1013 Sundarijal (water res.)	1014 Indian Embassy	1015 Thankot	1022 Godawari	1024 Dhulikhel	1029 khumaltar	1030 Kathmandu Airport	1035 Sankhu	1039 Pani-pokhari	1043 Nagarkot	1047 Pharping	1052 Bhaktapur	1056 Tokha	1059 Changu Narayan	1060 Chapa gaun	1061 Libbu	1071 Budhanil-kantha
1941			1,971	2,525																
1942			2,317	2,809																
1943			2,248	3,010																
1944			2,221	2,425																
1945			2,348	2,909																
1946			2,682	3,260																
1947																				
1948			2,755	3,126	1,793			1,440												
1949			2,446	2,478	1,369			1,595												
1950			2,407	1,440	1,536															
1951			2,038	1,692	1,224															
1952			1,968	2,302	1,280			2,313												
1953			2,007	2,225	1,364		1,764	1,509												
1954			2,525	2,553	1,594		2,084	2,213												
1955					1,131		2,064	1,250												
1956			2,456	2,309	1,776		2,394	1,830												
1957			1,641	1,512	1,001		1,398	972												
1958					1,134		1,456	1,131												
1959			2,033	1,995	1,195		1,633	1,354												
1960			1,393	1,692	1,202		1,766	1,299												
1961			1,675	1,947	1,705			1,326												
1962		3,501	2,483	2,367	1,262		2,337	1,537												
1963		3,069	2,112	2,263	1,314			1,279												
1964		2,959	1,762	1,904	1,385			1,379												
1965		1,791	1,450	1,649	1,334			1,511												
1966			1,656	1,729	1,224			1,405												
1967			1,992	2,062	1,349			1,291												
1968				2,445	1,539			1,819	1,335	1,380										
1969				1,929	1,131	1,189		1,032	922	1,179										
1970				2,268	1,440	1,590		1,572	1,233	1,362										
1971				2,383	1,682	1,811	1,993	1,535	1,364	1,511	2,335									
1972	1,474	2,988		1,779	1,510	1,852	1,927	1,599	1,197	1,261	1,942		1,641	1,286	1,466					
1973	1,865	3,119			1,969	2,633	2,430	2,115	1,422	1,800	2,133		3,644	973		2,917				
1974	1,829			2,007	1,113	2,207	2,094	1,661		1,225	1,850	1,125	1,915	1,639	1,433	2,007				
1975	1,865	2,956		2,541	1,527	2,092	2,134	1,720	1,428	1,425	2,092	1,494	2,025	1,858	1,445	3,293	1,645			
1976	1,706	2,653	2,213	2,333		2,643	1,982	1,603	1,089	1,491	1,853	1,409	2,126	1,200	1,537	1,485	1,795	1,379	1,546	
1977	1,370	2,393	1,695	1,900		2,288	1,618	1,419	1,144	1,297	1,354	1,562	1,809	448	1,282	1,174	1,431	1,278	1,258	
1978	1,694	3,218				2,911	2,210	1,857	1,698	1,556	3,425	1,790	2,708	1,170	1,913	1,454	2,044	1,672	1,629	
1979	1,094	1,740				2,641	1,584	1,362	960	1,356	2,013	1,289	1,697	690	1,211	1,441	1,148	1,098	1,119	
1980	1,311	2,842				2,216	1,766	1,263	970	1,341	2,098	1,583	1,783	724	1,275	1,701	1,260	1,404	1,177	
1981	1,028	2,374				1,344	1,698	1,323	1,159	1,371	965		1,066		1,258		1,282	1,365	1,244	
1982	1,115					918	1,670	1,322	1,160	1,169	1,949	1,145	1,047		1,082		1,528	1,211	1,089	
1983	1,461	2,985				1,564	1,917	1,438	1,309	1,450	2,525	1,585	1,264		2,381		1,989	1,382	1,064	
1984	1,497	2,670				1,949	2,212	1,539	1,329	1,314	1,997	1,774	1,433		1,793		1,820	1,503	1,490	
1985	1,928	3,287				2,637	2,553	2,345	1,533	1,785	2,079	1,858			2,107		2,456	1,900	1,722	
1986	1,758	3,053				2,500	1,909		1,365	1,494	1,694	1,767	2,088		1,881		1,725	1,719		
1987	1,503	2,322				2,254	2,061	1,452	1,449	1,395	1,728	1,458	1,645		1,485		1,519	1,687		
1988	1,345	2,775				2,024	1,974	1,636	1,497	1,441	1,906		1,581		1,785		1,730	1,517		
1989	1,143	3,162				2,030	1,603		996	1,132	2,117				1,095		1,533	1,200		
1990	1,455	2,994				2,112	2,087		1,174	1,536	2,373		2,132		1,753		2,000	1,570		2,409
1991	1,017	2,690				1,620	1,509		870	998	1,439	1,361	1,742		905		1,283	1,232		1,448
1992	983					1,594	1,577		819	1,101	1,881				1,093		1,561	1,206		

Table 4-4 Mean Monthly Rainfall at Respective Rainfall Gauging Stations

Unit : mm

Stn. No.	Station Name	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1007	Kakani	15	25	45	59	167	439	676	748	448	90	9	17	2,738
1012	Sundarijal	20	19	30	69	112	328	576	603	259	48	8	4	2,077
1013	Sundarijal	17	18	28	74	124	348	601	671	306	57	10	2	2,257
1014	Indian Embassy	16	17	31	48	93	242	390	343	162	51	7	2	1,401
1015	Thankot	18	24	43	77	142	275	513	461	323	88	7	22	1,994
1022	Godawari	21	21	34	54	116	300	517	457	264	68	5	16	1,873
1029	Khumaltar	15	19	27	56	96	194	331	243	159	61	4	18	1,221
1030	Kathmandu Airport	14	18	33	53	105	234	356	289	187	66	6	14	1,375
1035	Sankhu	9	26	30	54	141	317	526	509	283	71	9	13	1,988
1039	Panipokhari	12	18	34	82	116	258	384	345	197	66	8	12	1,533
1043	Tika Bhairaw	10	17	31	61	125	323	464	444	271	80	5	13	1,846
1047	Pharpin	17	15	18	30	84	257	291	234	157	46	3	8	1,159
1052	Bhaktapur	12	21	34	55	138	261	394	349	197	53	3	14	1,531
1056	Tokha	28	21	26	62	156	369	507	518	182	50	6	16	1,941
1059	Changu Narayan	16	23	32	60	148	237	421	395	229	62	6	21	1,650
1060	Chapa Gaun	15	19	29	53	98	215	390	305	223	53	6	26	1,431
1061	Lubhu	12	12	16	66	110	202	364	304	167	57	6	18	1,335
1071	Budhanilkantha	80	20	61	55	184	319	483	415	227	52	3	13	1,914

Table 4-5 (1/7) Monthly Rainfall at Respective Rainfall Gauging Station (1/7)

Station : Kakani (No. 1007) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1962	48.3	54.6	55.4	62.8	161.4	465.3	837.4	1,110.2	669.4	30.8	0.0	5.1	3,500.7
1963	12.7	5.4	110.2	69.6	192.4	469.7	607.7	955.5	431.4	174.5	37.9	2.0	3,069.0
1964	5.1	25.4	2.3	50.2	205.4	255.0	611.3	1,096.7	597.3	110.4	0.0	0.0	2,959.1
1965	0.0	8.7	30.0	32.0	19.9	211.4	497.8	578.2	371.0	19.4	22.9	0.0	1,791.3
1966													
1967													
1968													
1969													
1970													
1971													
1972	12.0	33.0	96.7	50.5	111.3	497.6	1,193.5	465.0	388.7	119.0	21.0	0.0	2,988.3
1973	34.0	49.3	44.5	39.5	178.0	570.5	354.0	738.4	964.2	136.0	11.0	0.0	3,119.4
1974	0.0	2.0	114.9	12.8	158.0		509.9	653.0	392.0	97.0	0.0	11.0	
1975	17.0	31.6	10.8	57.0	113.8	252.7	802.8	829.7	703.0	137.5	0.0	0.0	2,955.9
1976	37.2	24.6	0.0	112.0	129.8	465.5	641.7	790.4	429.5	22.0	0.0	0.0	2,652.7
1977	4.5	0.0	27.0	111.0	135.0	390.5	623.8	655.4	250.8	111.0	18.0	66.2	2,393.2
1978	3.5	19.0	91.7	53.5	215.9	771.9	770.7	726.7	415.1	142.4	2.0	5.2	3,217.6
1979	7.5	34.0	1.5	100.0	11.2	221.4	743.6	399.1	47.0	84.9	11.0	78.4	1,739.6
1980	0.0	38.6	32.9	6.5	162.0	830.7	670.7	648.8	382.4	64.7	0.0	4.8	2,842.1
1981	31.5	0.0	31.3	122.3	111.7	344.8	640.2	700.1	364.5	0.0	28.0	0.0	2,374.4
1982	17.0	46.8	40.0	37.1		356.7	608.5	596.1	245.1	30.4	17.5	2.0	
1983	14.0	7.0	26.7	79.2	160.1	294.6	647.7	961.1	573.9	198.4	0.0	22.5	2,985.2
1984	34.7	3.3	0.0	61.5	251.6	484.5	606.5	761.6	420.3	40.8	0.0	5.2	2,670.0
1985	20.8	2.0	0.0	22.3	195.0	494.0	723.7	915.6	693.7	190.2	4.7	25.4	3,287.4
1986	0.0	24.9	42.1	124.5	163.6	736.3	676.7	703.2	407.0	116.7	0.0	58.2	3,053.2
1987	6.7	42.0	74.5	31.8	153.5	293.4	839.3	389.2	320.9	146.9	0.0	24.0	2,322.2
1988	0.0	22.0	75.3	38.4	260.3	442.5	760.4	728.7	312.7	50.8	18.8	65.0	2,774.9
1989	34.5	11.5	56.9	2.4	254.2	408.5	716.0	1,013.6	580.0	62.2	0.0	22.2	3,162.0
1990	0.0	99.5	93.3	60.8	193.8	679.2	682.1	765.6	347.5	65.5	3.3	3.2	2,993.8
1991	11.4	17.8	76.1	75.4	287.0	337.3	539.6	816.9	510.0	5.8	0.0	12.2	2,689.5
1992	18.2	16.8	0.0	69.2	188.7	269.8	590.0	698.6	371.7	83.4	21.2		
Average	14.8	24.8	45.4	59.3	167.2	439.3	675.8	747.9	447.6	89.6	8.7	17.2	2,737.6

Station : Sundarijal, Power House (No. 1012) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1940						266.4	723.9	542.8	122.3	0.0	0.0	10.0	
1941	12.2	0.0	0.0	47.0	182.0	631.4	370.1	491.5	171.2	50.3	14.9	0.0	1,970.6
1942	0.0	0.0	0.0	193.7	26.2	342.7	544.1	853.7	348.9	7.3	0.0	0.0	2,316.6
1943	17.7	64.4	11.4	128.5	131.1	293.6	491.3	744.8	328.9	36.7	0.0	0.0	2,248.4
1944	45.4	46.1	80.6	90.9	85.2	213.8	561.4	610.3	452.6	34.8	0.0	0.0	2,221.1
1945	154.5	15.2	11.7	133.2	83.8	229.4	451.1	733.5	403.1	130.5	1.8	0.0	2,347.8
1946	0.0	102.9	29.0	157.0	184.9	419.3	755.5	579.3	297.9	156.0	0.2	0.0	2,682.0
1947	8.6	3.0	35.4	120.6	109.8	152.1	735.1			14.0	0.0	1.5	
1948	0.0	24.7	34.1	164.5	266.3	322.3	805.5	568.6	336.9	184.3	47.8	0.0	2,755.0
1949	0.0	44.7	12.2	165.0	232.2	292.7	711.0	686.7	199.7	96.1	0.0	5.6	2,445.9
1950	15.2	19.8	49.5	9.6	113.1	376.4	853.4	742.4	209.1	11.7	0.0	6.4	2,406.6
1951	17.7	30.8	31.2	48.0	72.2	385.3	553.3	724.1	103.9	58.4	12.7	0.0	2,037.6
1952	0.0	3.8	73.2	39.6	98.2	228.2	692.6	557.9	274.0	0.0	0.0	0.0	1,967.5
1953	17.2	6.6	62.2	13.7	147.8	310.6	571.7	467.7	386.7	22.9	0.0	0.0	2,007.1
1954	7.1	40.4	0.0	0.0	85.7	415.3	747.7	765.1	419.6	0.0	0.0	44.5	2,525.4
1955					105.7	474.6	544.9	926.4	71.0				
1956	0.0	7.1	27.7	24.3	268.1	630.1	641.1	480.9	270.5	103.5	2.5	0.0	2,455.8
1957	59.9	0.0	12.2	0.0	108.7	124.7	545.5	624.6	165.7	0.0	0.0	0.0	1,641.3
1958					6.4	128.9	445.9	514.8	257.8			0.0	
1959	31.3	0.0	0.0	27.4	122.5	262.3	377.8	595.2	521.8	94.4	0.0	0.0	2,032.7
1960	8.1	7.4	39.9	0.0	127.3	317.1	421.7	296.6	137.6	37.3	0.0	0.0	1,393.0
1961	25.4	10.4	119.4	0.0	20.3	251.2	511.9	610.2	125.7	0.0	0.0	0.0	1,674.5
1962	41.9	9.6	66.0	110.2	103.3	615.0	455.2	715.0	331.1	35.5	0.0	0.0	2,482.8
1963	12.7	18.3	55.7	27.9	73.9	335.0	467.0	741.0	296.8	43.7	39.8	0.0	2,111.8
1964	0.0	0.0	0.0	98.0	81.5	226.3	519.7	495.3	296.2	39.6	5.6	0.0	1,762.2
1965	0.0	5.3	0.0	0.0	20.8	215.0	446.7	509.3	133.2	104.2	15.7	0.0	1,450.2
1966	37.6	34.5	0.0	0.0	75.1	202.8	581.5	580.4	121.8	19.1	0.5	2.5	1,655.8
1967	0.0	1.0	46.7	117.4	10.7	299.0	815.3	407.2	222.1	0.0	72.6	0.0	1,992.0
1968													
1969													
1970													
1971													
1972													
1973													
1974													
1875													
1976	15.1	14.4	0.0	82.0	186.6	441.6	483.7	629.2	329.4	30.5	0.0	0.0	2,212.5
1977	5.6	6.9	25.0	77.1	130.0	446.8	450.1	292.0	170.1	40.9	18.4	31.8	1,694.7
Average	19.7	19.2	30.5	69.5	112.4	328.3	575.9	603.0	258.8	48.3	8.3	3.5	2,077.3

Table 4-5 (2/7) Monthly Rainfall at Respective Rainfall Gauging Station (2/7)

Station : Sundarijal, Reservoir (No. 1013) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1940						362.7	922.8	824.1	147.4	0.0	0.0	0.0	
1941	13.2	0.0	0.0	60.9	172.8	790.8	531.5	660.1	211.5	71.0	13.3	0.0	2,525.1
1942	0.0	0.0	0.0	195.8	32.5	374.7	703.1	1,011.4	484.3	7.1	0.0	0.0	2,808.9
1943	16.2	74.7	22.1	131.8	172.6	363.7	840.7	958.4	406.9	22.9	0.0	0.0	3,010.0
1944	31.9	58.1	84.1	101.3	84.4	266.1	592.1	710.2	457.5	39.4	0.0	0.0	2,425.1
1945	110.9	11.4	10.4	147.2	129.3	346.3	504.7	993.1	503.5	151.5	1.0	0.0	2,909.3
1946	0.0	74.7	12.4	219.2	174.2	418.0	976.8	740.2	375.2	253.0	16.2	0.0	3,259.9
1947	14.7	11.9	7.4	209.0	328.4	204.7	873.2			15.5	0.2	0.8	
1948	0.0	21.3	28.9	164.5	261.6	400.5	753.1	794.3	542.4	143.5	15.5	0.0	3,125.6
1949	0.0	55.6	11.7	146.5	227.2	243.5	698.4	742.2	228.8	124.3	0.0	0.0	2,478.2
1950	12.8	14.5	28.3	5.1	129.1	363.9	388.6	340.9	143.8	7.4	0.0	5.1	1,439.5
1951	12.2	17.3	12.0	36.5	27.6	204.5	484.6	625.8	232.2	28.2	11.4	0.0	1,692.3
1952	0.0	5.8	41.8	39.4	84.9	274.6	707.6	765.8	382.5	0.0	0.0	0.0	2,302.4
1953	29.2	6.6	73.6	19.3	11.5	478.1	710.1	593.8	290.5	12.2	0.0	0.0	2,224.9
1954	5.6	22.8	0.0	0.0	97.6	415.0	801.3	784.2	426.9	0.0	0.0	0.0	2,553.4
1955					115.6	371.0	565.7	1,097.1	324.3	25.1	0.0	0.0	
1956	0.0	3.1	0.0	15.2	312.1	624.3	412.2	570.6	236.0	120.3	15.2	0.0	2,309.0
1957	45.7	0.0	17.8	1.0	32.2	129.3	536.6	620.7	129.1	0.0	0.0	0.0	1,512.4
1958					7.6	180.7	318.7	582.7	198.1	0.0	0.0	0.0	
1959	0.0	0.0	0.0	44.9	132.6	172.1	373.9	801.6	422.9	46.5	0.0	0.0	1,994.5
1960	14.2	20.1	63.5	0.0	64.5	266.8	512.7	510.9	184.4	54.6	0.0	0.0	1,691.7
1961	22.9	5.1	127.0	0.0	66.1	219.1	645.1	696.6	165.5	0.0	0.0	0.0	1,947.4
1962	38.1	0.0	26.7	157.5	57.7	562.4	520.8	614.8	356.2	32.5	0.0	0.0	2,366.7
1963	17.8	24.1	0.0	28.0	85.3	367.7	520.5	791.9	328.3	46.5	53.0	0.0	2,263.1
1964	0.0	0.0	0.0	78.0	102.8	274.8	374.8	722.5	283.1	49.9	18.2	0.0	1,904.1
1965	0.0	5.3	0.0	2.0	28.0	269.4	565.9	482.5	158.3	111.5	26.4	0.0	1,649.3
1966	40.6	30.7	0.0	7.1	80.8	345.7	402.7	632.3	171.0	17.3	0.1	0.5	1,728.8
1967	0.0	0.0	24.2	120.7	28.4	335.5	661.9	551.0	299.0	0.0	41.0	0.0	2,061.7
1968	22.0	19.0	51.4	60.0	63.6	443.8	830.5	633.7	207.5	113.6	0.0	0.0	2,445.1
1969	23.0	3.0	41.8	29.4	117.3	114.1	558.8	510.5	441.5	86.4	3.2	0.0	1,929.0
1970	33.6	37.2	23.6	80.8	147.5	346.5	607.5	645.7	286.0	55.3	4.1	0.0	2,267.8
1971	0.0	6.2	36.1	140.7	81.4	785.1	438.4	642.2	136.7	115.7	0.0	0.0	2,382.5
1972	8.4	21.0	108.2	18.7	42.3	213.0	651.4	304.3	246.0	68.2	97.7	0.0	1,779.2
1973	8.4	27.6	65.6	23.4	214.2			661.9	627.8	168.1	13.8	0.0	
1974	9.4	5.0	21.0	43.5	252.5	252.8	459.2	532.0	376.5	37.2	0.0	18.0	2,007.1
1975	28.6	40.3	11.3	100.7	149.2	262.3	622.3	772.4	476.1	77.6	0.0	0.0	2,540.8
1976	25.6	13.2	0.0	74.7	301.3	447.1	568.5	558.8	302.1	40.7	0.0	1.0	2,333.0
1977	17.5	7.5	26.0	85.3	156.0	381.5	614.0	357.1	148.7	21.2	32.9	52.3	1,900.0
Average	17.2	18.4	27.9	73.9	123.6	347.9	601.4	671.3	306.4	57.0	9.6	2.0	2,256.6

Station : Indian Embassy (No. 1014) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1947							625.6	247.2	215.4	7.4	0.0	1.3	
1948	0.0	20.0	1.3	92.8	218.6	257.7	428.5	401.6	250.8	73.4	48.7	0.0	1,793.4
1949	0.0	36.3	4.3	113.1	150.0	127.2	300.8	414.4	124.8	92.7	0.0	5.3	1,368.9
1950	18.5	14.7	44.1	21.6	107.6	340.0	507.0	423.2	44.9	7.9	0.0	6.6	1,536.1
1951	15.2	20.0	25.9	14.1	56.4	241.4	319.8	416.8	95.0	15.5	4.3	0.0	1,224.4
1952	3.1	9.4	69.6	71.8	105.1	152.8	313.8	327.6	220.6	0.0	6.6	0.0	1,280.4
1953	19.3	0.0	43.7	16.8	48.8	196.1	586.6	196.9	251.1	4.3	0.0	0.0	1,363.6
1954	5.6	15.9	1.0	4.1	91.3	266.4	555.0	520.2	121.0	13.2	0.0	0.0	1,593.7
1955	8.9	2.8	25.7	41.7	34.9	167.4	345.4	304.4	169.8	27.6	0.0	2.0	1,130.6
1956	20.9	26.4	47.1	57.7	234.9	333.1	422.7	363.0	178.9	65.0	23.1	3.6	1,776.4
1957	60.8	0.0	15.9	10.2	84.4	122.3	275.3	361.6	30.8	28.7	0.0	10.7	1,000.7
1958	14.7	0.0	16.6	37.9	82.8	119.6	246.2	357.8	204.4	54.3	0.0	0.0	1,134.3
1959	33.4	1.0	21.2	21.5	84.5	180.0	239.7	309.0	214.3	90.7	0.0	0.0	1,195.3
1960	0.0	7.6	56.8	17.2	125.4	208.1	365.1	220.0	155.7	45.6	0.0	0.0	1,201.5
1961	8.4	67.9	21.4	21.3	39.9	288.3	396.2	525.6	130.4	190.7	1.6	13.0	1,704.7
1962	60.9	66.8	44.5	109.2	95.0	302.9	179.4	313.5	84.0	1.3	0.0	4.0	1,261.5
1963	13.0	1.8	65.5	68.0	72.7	207.5	304.4	331.5	181.9	45.4	19.1	2.7	1,313.5
1964	0.2	1.6	9.3	75.9	66.0	279.7	437.0	287.9	203.5	21.4	2.0	0.3	1,384.8
1965	1.7	4.8	16.5	37.5	47.5	349.8	345.5	342.0	82.7	62.6	42.9	0.0	1,333.5
1966	37.4	40.4	0.6	8.1	82.9	162.8	396.7	437.0	43.9	9.4	1.2	3.4	1,223.8
1967	0.0	1.3	51.2	60.8	11.6	245.0	476.4	353.5	142.9	0.0	5.9	0.0	1,348.6
1968	30.5	9.0	44.8	28.9	130.2	331.8	462.0	279.2	83.3	139.5	0.0	0.0	1,539.2
1969	9.7	2.2	44.6	31.3	60.5	114.8	315.9	340.9	144.0	65.0	2.3	0.0	1,131.2
1970	24.2	23.1	24.9	41.9	85.6	235.6	458.1	310.8	197.4	34.5	3.8	0.0	1,439.9
1971	4.3	7.0	21.9	176.1	145.7	697.5	230.6	256.5	59.7	80.3	1.9	0.0	1,681.5
1972	2.6	25.3	82.6	35.8	82.6	226.8	529.0	204.7	203.2	93.9	23.0	0.0	1,509.5
1973	26.3	41.8	43.6	23.6	91.6	400.3	416.0	418.4	373.9	126.7	7.0	0.0	1,969.2
1974	15.0	4.9	15.1	38.4	91.3	80.8	324.6	290.0	212.4	30.3	0.0	9.7	1,112.5
1975	26.6	16.4	7.8	58.8	86.9	128.3	494.9	380.6	279.5	46.9	0.0	0.0	1,526.7
Average	16.5	16.7	31.0	47.7	93.4	241.6	389.6	342.6	162.1	50.8	6.7	2.2	1,400.8

Table 4-5 (3/7) Monthly Rainfall at Respective Rainfall Gauging Station (3/7)

Station : Thankot (No. 1015) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1967	0.0	0.0	63.0	61.7	33.2	267.1	508.2	411.1					
1968						169.0	330.8	298.2	133.6	219.0	0.0	0.0	
1969	13.2	3.6	76.4	26.8	81.8	192.2	245.8	338.4	202.4	8.4	0.0	0.0	1,189.0
1970	34.8	28.8	40.4	53.6	188.8	231.2	427.4	371.8	200.8	12.0	0.0	0.0	1,589.6
1971	6.4	6.4	18.4	194.6	208.4	618.6	276.8	296.2	46.4	138.8	0.0	0.0	1,811.0
1972	0.0	38.4	65.6	19.2	63.6	318.0	729.2	195.6	266.0	131.2	24.8	0.0	1,851.6
1973	34.4	65.2	67.2	29.2	140.0	542.4	495.4	409.6	611.4	224.4	13.6	0.0	2,632.8
1974	30.6	8.8	42.4	68.8	297.6	115.2	546.6	549.8	488.4	44.4	0.0	14.0	2,206.6
1975	32.4	28.4	4.4	52.4	165.6	174.8	732.8	458.2	401.6	41.2	0.0	0.0	2,091.8
1976	40.2	5.0	0.0	100.6	285.6	780.8	457.0	516.2	423.8	34.0	0.0	0.0	2,643.2
1977	24.0	20.0	34.0	163.2	213.2	334.2	578.6	670.6	100.6	92.0	0.0	57.2	2,287.6
1978	0.0	27.0	125.6	190.4	208.9	384.2	656.9	541.8	542.1	230.5	0.0	3.7	2,911.1
1979	12.0	34.7	0.0	142.6	73.0	471.5	701.1	885.6	136.9	41.8	41.0	100.8	2,641.0
1980	0.0	13.9	67.5	15.7	73.3	263.5	590.3	654.0	405.2	123.3	0.0	9.6	2,216.3
1981	21.3	0.0	60.9	152.6	113.0	125.5	371.6	202.2	261.7	0.0	34.0	0.9	1,343.7
1982	21.7	33.0	42.5	73.6	25.9	58.5	123.1	267.6	221.7	14.3	36.5	0.0	918.4
1983	30.3	5.5	23.8	75.5	138.3	94.0	485.6	287.9	340.1	43.2	0.0	39.7	1,563.9
1984	19.3	21.4	20.5	51.9	103.5	292.7	692.6	254.5	453.7	30.6	0.0	8.1	1,948.8
1985	8.5	0.0	0.0	59.8	165.5	180.3	586.4	679.6	622.5	253.1	0.0	80.8	2,636.5
1986	0.0	58.5	16.2	104.7	180.3	487.9	636.5	477.6	422.1	60.3	0.0	55.6	2,499.7
1987	5.1	68.8	51.1	40.7	51.0	148.6	966.7	481.5	192.5	216.4	0.0	31.6	2,254.0
1988	7.2	10.0	78.0	7.2	96.8	104.2	485.0	646.5	433.2	24.3	20.4	111.6	2,024.4
1989	76.7	24.5	23.9	6.4	276.6	234.9	508.8	421.6	431.2	24.7	0.0	0.3	2,029.6
1990	0.0	47.6	82.5	104.6	170.5	218.7	621.7	596.1	213.3	55.6	0.0	1.0	2,111.6
1991	29.5	22.5	71.1	133.7	87.8	215.0	220.9	548.9	255.8	0.0	1.0	33.4	1,619.6
1992	10.4	23.5	1.0	7.1	113.5	125.8	363.2	530.3	264.8	135.2	14.5	5.1	1,594.4
Average	18.3	23.8	43.1	77.5	142.2	275.0	513.0	461.2	322.9	87.9	7.4	22.1	1,994.5

Station : Godawari (No. 1022) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1953	34.1	0.0	68.9	26.6	72.1	231.8	726.8	297.5	294.4	12.2	0.0	0.0	1,764.4
1954	11.3	20.2	9.6	7.0	144.8	307.0	614.1	693.3	248.1	28.2	0.0	0.0	2,083.6
1955	7.2	0.0	52.4	46.4	89.3	265.4	612.1	609.2	348.0	33.9	0.0	0.0	2,063.9
1956	29.2	19.4	41.7	20.9	311.0	618.7	489.6	486.4	208.9	154.2	11.0	2.9	2,393.9
1957	86.2	0.0	21.4	8.4	42.5	230.3	452.1	450.2	103.1	3.7	0.0	0.0	1,397.9
1958	29.9	0.0	14.5	44.3	83.6	213.1	337.4	460.9	175.4	96.4	0.0	0.2	1,455.7
1959	50.7	0.7	28.7	17.4	61.3	234.3	448.1	481.2	210.4	100.2	0.0	0.0	1,633.0
1960	0.0	0.0	62.8	29.7	146.1	310.1	486.7	478.6	192.9	57.6	1.7	0.0	1,766.2
1961	9.5	87.0	16.4	31.6									
1962	88.2	39.7	53.4	71.0	111.1	507.8	367.5	642.4	403.8	18.7	0.0	33.6	2,337.2
1963			45.2	189.1	66.0	168.8	315.6	509.6	234.7	48.2	6.2		
1964			3.8	79.3	118.6	240.9	413.2	295.9	232.8	40.5			
1965										119.8	12.0		
1966	41.9	31.7	0.0	23.0	118.9	190.3	364.8	574.0	84.0				
1967	0.0	0.0	77.0	69.0	9.8	199.0	580.4	480.2	118.0	12.0		1.2	
1968	57.1	10.6											
1969													
1970								433.8	165.0	68.4	0.6	0.0	
1971	4.0	31.3	13.2	136.6	166.2	697.9	349.0	409.0	90.2	95.4	0.0	0.0	1,992.8
1972	0.0	28.9	38.3	51.9	55.4	298.8	728.9	250.7	351.9	99.5	22.9	0.0	1,927.2
1973	33.0	44.7	68.7	15.9	105.7	531.9	447.4	445.9	464.0	266.8	6.4	0.0	2,430.4
1974	13.2	9.3	65.2	49.0	136.1	180.3	664.5	553.6	376.1	34.1	0.0	12.5	2,093.9
1975	32.1	14.8	7.5	54.7	163.4	319.5	697.5	426.9	394.1	23.2	0.0	0.0	2,133.7
1976	34.5	12.0	0.0	71.3	116.7	476.3	505.3	359.4	394.1	12.0	0.0	0.0	1,981.6
1977	12.1	18.2	11.2	104.3	135.0	194.2	655.5	299.3	90.3	35.2	7.2	55.9	1,618.4
1978	2.5	25.0	78.1	65.6	127.7	367.8	414.4	625.5	373.3	124.4	0.6	4.7	2,209.6
1979	6.2	51.8	1.1	47.5	63.7	329.8	548.3	345.1	70.5	34.1	6.7	79.3	1,584.1
1980	0.0	11.7	25.2	19.2	111.2	440.0	474.6	389.7	256.8	32.3	0.0	5.5	1,766.2
1981	30.2	0.4	45.2	96.3	137.7	185.7	419.6	349.5	412.8	0.1	20.4	0.0	1,697.9
1982	14.8	16.3	55.2	43.5	79.7	303.8	374.8	522.7	228.8	11.2	17.7	1.8	1,670.3
1983	20.5	8.3	6.8	59.0	213.8	90.8	586.7	454.6	298.1	164.4	0.0	14.3	1,917.3
1984	25.7	19.6	12.0	65.2	157.7	416.8	448.5	489.5	537.9	27.5	0.0	11.3	2,211.7
1985	20.0	0.0	0.0	27.1	140.2	226.3	846.5	483.6	455.2	274.1	0.0	79.8	2,552.8
1986	0.0	24.0	25.8	85.3	133.4	460.5	432.1	315.8	313.5	55.8	2.5	60.0	1,908.7
1987	3.0	74.9	60.5	56.3	38.2	198.5	801.1	430.2	181.9	201.0	0.0	15.5	2,061.1
1988	3.0	25.0	81.3	68.8	125.4	279.5	465.1	523.7	253.7	15.3	30.7	102.2	1,973.7
1989	0.0	12.3	27.2	2.8	155.3	150.0	541.3	321.3	339.7	52.7	0.0	0.0	1,602.6
1990	0.0	60.4	60.5	68.9	148.6	241.5	659.3	576.7	244.8	24.6	0.0	1.4	2,086.7
1991	38.7	15.5	61.1	63.0	45.7	228.0	356.8	506.3	168.2	0.0	0.0	25.8	1,509.1
1992	8.0	12.8	0.0	20.6	141.3	170.8	471.0	480.1	194.2	55.1	16.0	7.5	1,577.4
Average	21.3	20.8	34.4	53.8	116.4	300.2	517.0	457.0	264.2	67.6	4.8	15.6	1,873.1

Table 4-5 (4/7) Monthly Rainfall at Respective Rainfall Gauging Station (4/7)

Station : Khumaltar (No.1029) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1967					30.0	153.5		264.7	169.1	7.4	1.8	0.2	
1968	20.6	7.0	14.0	24.3	64.4	291.0	428.4	270.3	72.0	141.8	0.0	1.0	1,334.8
1969	12.0	1.0	59.7	33.4	64.9	88.8	248.3	241.0	153.5	8.0	11.0	0.0	921.6
1970	31.5	39.5	24.5	54.0	75.7	204.5	403.4	264.5	109.5	25.5	0.0	0.0	1,232.6
1971	5.0	7.0	16.0	179.5	177.5	462.0	248.0	138.0	46.0	84.5	0.0	0.0	1,363.5
1972	0.0	29.8	43.0	19.0	51.8	182.7	429.7	143.0	203.7	84.2	10.1	0.0	1,197.0
1973	25.8	30.8	38.2	13.0	72.9	263.1	320.9	232.6	276.4	141.0	7.0	0.0	1,421.7
1974											0.0	38.2	
1975	30.0	35.1	6.1	53.2	101.8	150.3	438.4	337.7	249.3	26.1	0.0	0.0	1,428.0
1976	39.0	8.2	0.0	48.2	96.3	288.1	245.7	233.7	117.6	12.1	0.0	0.0	1,088.9
1977	13.0	12.0	8.6	103.9	88.8	226.6	281.9	259.7	53.6	35.4	8.2	52.0	1,143.7
1978	1.1	20.7	73.9	27.5	152.5	288.8	512.2	295.5	215.3	107.4	1.5	1.3	1,697.7
1979	1.0	39.5	0.0	47.0	12.4	176.3	299.4	252.8	36.4	21.6	5.5	67.9	959.8
1980	0.9	7.0	30.4	7.5	105.7	246.1	286.6	143.9	117.5	14.8	0.0	9.5	969.9
1981	6.9	0.0	40.0	101.5	102.0	136.5	259.5	242.2	251.2	0.0	19.0	0.0	1,158.8
1982	12.6	10.1	36.4	111.4	94.9	131.1	234.7	347.1	141.2	22.4	15.3	2.5	1,159.7
1983	17.0	4.0	6.5	72.1	147.5	55.2	409.0	235.5	201.4	146.3	0.0	14.0	1,308.5
1984	13.3	14.5	14.5	45.4	95.5	246.9	277.0	292.0	306.3	16.0	0.0	7.9	1,329.3
1985	9.0	0.5	4.0	35.4	121.5	136.6	356.3	292.8	327.0	182.5	0.0	67.5	1,533.1
1986	0.0	30.5	19.3	105.5	106.7	266.5	303.4	234.8	203.5	44.7	0.0	49.7	1,364.6
1987	19.4	52.0	28.8	36.7	35.8	108.4	503.2	210.2	149.1	288.6	0.0	17.0	1,449.2
1988	2.0	33.5	73.5	53.5	133.2	266.6	350.0	328.5	120.0	9.0	21.0	106.0	1,496.8
1989	58.5	10.0	4.0	0.0	217.0	61.5	357.0	136.0	149.5	2.8	0.0	0.0	996.3
1990	0.0	40.6	61.3	60.8	81.1	103.5	396.9	264.5	111.0	48.8	0.0	5.4	1,173.9
1991	18.2	8.6	39.6	60.6	90.1	153.3	137.4	231.9	107.4	0.6	0.0	22.3	870.0
1992		13.1	0.0	43.0	72.6	163.9	206.0	173.1	86.9	42.8	15.6	2.2	819.2
Average	14.6	19.0	26.8	55.7	95.7	194.1	330.6	242.6	159.0	60.6	4.5	17.9	1,220.9

Station : Kathmandu Airport (No. 1030) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1968	30.1	8.5	45.3	25.5	109.6	305.7	379.5	228.2	86.9	160.4	0.0	0.0	1,379.7
1969	8.6	1.4	47.6	27.4	86.9	166.1	299.7	323.9	175.3	40.3	2.0	0.0	1,179.2
1970	29.1	27.6	26.6	34.4	93.6	193.7	494.3	229.7	163.9	58.2	11.2	0.0	1,362.3
1971	3.0	6.3	28.4	180.8	109.7	608.1	204.6	252.6	36.4	81.2	0.2	0.0	1,511.3
1972	1.4	25.5	80.4	23.8	56.6	157.3	480.9	155.3	174.5	86.1	19.6	0.0	1,261.4
1973	23.7	32.4	48.5	25.3	81.1	340.4	456.0	336.5	321.1	119.3	15.5	0.0	1,799.8
1974	16.9	5.8	23.3	30.9	108.0	74.8	339.6	364.2	204.6	45.6	0.0	11.4	1,225.1
1975	30.6	25.4	8.0	36.1	69.1	138.5	436.1	379.0	267.5	34.2	0.0	0.0	1,424.5
1976	30.2	14.5	0.0	68.6	153.4	387.4	335.0	307.3	169.9	24.3	0.0	0.0	1,490.6
1977	11.5	12.1	17.1	103.9	90.1	265.6	322.7	338.3	78.9	29.1	14.4	13.6	1,297.3
1978	4.7	11.1	69.4	41.7	143.3	298.9	323.6	392.5	159.8	108.6	0.2	2.2	1,556.0
1979	5.6	39.3	0.7	42.1	37.3	258.1	447.3	320.3	99.1	35.7	5.6	65.3	1,356.4
1980	1.0	17.7	45.7	10.1	124.4	349.3	296.1	238.5	183.5	69.0	0.0	5.6	1,340.9
1981	14.5	0.0	60.4	100.9	216.2	140.7	304.0	266.9	225.1	0.0	42.0	0.0	1,370.7
1982	14.2	21.9	35.5	48.8	39.7	200.5	238.2	384.3	155.4	9.0	18.3	3.4	1,169.2
1983	18.2	4.0	30.2	78.7	110.1	81.4	499.9	194.2	287.7	129.9	0.0	15.3	1,449.6
1984	13.9	17.4	13.5	60.1	96.0	275.0	250.1	301.9	260.2	18.4	0.1	7.4	1,314.0
1985	9.7	3.2	4.0	24.8	132.5	160.8	418.3	434.4	375.6	167.2	0.0	54.6	1,785.1
1986	0.0	22.5	15.8	93.4	96.9	315.6	380.8	218.6	221.3	79.5	0.0	49.4	1,493.8
1987	3.2	43.3	35.9	34.4	57.6	116.4	498.8	256.3	171.2	159.3	0.0	18.8	1,395.2
1988	0.6	19.1	68.0	42.3	152.9	239.5	397.3	278.7	134.4	17.6	11.7	78.9	1,441.0
1989	47.4	10.7	12.1	4.0	148.7	135.5	328.0	206.0	196.5	42.4	0.0	0.7	1,132.0
1990	0.0	42.2	59.5	116.2	108.3	285.5	345.6	308.5	188.2	78.7	0.0	2.8	1,535.5
1991	20.7	11.4	45.2	26.3	145.3	114.4	190.3	280.7	137.7	0.4	0.2	24.9	997.5
1992	6.4	17.2	0.2	44.5	69.7	232.7	230.4	219.9	209.3	51.6	15.5	3.1	1,100.5
Average	13.8	17.6	32.9	53.0	105.5	233.7	355.9	288.7	187.4	65.8	6.3	14.3	1,374.7

Table 4-5 (5/7) Monthly Rainfall at Respective Rainfall Gauging Station (5/7)

Station : Sankhu (No. 1035) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1971	2.8	11.6	46.0	92.0	122.0	668.0	450.4	575.2	182.6	179.6	4.8	0.0	2,335.0
1972	2.8	27.2	103.6	24.4	93.2	340.8	586.8	344.6	316.4	82.0	20.0	0.0	1,941.8
1973	27.6	34.8	71.2	34.0	136.0	382.6	435.2	479.6	361.2	154.4	16.4	0.0	2,133.0
1974	13.4	13.6	40.0	38.4	107.6	232.0	591.4	469.2	295.6	35.2	0.0	13.2	1,849.6
1975	22.0	31.2	2.0	110.8	122.8	288.8	464.0	537.6	379.6	132.8	0.0	0.0	2,091.6
1976	24.0	21.2	0.0	87.2	158.0	346.4	409.2	446.8	332.8	27.8	0.0	0.0	1,853.4
1977	9.2	10.4	23.2	86.6	131.6	276.4	449.6	136.8	95.6	74.0	19.7	40.4	1,353.5
1978	0.0	17.6	97.8	26.1	384.6	692.2	796.4	916.2	395.9	90.0	0.0	7.7	3,424.5
1979	3.5	66.8	4.0	84.0	160.8	301.7	513.1	633.9	143.8	46.1	41.2	14.3	2,013.2
1980	1.0	8.2	17.5	2.7	139.0	549.4	765.1	492.4	85.6	36.7	0.0	0.0	2,097.6
1981	0.0	0.0	18.6	73.6	191.7	39.8	296.8	299.0	35.3	10.5	0.0	0.0	965.3
1982	13.7	158.2	19.1	48.5	37.5	244.0	401.2	596.9	373.6	25.5	30.5	0.0	1,948.7
1983	14.0	7.5	20.0	61.0	133.0	159.5	816.2	573.7	474.5	242.5	0.0	23.5	2,525.4
1984	22.0	18.5	8.5	26.4	157.3	279.4	589.5	541.8	348.4	3.0	0.0	2.0	1,996.8
1985	3.2	3.2	0.0	36.7	141.7	193.5	613.6	580.5	321.8	131.9	0.0	53.0	2,079.1
1986	0.0	21.0	5.0	83.5	52.0	352.5	466.0	199.5	445.5	40.0	6.0	23.0	1,694.0
1987	3.5	22.5	30.0	56.0	98.5	168.0	579.0	441.0	184.0	123.0	0.0	22.5	1,728.0
1988	0.0	23.0	57.0	55.0	196.5	305.5	527.0	515.0	120.5	26.0	15.0	65.0	1,905.5
1989	22.0	11.5	15.0	1.0	224.7	308.0	382.0	678.0	465.5	9.5	0.0	0.0	2,117.2
1990	0.0	53.5	61.5	87.5	175.0	386.5	680.7	616.0	232.0	79.0	0.0	1.0	2,372.7
1991	10.5	10.5	29.0	42.5	62.0	178.5	223.5	548.0	307.0	0.0	0.0	27.5	1,439.0
1992	8.5	5.0	1.5	21.5	79.5	275.0	528.0	568.5	333.7	20.0	40.0	0.0	1,881.2
Average	9.3	26.2	30.5	53.6	141.1	316.8	525.7	508.6	283.2	71.3	8.8	13.3	1,988.5

Station : Panipokhali (No. 1039) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1971				243.6	114.0	669.2	235.9	300.6	66.7	87.0	1.4	0.0	
1972	3.6	24.2	82.1	31.2	67.6								
1973				70.0	93.8	351.5	388.7	360.8	359.6	112.9	10.3	0.0	
1974	16.2	4.8	22.0	52.0	138.6	87.6	291.4	292.4	182.8	25.4	0.0	11.6	1,124.8
1975	15.6	4.8	1.7	54.8	94.4	162.8	479.6	359.6	275.2	45.2	0.0	0.0	1,493.7
1976	26.8	10.4	0.0	88.8	126.4	394.8	283.2	294.8	159.2	24.8	0.0	0.0	1,409.2
1977	14.6	10.0	14.4	143.0	155.1	224.7	489.0	305.1	84.9	52.4	22.7	45.9	1,561.8
1978	3.6	18.7	71.4	52.9	135.2	340.1	365.1	421.2	240.6	134.8	0.8	5.2	1,789.6
1979	10.0	46.7	0.0	49.1	58.1	245.0	359.1	340.4	48.0	60.5	54.6	17.3	1,288.8
1980	0.0	27.0	28.1	7.3	150.6	410.4	453.0	271.1	181.1	45.1	0.0	9.2	1,582.9
1981	19.1					157.9	318.2	322.0	211.3	0.5	29.8	0.0	
1982	21.2	20.2	38.9	64.6	36.2	120.0	255.3	410.2	149.6	5.6	16.3	6.6	1,144.7
1983	27.6	2.8	30.3	76.6	152.6	94.5	504.6	311.6	233.7	132.7	0.4	17.4	1,584.8
1984	0.0	32.1	20.0	90.2	147.4	328.2	427.1	380.8	318.9	21.5	0.0	8.2	1,774.4
1985	17.0	5.9	0.0	53.7	133.1	159.1	423.4	500.4	339.2	219.9	0.0	6.0	1,857.7
1986	0.0	26.8	13.0	88.6	164.5	336.0	363.7	328.7	321.0	64.7	1.0	59.1	1,767.1
1987	2.8	39.0	32.7	76.1	78.7	112.6	544.5	274.6	118.8	151.5	0.0	26.2	1,457.5
1988	3.7	0.0	126.9			285.2	484.6	378.2	138.3	26.6	7.0	0.0	
1989													
1990							385.2	327.0	147.4	49.9	0.0	1.8	
1991	15.6	12.2	62.8	144.2	132.8	161.8	253.2	381.0	175.0	0.8	0.0	22.0	1,361.4
Average	11.6	17.9	34.0	81.6	116.4	257.9	384.5	345.3	197.4	66.4	7.6	12.4	1,533.0

Station : Thika Bhairaw (No. 1043) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1971						549.2	330.8	436.6	58.5	89.2	1.8	0.0	
1972	3.0	6.0	94.2	61.2	57.8	236.6	495.8	328.8	239.2	97.2	20.8	0.0	1,640.6
1973	24.0	33.2	70.0	5.8	115.4	633.2	812.4	932.2	828.4	160.8	28.8	0.0	3,644.2
1974	12.0	42.0	56.4	63.6	162.0	197.4	486.6	526.0	247.2	105.2	0.0	16.4	1,914.8
1975	34.8	46.2	0.0	82.0	198.0	226.4	603.6	282.0	428.4	123.6	0.0	0.0	2,025.0
1976	27.6	16.4	0.0	124.8	185.9	496.7	487.2	552.1	190.7	44.1	0.0	0.0	2,125.5
1977	5.3	16.0	5.0	70.0	163.1	432.2	408.7	351.0	224.7	102.7	15.4	15.0	1,809.1
1978	2.8	8.7	91.4	71.8	220.6	383.2	783.5	645.4	380.4	113.1	2.7	3.9	2,707.5
1979	5.7	35.5	0.0	87.2	69.0	309.5	454.0	445.0	174.5	47.1	5.6	63.9	1,697.0
1980	0.0	9.4	24.2	9.8	121.7	459.1	518.9	425.6	171.0	38.5	0.0	5.2	1,783.4
1981	4.2	0.0	13.9	47.5	146.9	140.0	301.0	221.9	173.4	0.0	15.3	2.1	1,066.2
1982	0.6	13.4	20.2	45.4	29.4	196.5	294.6	336.7	92.7	11.1	3.4	2.5	1,046.5
1983	5.9	2.5	24.9	43.7	68.0	75.7	496.7	300.7	151.4	92.6	0.0	2.3	1,264.4
1984	0.0	3.0	0.0	19.6	100.0	329.0	375.2	342.5	238.5	17.0	0.0	8.5	1,433.3
1985	9.0	28.0	0.0		134.3	191.9	505.3	427.4	315.3	176.4	2.2	0.0	
1986	0.0	10.6	23.2	106.0	128.4	371.6	485.8	333.7	403.6	170.8	0.0	53.9	2,087.6
1987	0.0	0.0	0.0	0.0	0.0	279.7	494.6	454.2	242.9	152.6	0.0	21.2	1,645.2
1988	0.0	17.3	98.6	87.8	142.4	387.6	156.3	420.6	177.6	11.8	10.2	71.0	1,581.2
1989	32.8	15.8	24.2	6.6			366.7	567.1	375.3	10.4	3.5	0.0	
1990	0.0	31.7	56.3	168.2	146.9	282.2	551.1	465.4	308.9	112.9	5.5	2.9	2,132.0
1991	40.3	1.6	21.9	67.0	189.1	278.7	330.9	537.2	261.2	0.0	0.0	14.3	1,742.2
Average	10.4	16.9	31.2	61.5	125.2	322.8	463.8	444.4	270.7	79.9	5.5	13.5	1,845.7

Table 4-5 (6/7) Monthly Rainfall at Respective Rainfall Gauging Station (6/7)

Station : Pharpin (No. 1047) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1971						714.0	194.8	305.3		70.0		0.0	
1972	0.0	4.0	36.4	15.6	32.0	225.0	502.0	162.4	203.4	90.2	15.0	0.0	1,286.0
1973	22.4	25.4	20.0	8.4	66.8	192.8	234.2	121.0	161.2	112.8	8.0	0.0	973.0
1974	44.0	11.2	2.8	54.8	81.2	88.4	316.8	706.0	317.6	2.8	0.0	13.6	1,639.2
1975	33.6	24.8	19.2	60.0	203.6	318.0	536.8	318.8	326.8	16.8	0.0	0.0	1,858.4
1976	34.8	6.8	0.0	21.6	147.6	363.5	270.9	198.9	155.9	0.0	0.0	0.0	1,200.0
1977	7.2	8.6	6.2	20.3	34.6	79.7	146.3	74.4	15.2	5.2	2.6	47.5	447.8
1978	3.2	15.6	56.6	47.5	100.1	206.0	272.4	205.7	134.3	128.1	0.0	0.0	1,169.5
1979	4.0	40.3	0.0	37.8	38.1	113.6	278.2	102.1	29.8	20.0	5.4	20.2	689.5
1980	0.0	2.4	20.0	0.0	53.2	266.3	158.7	143.4	65.5	12.1	0.0	2.1	723.7
Average	16.6	15.5	17.9	29.6	84.1	256.7	291.1	233.8	156.6	45.8	3.4	8.3	1,159.5

Station : Bhaktapur (No. 1052) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1971						657.8	309.4	376.0	57.6		0.0	0.0	
1972	6.2	16.0	65.4	31.2	93.2	233.2	420.2	222.0	260.8	97.2	20.8	0.0	1,466.2
1973	22.8	48.4	66.8	33.2	106.2	468.9	332.4	398.7	313.9	0.0	0.0	0.0	
1974	11.0	10.8	26.9	33.1	174.8	112.4	454.6	335.4	215.3	46.8	0.0	11.6	1,432.7
1975	29.3	28.4	8.8	40.0	91.2	174.0	339.6	310.4	375.6	47.2	0.0	0.0	1,444.5
1976	25.2	19.2	0.0	65.6	145.6	308.2	277.8	471.2	199.0	24.8	0.0	0.0	1,536.6
1977	13.2	14.0	22.4	66.4	105.2	289.6	268.0	291.8	104.0	53.5	11.1	42.4	1,281.6
1978	4.4	18.8	88.6	66.0	212.3	306.9	498.9	416.8	180.1	116.8	1.1	1.9	1,912.6
1979	6.9	40.7	0.1	27.7	75.2	276.2	378.6	270.9	58.4	36.9	6.3	33.2	1,211.1
1980	0.0	12.9	18.8	6.7	147.5	263.0	335.5	278.2	121.2	86.8	0.0	4.2	1,274.8
1981	4.9	0.1	33.4	92.3	179.9	163.0	316.7	237.5	230.3	0.0	0.0	0.0	1,258.1
1982	10.5	10.7	68.4	41.8	39.3	111.7	256.6	377.5	122.1	41.1	1.5	0.6	1,081.8
1983	12.6	11.2	20.3	183.5	171.9	105.3	973.3	475.8	267.7	141.8	0.0	17.2	2,380.6
1984	30.0	25.5	25.7	121.8	212.6	285.4	464.8	315.8	285.1	20.1	0.0	6.1	1,792.9
1985	17.0	16.7	0.0	34.1	179.9	318.2	498.6	454.0	339.6	189.9	0.0	59.1	2,107.1
1986	0.0	34.9	12.1	44.0	178.2	426.7	372.7	400.8	294.0	48.7	6.3	62.1	1,880.5
1987	29.6	53.8	63.8	101.5	70.6	231.6	454.3	307.0	103.7	50.2	0.0	18.5	1,484.6
1988	0.0	22.0	98.6	63.3	157.2	387.0	518.0	285.7	218.0	10.0	25.0	0.0	1,784.8
1989	0.0	0.0	10.0	0.0	153.7	87.0	312.7	263.6	242.0	26.0	0.0	0.0	1,095.0
1990	0.0	27.4	47.6	50.7	167.5	134.1	459.9	691.3	129.3	34.9	0.0	10.0	1,752.7
1991	15.2	13.1	35.7	44.8	166.1	115.3	159.9	237.4	90.0	0.7	0.0	26.8	905.0
1992	8.4	25.4	0.0	16.4	76.6	277.6	258.5	251.6	119.6	40.8	0.0	18.1	1,093.0
Average	11.8	21.4	34.0	55.4	138.3	260.6	393.7	348.6	196.7	53.1	3.3	14.2	1,531.0

Station : Tokha (No. 1056) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1973	30.8	34.4	9.8	129.2	148.4	341.4	429.8	1,064.2	582.2	127.4	15.8	3.2	2,916.6
1974	83.9	0.0	52.0	17.5	117.7	304.9	583.1	710.2	111.3	26.4	0.0	0.0	2,007.0
1975	104.1	40.1	0.0	108.3	359.3	449.3	896.5	902.6	430.9	2.2	0.0	0.0	3,293.3
1976	16.6	0.0	10.9	27.6	218.3	537.9	339.0	313.2	9.0	12.2	0.0	0.0	1,484.7
1977	0.0	0.0	10.3	40.6	164.4	198.0	286.9	304.4	28.8	81.6	22.5	36.2	1,173.7
1978	0.0	0.0	67.4	65.2	113.9	332.4	371.0	381.6	45.0	71.6	6.0	0.0	1,454.1
1979	0.0	20.6	18.4	42.9	20.6	194.9	738.7	246.6	31.3	45.6	0.0	81.6	1,441.2
1980	2.0	44.4	0.0	62.4	102.0	590.7	411.1	222.3	219.1	34.7	4.0	8.6	1,701.3
1981	18.8	50.1	61.6										
Average	28.5	21.1	25.6	61.7	155.6	368.7	507.0	518.1	182.2	50.2	6.0	16.2	1,940.9

Station : Changu Narayan (No. 1059) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1974						151.9	439.9	454.4	239.4	36.5	0.0	10.6	
1975	27.1	24.5	10.1	50.9	66.1	143.4	492.4	458.2	309.2	62.6	0.0	0.0	1,644.5
1976	28.4	18.5	0.0	83.4	169.9	370.6	314.2	490.5	239.0	80.7	0.0	0.0	1,795.2
1977	8.2	6.6	20.3	109.8	119.2	290.3	366.1	253.7	107.6	105.0	8.0	36.4	1,431.2
1978	10.4	17.0	84.6	45.9	191.5	325.5	620.2	421.6	227.8	88.3	4.4	6.4	2,043.6
1979	5.8	17.5	1.0	43.4	45.5	138.3	355.5	359.0	78.7	53.2	5.2	45.1	1,148.2
1980	0.0	14.1	30.4	5.2	84.5	304.6	373.9	274.6	109.8	54.8	0.0	7.8	1,259.7
1981	28.8	0.0	45.7	74.3	185.6	151.5	347.3	276.3	155.6	0.0	16.8	0.0	1,281.9
1982	7.8	17.1	39.9	58.2	38.7	284.4	285.9	524.6	188.8	52.4	24.2	5.5	1,527.5
1983	16.7	7.0	29.5	80.3	166.7	158.1	698.5	436.5	291.6	104.2	0.0	0.0	1,989.1
1984	0.0	36.0	13.3	51.1	172.4	298.0	462.4	403.5	338.2	22.5	11.4	10.8	1,819.6
1985	77.5	10.4	2.3	42.4	237.2	230.3	540.6	682.1	386.2	171.5	0.0	75.9	2,456.4
1986	0.0	38.4	22.0	66.9	181.8	334.4	313.3	378.3	264.1	63.8	0.0	61.6	1,724.6
1987	10.6	58.6	30.5	34.9	51.2	155.3	494.4	309.0	224.0	118.1	0.0	32.4	1,519.0
1988	0.0	25.7	74.9	56.0	175.4	298.3	524.3	348.0	119.6	17.8	18.2	71.9	1,730.1
1989	34.9	9.5	43.1	4.9	153.4	152.3	353.8	365.7	364.7	46.3	0.0	4.4	1,533.0
1990	0.0	61.0	79.1	176.5	302.2	317.4	455.4	354.1	199.8	47.5	6.7	0.0	1,999.7
1991	26.3	41.3	41.6	56.0	180.3	131.2	188.0	315.4	271.2	10.3	0.0	21.5	1,283.1
1992	9.1	19.3	0.0	31.5	145.6	270.9	373.4	404.8	238.8	36.9	19.0	11.2	1,560.5
Average	16.2	23.5	31.6	59.5	148.2	237.2	421.0	395.3	229.2	61.7	6.0	21.1	1,650.5

Table 4-5 (7/7) Monthly Rainfall at Respective Rainfall Gauging Station (7/7)

Station : Chapa Gaun (No. 1060) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1976	29.0	7.4	0.0	35.7	80.7	395.7	338.6	277.6	201.2	13.5	0.0	0.0	1,379.4
1977	7.9	17.4	12.2	96.5	104.2	216.5	429.7	209.6	78.4	20.0	15.0	70.9	1,278.3
1978	2.5	21.5	55.3	61.1	135.9	253.7	319.1	492.7	290.1	37.4	0.0	3.1	1,672.4
1979	6.5	43.1	0.2	53.3	33.1	131.2	409.8	267.4	62.0	20.7	5.8	64.5	1,097.6
1980	0.0	5.2	30.3	9.4	91.3	385.5	384.5	239.4	245.6	8.2	0.0	4.4	1,403.8
1981	16.8	0.0	36.7	98.8	97.9	167.3	281.6	296.1	341.3	0.0	28.4	0.0	1,364.9
1982	14.1	19.9	42.0	33.2	74.3	166.6	238.4	393.9	202.3	11.2	11.7	3.5	1,211.1
1983	17.7	6.4	32.1	60.1	104.4	104.3	425.5	266.4	201.8	145.2	0.0	17.8	1,381.7
1984	16.5	18.4	11.5	53.6	62.4	291.1	261.3	333.9	425.6	14.7	0.0	14.2	1,503.2
1985	31.0	0.0	0.0	56.1	98.9	189.8	500.7	312.1	396.6	239.7	0.4	74.8	1,900.1
1986	0.0	28.7	13.1	68.4	102.1	369.6	371.6	358.5	287.7	56.3	7.1	56.3	1,719.4
1987	2.3	48.2	56.6	48.1	59.1	106.9	683.0	253.4	195.1	219.9	14.5	0.0	1,687.1
1988	1.5	23.4	72.2	54.2	138.9	172.6	391.9	358.8	193.0	14.6	0.0	95.9	1,517.0
1989	61.7	2.0	27.0	2.5	202.9	87.8	414.6	139.1	235.1	27.6	0.0	0.0	1,200.3
1990	0.0	50.8	41.8	61.5	98.7	272.1	504.9	353.2	163.3	22.4	0.0	1.5	1,570.2
1991	43.2	7.7	54.3	69.0	37.1	199.8	310.6	363.2	115.0	0.0	1.2	30.4	1,231.5
1992	9.5	14.4	0.0	32.8	143.2	151.3	369.3	266.6	154.4	48.9	15.5	0.0	1,205.9
Average	15.3	18.5	28.5	52.6	97.9	215.4	390.3	304.8	222.9	53.0	5.9	25.7	1,430.8

Station : Lubhu (No. 1061) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1976	40.4	5.8	0.0	143.8	153.5	331.3	301.9	318.5	206.8	44.0	0.0	0.0	1,546.0
1977	12.2	14.0	2.0	121.2	162.4	236.2	311.6	251.2	56.4	35.6	9.2	46.2	1,258.2
1978	0.0	18.0	59.6	60.1	102.0	287.4	360.8	440.3	182.4	116.6	0.0	2.0	1,629.2
1979	3.0	37.3	0.0	44.7	36.5	177.6	328.8	341.2	58.6	12.4	3.3	75.9	1,119.3
1980	0.0	16.0	28.2	0.0	82.6	269.9	372.0	254.9	79.6	68.0	0.0	5.3	1,176.5
1981	23.5	0.0	14.7	48.8	144.9	86.0	410.5	283.5	147.5	70.0	15.0	0.0	1,244.4
1982	14.3	14.5	39.3	70.5	46.0	137.5	283.4	282.7	155.5	10.0	33.0	2.5	1,089.2
1983	20.0	4.5	18.8	37.5	144.0	68.5	411.5	181.6	157.5	20.5	0.0	0.0	1,064.4
1984	6.0	12.0	11.0	65.0	119.5	275.0	333.5	330.5	328.5	0.0	0.0	9.0	1,490.0
1985	9.0	0.0	0.0	39.0	106.5	152.5	530.5	352.0	297.9	191.9	0.0	42.4	1,721.7
1986	0.0	10.5	6.2	90.8	117.4								
Average	11.7	12.1	16.3	65.6	110.5	202.2	364.5	303.6	167.1	56.9	6.1	18.3	1,334.8

Station : Budhanilkantha (No. 1071) Unit : mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1987				27.3			575.5	292.5	174.0	154.2	0.0		
1988	0.0	17.2	124.8	47.2	272.2	454.2	413.7	467.0	124.6		15.8		
1989	396.0	7.2	74.0	2.8	138.8	139.1	370.3		354.4	8.2	0.0	3.0	
1990	0.0	46.0	58.8	136.2	205.6	555.3	580.5	413.6	346.4	46.6	0.0	20.0	2,409.0
1991	0.0	12.0	46.2	85.8	153.2	157.8	455.2	382.4	137.0	0.7	0.2	17.2	1,447.7
1992	6.0	17.6	0.0	32.4	152.0	289.6	503.4	518.4					
Average	80.4	20.0	60.8	55.3	184.4	319.2	483.1	414.8	227.3	52.4	3.2	13.4	1,914.2

Table 4-6 Nos. of Rainy Days at Selected Rainfall Gauging Stations

Satation : Khumaltar (No. 1029) Unit : days

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1971	1	1	4	19	18	24	21	20	9	8	0	0	125
1972	0	3	4	6	7	18	23	16	11	4	2	0	94
1973	5	4	2	3	11	19	17	22	19	7	1	0	110
1974													
1975	4	4	2	5	13	9	22	15	17	3	0	0	94
1976	2	2	0	6	14	19	14	17	13	1	0	0	88
1977	2	1	3	14	11	15	24	25	12	3	1	2	113
1978	1	3	6	7	11	19	22	23	19	5	1	1	118
1979	1	2	0	7	2	16	19	18	6	5	2	4	82
1980	0	2	7	1	10	15	26	25	17	5	0	1	109
1981	3	0	7	9	16	14	25	24	15	0	3	0	116
1982	2	4	6	9	7	16	20	25	15	2	2	1	109
1983	2	1	2	10	19	11	23	20	18	10	0	1	117
1984	1	2	1	7	15	25	22	20	18	1	0	2	114
1985	3	0	1	4	14	13	27	24	16	7	0	2	111
1986	0	4	4	9	11	17	24	24	17	4	0	4	118
1987	2	5	6	8	8	12	28	23	13	5	0	1	111
1988	1	3	6	7	12	20	25	27	14	1	2	2	120
1989	2	2	2	0	13	11	19	15	22	1	0	0	87
1990	0	8	7	10	15	15	25	21	7	5	0	1	114
Average	1.7	2.7	3.7	7.4	11.9	16.2	22.4	21.3	14.6	4.1	0.7	1.2	107.9

Note : Daily rainfall >1.0mm

Satation : Kathmandu Airport (No. 1030) Unit : days

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1971	1	1	4	18	17	24	25	22	9	9	0	0	130
1972	0	4	5	4	6	16	24	17	15	4	2	0	97
1973	5	3	5	3	15	20	21	22	19	8	3	0	124
1974	2	1	3	6	10	6	23	21	15	4	0	3	94
1975	6	5	2	5	10	13	23	20	19	5	0	0	108
1976	2	3	0	7	12	19	15	25	17	5	0	0	105
1977	2	1	4	15	16	15	26	23	10	6	3	2	123
1978	2	2	5	5	15	22	25	15	16	5	0	1	113
1979	3	4	0	8	5	18	23	24	10	8	1	5	109
1980	1	4	8	2	14	19	24	22	16	6	0	1	117
1981	2	0	7	7	17	11	23	20	14	0	3	0	104
1982	3	4	6	8	6	12	17	25	14	1	1	1	98
1983	3	2	4	10	14	8	28	17	21	9	0	1	117
1984	1	3	1	9	12	19	26	18	15	2	0	1	107
1985	3	1	1	3	17	12	28	24	19	8	0	2	118
1986	0	2	5	11	10	18	22	20	15	6	0	4	113
1987	1	5	8	5	7	14	27	20	15	4	0	1	107
1988	0	3	6	6	14	19	24	23	13	2	2	3	115
1989	2	2	3	1	13	16	21	23	20	5	0	0	106
1990	0	6	6	11	10	21	24	20	12	5	0	1	116
Average	2.0	2.8	4.2	7.2	12.0	16.1	23.5	21.1	15.2	5.1	0.8	1.3	111.1

Note : Daily rainfall >1.0mm

Satation : Nagarkot (No. 1043) Unit : days

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1971						23	21	23	10	7	1	0	
1972	1	1	5	5	8	19	24	19	19	5	2	0	108
1973	4	3	5	2	13	16	22	21	24	8	4	0	122
1974	1	2	5	7	14	13	23	22	18	5	0	3	113
1975	4	3	0	4	14	12	23	18	20	5	0	0	103
1976	2	3	0	6	14	18	24	27	22	0	0	0	116
1977	2	2	1	10	20	18	27	25	17	11	3	1	137
1978	1	2	6	10	19	24	28	23	19	8	1	1	142
1979	2	3	0	8	8	18	21	22	9	8	1	3	103
1980	0	4	8	3	12	19	26	23	15	6	0	1	117
1981	2	0	4	6	9	9	21	15	12	0	2	0	80
1982	0	3	3	7	4	12	19	24	11	1	1	1	86
1983	2	1	2	9	9	8	23	15	17	9	0	1	96
1984	0	1	0	7	8	16	21	20	16	1	0	1	91
1985	2	2	0		8	16	28	20	13	10	1	0	100
1986	0	4	4	10	10	19	21	22	19	9	0	4	122
1987	0	0	0	0	0	18	28	22	17	8	0	2	95
1988	0	3	9	10	17	21	6	28	21	2	2	2	121
1989	2	3	3	1			25	21	23	4	1	0	
1990	0	3	6	12	17	19	19	22	13	10	1	1	123
Average	1.3	2.3	3.2	6.5	11.3	16.7	22.5	21.6	16.8	5.9	1.0	1.1	110.1

Note : Daily rainfall >1.0mm

Table 4-7 (1/2) Mean Monthly Air Temperature (1/2)

Station : Godavari, 1022 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	7.6	9.7	14.6	15.4	17.6	20.3	20.4	19.2	19.3	16.6	12.2	9.4
1972	8.6	8.7	15.1	17.7	21.5	21.9	21.6	20.9	19.4	15.9	12.9	11.4
1973	9.9	11.3	14.2	18.8	19.7	21.1	21.7	21.1	19.6	16.4	12.5	9.1
1974	8.2	10.8	15.1	18.8	19.7	21.4	20.8	20.8	19.2	18.4	13.2	8.0
1975	8.0	10.7	14.8	19.0	21.1	21.3	20.6	21.0	19.4	17.8	12.3	9.2
1976	8.7	11.3	15.2	18.3	19.1	20.7	21.0	20.2	19.6	16.2	14.0	9.6
1977	8.2	10.8	15.9	16.8	17.6	20.6	21.2	21.0	20.2	16.6	13.9	9.8
1978	7.4	10.2	13.1	17.6	20.4	21.0	18.7	21.6	19.9	17.3	13.3	10.8
1979	9.6	10.0	14.2	18.5	21.2	21.9	28.1	21.2	19.9	16.9	14.7	9.5
1980	8.4	10.5	14.2	20.0	20.3	21.5	21.5	21.2	19.0	15.1	13.2	10.3
1981	8.4	11.8	14.2	16.9	19.3	21.6	21.4	21.6	20.2	17.3	12.6	9.0
1982	9.4	9.4	13.8	17.5	20.7	21.4	22.0	21.6	20.0	16.6	12.6	9.6
1983	7.6	9.4	14.5	17.1	19.2	22.2	21.9	21.7	20.7	17.2	12.8	8.7
1984	7.4	10.4	16.1	18.7	20.3	21.7	21.2	21.4	18.9	18.1	12.3	9.5
1985	8.7	10.4	17.1	19.6	19.8	21.8	20.8	21.8	19.6	16.8	12.5	9.9
1986	8.7	10.8	14.8	17.6	18.8	22.0	20.4	20.0	18.1	15.3	12.9	9.4
1987	9.1	11.3	13.9	18.1	19.7	20.6	19.9	19.7	19.8	16.8	12.8	10.1
1988	9.4	11.5	14.2	18.3	20.4	21.5	22.0	21.4	20.9	17.8	13.1	10.6
1989	7.9	10.0	14.5	18.9	21.0	21.7	21.5	21.3	20.5	17.7	12.5	9.3
1990	11.0	10.3	12.8	17.3	19.7	22.6	21.5	21.7	20.6	16.9	14.2	10.7
Average	8.6	10.5	14.6	18.0	19.9	21.4	21.4	21.0	19.7	16.9	13.0	9.7

Station : Khumaltar, 1029 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	9.0	10.2	14.5	16.9	18.4	22.7	27.9	21.7	21.6	18.0	12.9	9.7
1972	9.8	9.9	15.4	17.4	22.1	23.3	23.7	23.0	21.2	17.8	13.3	9.0
1973	9.8	11.6	14.2	19.6	21.0	23.5	23.4	23.2	22.1	18.8	13.8	9.6
1974												
1975	9.0	11.2	14.5	17.2	20.6	23.2	23.0	23.4	22.7	19.1	12.9	12.1
1976	11.1	12.1	15.2	18.6	20.4	22.4	23.0	22.8	21.9	17.6	15.2	10.0
1977	8.6	11.0	15.4	17.6	18.6	22.4	23.8	23.4	22.1	18.4	16.0	10.5
1978	8.4	11.0	13.0	17.6	21.6	23.0	23.1	23.4	22.2	18.8	13.9	9.3
1979	8.6	9.2	13.4	18.5	21.2	23.0	23.5	22.3	21.3	18.1	15.2	10.5
1980	8.6	11.0	14.2	19.5	21.3	23.2	23.4	23.2	22.1	17.5	13.8	10.1
1981	8.6	11.5	14.4	17.5	20.4	23.4	23.0	23.3	22.0	18.4	13.8	9.5
1982	9.8	10.2	13.9	18.0	20.6	22.7	23.7	23.4	22.0	18.0	13.4	10.0
1983	8.0	9.7	14.1	17.0	20.4	22.9	23.9	23.5	22.6	19.2	14.2	9.2
1984	7.5	11.0	16.8	20.0	21.4	23.3	22.9	23.7	20.9	19.1	13.6	10.6
1985	9.2	11.8	18.1	20.3	21.3	23.2	22.8	23.8	21.9	18.4	14.0	11.4
1986	9.8	10.8	14.8	18.1	19.6	23.5	23.3	23.6	21.7	18.0	14.2	9.9
1987	9.1	12.1	14.5	18.4	20.7	23.4	23.4	22.9	22.6	18.6	14.5	11.5
1988	9.8	13.0	14.7	18.9	21.5	23.3	23.6	23.2	22.4	19.9	14.5	12.1
1989	8.8	10.4	15.1	19.4	21.7	23.6	22.9	23.2	22.3	20.8	13.9	10.4
1990	11.1	11.7	13.5	17.6	20.7	24.2	23.5	23.8	22.9	19.0	15.2	11.2
Average	9.2	11.0	14.7	18.3	20.7	23.2	23.6	23.2	22.0	18.6	14.1	10.3

Table 4-7 (2/2) Mean Monthly Air Temperature (2/2)

Station : Kathmandu Airport, 1030 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	9.7	11.0	15.7	17.8	20.1	22.9	23.4	23.0	22.0	18.8	13.6	10.5
1972	10.4	10.4	16.0	18.4	22.7	23.4	23.8	23.4	21.4	18.0	14.2	10.6
1973	10.3	12.2	14.8	20.4	21.3	23.0	23.8	23.4	22.2	19.2	14.0	9.8
1974	9.3	11.6	15.8	20.2	21.5	23.6	23.1	23.4	21.5	20.7	14.2	8.8
1975	8.8	11.5	15.4	19.8	21.8	23.4	22.9	23.4	21.7	20.2	13.6	10.2
1976	9.6	12.4	15.6	19.4	21.1	22.5	23.4	22.8	21.9	17.9	15.6	9.6
1977	8.6	11.6	16.2	18.2	19.6	22.8	23.8	23.3	22.2	17.8	15.2	9.9
1978	7.8	10.4	13.4	18.0	22.1	23.3	23.6	24.2	22.6	19.2	15.0	11.6
1979	10.5	11.4	15.1	20.0	23.0	24.0	24.1	23.6	22.2	19.1	16.2	11.4
1980	9.7	12.1	15.5	20.8	22.2	24.0	24.3	24.1	23.0	18.3	14.8	11.7
1981	9.8	12.6	15.2	18.4	21.2	23.6	23.8	24.1	22.6	19.4	14.8	10.8
1982	10.8	11.0	15.2	18.7	22.2	23.5	24.2	24.6	22.6	18.4	14.6	11.4
1983	8.9	10.3	14.6	17.7	21.1	24.3	24.4	24.5	23.4	19.9	15.0	10.2
1984	8.6	11.6	17.2	19.8	22.3	24.1	24.2	24.5	21.8	20.8	14.2	11.4
1985	10.3	11.9	17.7	20.4	21.8	24.1	23.4	24.5	22.5	19.1	14.6	12.0
1986	10.5	11.8	15.9	18.8	20.5	23.9	24.2	24.1	22.5	18.6	15.2	10.8
1987	10.5	13.0	15.6	19.0	21.3	23.9	23.9	23.5	22.9	19.3	15.6	12.4
1988	11.1	13.5	15.8	19.8	22.3	23.5	24.1	23.8	23.6	20.9	15.4	12.7
1989	10.1	12.0	16.3	19.3	22.7	24.2	23.8	24.4	23.8	21.0	14.9	11.3
1990	12.7	12.6	14.6	18.5	21.6	24.4	23.9	23.9	23.0	19.3	15.9	12.0
Average	9.9	11.7	15.6	19.2	21.6	23.6	23.8	23.8	22.5	19.3	14.8	10.9

Station : Nagarkot, 1043 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1976						17.8	18.6	18.3	17.6		12.8	8.8
1977	7.2	10.0	14.8	15.2	15.6	18.6	19.6	19.0	18.2	15.0	12.4	8.4
1978	6.6	8.8	11.6	15.9	17.6	18.8	18.8	19.4	18.2	16.0	11.8	9.8
1979	8.5	8.5	11.9	16.9	19.5	19.5	18.7	18.3	17.3	14.7	12.4	7.3
1980	6.4	8.4	12.2	18.6	17.6	18.5	19.2	18.4	17.7	14.2	11.6	9.0
1981	7.0	9.7	11.8	14.4	16.6	18.8	19.0	18.9	17.7	15.4	11.6	8.4
1982	8.6	8.1	11.9	15.6	18.6	18.0	19.0	19.1	17.6	15.0	11.2	8.2
1983	6.4	7.9	12.5	14.7	16.5	19.8	19.1	19.4	18.7	15.8	11.8	8.1
1984	6.4	9.4	14.4	16.7	17.4	18.5	18.2	19.2	17.2	16.3	11.3	9.0
1985	7.4	8.7	15.0		17.2	18.8	18.3	19.3	17.3	14.8	11.2	9.2
1986	8.1	9.1	12.9	15.3	16.0	19.0	19.0	18.9	17.3	14.5	11.7	8.4
1987	8.5	9.9	12.2	15.5	18.4	18.8	18.8	18.3	17.9	15.3	12.3	10.1
1988	8.6	10.5	12.6	17.2	18.3	18.8	21.8	19.1	19.0			
1989	6.5	8.6	12.6	17.2			13.1	19.5	18.1	16.1	11.1	8.5
1990												
Average	7.4	9.0	12.8	16.1	17.4	18.7	18.7	18.9	16.6	15.3	11.8	8.7

Table 4-8 (1/2) Mean Monthly Maximum Air Temperature (1/2)

Station : Godavari, 1022 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	13.7	16.6	22.1	20.1	22.5	23.1	23.3	23.1	21.6	21.6	18.2	15.9
1972	14.4	15.2	21.6	24.0	27.2	26.5	25.3	24.5	23.0	19.9	18.0	18.8
1973	16.0	17.4	20.6	25.3	24.8	24.9	25.6	24.7	22.6	20.1	17.7	15.4
1974	14.0	17.9	21.6	24.8	25.4	26.2	16.4	24.2	22.6	23.0	18.9	13.6
1975	13.5	16.8	21.6	25.8	28.4	25.7	15.8	24.8	22.9	23.0	17.7	14.5
1976	13.7	17.4	22.3	25.0	24.4	25.0	12.0	23.9	23.6	21.9	19.4	16.3
1977	14.2	17.4	23.0	23.0	23.0	25.6	15.6	25.0	24.2	21.1	18.7	15.0
1978	12.9	15.9	18.6	23.4	25.3	24.7	15.7	25.1	23.8	22.2	18.4	16.8
1979	15.3	15.6	21.2	24.8	27.6	26.3	17.0	24.6	24.1	21.6	19.5	14.1
1980	13.9	16.0	20.3	27.1	25.7	24.9	24.5	24.2	21.9	19.7	18.4	15.2
1981	13.0	17.6	19.6	22.0	23.9	25.8	24.0	24.7	23.5	22.1	17.7	13.7
1982	15.1	14.8	19.2	23.3	26.3	25.2	25.5	24.9	23.2	21.3	16.8	14.4
1983	12.5	15.4	20.9	22.8	24.0	26.9	25.2	24.9	23.9	21.2	17.3	13.9
1984	12.9	16.7	22.3	24.9	24.5	25.0	23.8	24.9	22.3	22.2	17.1	14.6
1985	13.8	16.2	23.4	25.6	24.9	25.7	23.2	24.9	22.6	20.5	17.2	14.8
1986	13.6	16.5	20.9	23.4	24.1	25.6	24.7	25.0	22.7	20.4	17.3	14.5
1987	14.3	16.7	19.5	24.0	26.0	26.2	24.1	24.2	23.8	21.3	18.3	15.8
1988	14.7	17.2	20.3	25.1	25.4	25.2	24.8	24.1	24.4	22.8	18.8	15.5
1989	12.7	16.5	20.5	25.9	26.0	25.6	24.5	24.4	23.5	22.3	17.6	14.7
1990	16.4	15.1	18.2	23.4	24.3	26.6	24.0	24.7	23.7	21.1	19.5	15.8
Average	14.0	16.4	20.9	24.2	25.2	25.5	21.8	24.5	23.2	21.5	18.1	15.2

Station : Khumaltar, 1029 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	17.0	19.0	23.3	22.9	23.8	26.4	26.4	25.1	26.2	24.3	21.1	17.0
1972	16.4	17.2	23.7	25.8	28.9	28.5	27.3	26.6	25.3	23.2	20.1	16.9
1973	17.4	20.1	22.2	28.3	26.7	27.4	27.1	26.8	25.9	23.6	21.1	17.8
1974												
1975	15.8	18.9	23.4	27.7	27.3	28.0	26.5	27.4	25.9	25.3	20.8	17.3
1976	16.6	19.5	24.1	26.9	26.2	26.5	26.5	26.3	25.9	24.4	21.9	18.5
1977	16.4	19.8	24.6	24.4	24.4	27.0	27.2	27.1	26.4	23.5	21.0	17.4
1978	15.5	18.3	20.6	24.8	26.5	27.1	26.1	27.2	26.2	24.0	20.3	18.9
1979	18.4	18.2	23.0	26.3	29.3	28.1	26.9	26.9	25.3	24.4	22.2	16.9
1980	16.9	18.4	22.4	28.8	27.3	26.9	26.6	26.7	26.0	24.1	21.9	17.9
1981	16.0	19.8	21.6	23.6	25.5	27.7	26.0	26.9	26.1	25.0	21.4	18.2
1982	18.1	17.5	21.3	25.8	27.8	27.0	27.6	27.0	25.8	24.5	20.4	17.7
1983	16.0	18.1	22.7	24.4	25.6	28.7	27.5	27.2	26.5	24.8	21.7	17.8
1984	15.7	19.8	24.9	27.4	26.4	27.1	26.1	27.6	25.1	25.1	21.3	18.8
1985	17.0	19.4	26.4	28.1	27.2	28.2	25.9	27.8	25.7	22.8	21.1	18.9
1986	17.6	18.4	23.0	24.8	25.7	28.0	26.5	27.4	25.4	23.7	21.2	18.0
1987	17.8	19.4	21.9	26.5	28.0	28.0	26.8	26.3	26.4	24.8	22.5	20.0
1988	18.2	20.9	22.3	27.2	27.4	27.9	27.2	26.8	27.2	26.2	23.2	20.5
1989	15.8	19.1	24.2	28.8	28.4	28.3	26.3	27.2	26.4	26.5	21.8	18.9
1990	19.7	18.6	20.2	25.2	26.3	28.6	26.6	27.4	26.9	24.8	23.5	19.8
Average	17.0	19.0	22.9	26.2	26.8	27.7	26.7	26.9	26.0	23.2	21.5	18.3

Table 4-8 (2/2) Mean Monthly Maximum Air Temperature (2/2)

Station : Kathmandu Airport, 1030 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	17.4	19.2	24.0	22.7	25.1	26.2	26.9	26.5	26.2	24.1	20.6	18.2
1972	17.5	17.6	24.1	26.3	29.3	28.8	27.3	27.3	25.3	23.4	21.0	19.3
1973	17.2	19.8	23.3	28.8	26.7	26.9	27.8	27.5	26.2	24.4	21.3	18.0
1974	16.8	20.1	23.9	27.3	26.8	28.2	26.3	26.6	25.4	25.8	22.3	16.5
1975	16.2	18.9	23.8	28.2	28.2	27.9	26.1	27.3	25.3	25.7	20.8	17.8
1976	16.7	19.7	24.5	27.1	26.8	26.5	27.2	26.8	26.5	25.0	22.5	18.8
1977	16.8	20.3	25.4	25.0	25.7	27.9	27.8	27.6	27.1	24.0	21.7	17.6
1978	16.1	18.7	21.6	25.6	27.2	27.4	27.4	28.4	26.7	24.6	21.0	19.8
1979	18.4	18.8	24.0	27.4	30.4	28.9	27.7	27.2	26.7	24.9	22.7	17.9
1980	17.5	19.5	23.0	29.4	28.2	27.8	27.8	27.8	26.9	24.5	22.4	19.3
1981	16.8	20.3	22.2	24.2	26.1	28.0	27.0	27.8	26.7	25.6	22.7	19.4
1982	18.9	18.5	22.8	26.5	29.9	28.5	28.7	28.9	27.3	25.6	21.3	18.8
1983	16.7	19.0	23.4	25.1	26.8	30.4	28.3	28.7	27.8	26.0	22.9	18.9
1984	17.1	20.7	26.0	28.3	27.5	28.2	28.1	29.2	26.3	27.2	22.6	19.4
1985	18.1	20.1	26.3	28.6	28.0	28.9	27.1	28.8	26.7	24.4	22.2	19.3
1986	18.3	20.1	24.6	26.4	27.1	28.9	28.2	28.7	26.9	24.8	22.3	18.7
1987	18.5	20.6	23.2	27.1	29.1	28.8	27.6	27.5	27.4	25.6	23.4	20.6
1988	19.1	21.6	23.9	28.6	28.9	28.4	28.3	27.9	28.6	28.4	24.4	20.3
1989	17.5	21.7	25.6	30.0	29.7	29.4	28.1	29.5	28.9	28.6	23.7	20.7
1990	22.2	19.9	22.1	26.2	27.1	29.2	27.6	28.3	27.5	25.6	24.4	20.2
Average	17.7	19.8	23.9	26.9	27.7	28.3	27.6	27.9	26.8	25.4	22.3	19.0

Station : Nagarkot, 1043 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1976						21.4	22.2	21.7	21.4		17.3	13.3
1977	11.8	15.2	20.7	20.6	20.4	23.0	23.0	22.5	22.2	19.6	17.1	13.0
1978	11.5	14.3	17.0	21.4	22.1	22.5	22.3	23.5	22.0	20.8	16.6	15.5
1979	13.4	13.8	16.6	22.9	25.6	24.1	22.2	21.7	20.9	18.5	16.3	11.2
1980	11.8	13.4	17.2	24.0	22.3	22.0	22.9	21.5	21.1	18.6	16.0	13.2
1981	11.2	14.0	16.5	18.9	21.0	22.6	22.3	22.3	21.2	19.7	16.2	12.7
1982	12.8	12.0	17.3	20.9	23.8	21.6	22.7	22.9	21.2	19.6	15.2	12.2
1983	11.2	13.0	17.9	19.6	21.2	24.5	22.6	23.2	22.0	20.4	16.8	12.5
1984	10.7	14.3	20.2	22.2	21.8	22.2	21.3	23.1	21.0	20.7	16.4	13.5
1985	12.2	14.1	20.5		22.5	23.1	21.5	23.2	20.9	18.9	16.2	13.5
1986	12.6	14.2	18.4	21.1	21.5	20.1	22.5	23.0	20.8	18.9	16.6	13.3
1987	13.8	15.2	17.6	20.2	24.0	23.3	22.2	21.8	21.7	20.3	17.7	15.1
1988	13.6	15.9	18.3	23.0	23.2	22.9	27.7	22.4	22.3			
1989	11.9	14.0	17.8	23.8			21.9	23.3	21.6	20.9	16.1	13.2
1990												
Average	12.2	14.1	18.2	21.6	22.5	22.6	22.7	22.6	21.5	19.7	16.5	13.2

Table 4-9 (1/2) Mean Monthly Minimum Air Temperature (1/2)

Station : Godavari, 1022 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	1.5	2.7	7.0	10.7	12.7	17.4	17.4	15.2	17.0	11.5	6.1	2.9
1972	2.9	2.3	8.6	11.4	15.8	17.3	18.0	17.4	15.9	12.0	7.9	4.1
1973	3.8	5.3	7.8	12.4	14.7	17.4	17.9	17.5	16.6	12.7	7.4	2.9
1974	2.5	3.8	8.6	12.8	14.0	16.7	24.1	17.4	15.7	13.8	7.5	2.4
1975	2.4	4.6	8.0	12.3	13.8	16.9	24.0	17.1	15.8	12.7	6.9	3.8
1976	3.7	5.2	8.2	11.6	13.8	16.4	24.8	16.6	15.6	10.6	8.6	2.8
1977	2.1	4.3	8.8	10.6	12.2	15.7	24.8	17.0	16.2	12.2	9.1	4.7
1978	2.0	4.4	7.6	11.7	15.5	17.4	24.8	18.1	16.0	12.4	8.2	4.8
1979	3.9	4.3	7.2	12.2	14.8	17.4	25.0	17.8	15.6	12.2	9.9	4.8
1980	2.9	4.9	8.2	13.0	14.9	18.1	18.5	18.1	16.0	10.5	7.9	5.4
1981	3.9	6.1	8.7	11.8	14.7	17.5	18.9	18.5	16.8	12.5	7.6	4.3
1982	3.7	4.1	8.4	11.7	15.1	17.6	18.6	18.4	16.7	11.9	8.5	4.9
1983	2.7	3.4	8.0	11.3	14.3	17.5	18.6	18.5	17.5	13.1	8.3	3.4
1984	1.8	4.1	9.8	12.5	16.0	18.4	18.6	17.9	15.6	13.9	7.5	4.3
1985	3.5	4.6	10.7	13.6	14.6	17.8	18.3	18.7	16.6	13.1	7.7	5.0
1986	3.6	5.0	8.6	11.7	13.5	18.3	16.0	14.9	13.4	10.2	8.4	4.3
1987	3.9	5.9	8.2	12.1	13.4	15.0	15.7	15.2	15.8	12.2	7.3	4.4
1988	4.1	5.7	8.0	11.4	15.4	17.8	19.1	18.6	17.4	12.8	7.4	5.7
1989	3.0	3.5	8.5	11.9	16.0	17.8	18.4	18.2	17.5	13.1	7.3	3.8
1990	5.5	5.4	7.3	11.1	15.1	18.6	18.9	18.6	17.5	12.7	8.8	5.5
Average	3.2	4.5	8.3	11.9	14.5	17.4	20.0	17.5	16.3	12.3	7.9	4.2

Station : Khumaltar, 1029 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	1.1	1.5	5.7	11.0	13.0	19.0	19.5	18.3	17.0	11.7	4.6	2.4
1972	3.2	2.7	7.1	9.1	15.4	18.1	20.2	19.4	17.2	12.5	6.6	1.2
1973	2.3	3.2	6.3	10.9	15.3	18.7	19.6	19.5	18.3	13.9	6.5	1.5
1974												
1975	2.2	3.6	5.6	6.8	14.0	18.4	19.4	19.4	19.5	12.9	5.0	6.9
1976	5.5	4.6	6.4	10.4	14.6	18.2	19.5	19.2	17.9	10.7	8.5	1.4
1977	0.9	2.3	6.3	10.9	12.9	17.9	20.3	19.6	17.8	13.2	11.0	3.6
1978	1.3	3.7	5.3	10.4	16.7	19.0	20.1	19.5	18.1	13.5	7.5	-0.3
1979	-1.2	0.2	3.9	10.6	13.2	17.9	20.0	17.7	16.3	11.7	8.1	4.0
1980	0.5	3.7	6.0	10.1	15.3	19.8	20.9	19.8	18.2	10.6	5.6	2.3
1981	1.2	3.2	7.2	11.4	15.4	19.2	20.0	19.7	17.9	11.8	6.1	0.8
1982	1.4	3.0	6.5	10.3	13.5	18.4	19.8	19.7	18.3	11.4	6.4	2.4
1983	0.0	1.3	5.4	9.5	15.1	17.1	20.2	19.8	18.6	13.6	6.7	0.5
1984	-0.7	2.1	8.7	12.6	16.4	19.5	19.6	19.7	16.7	13.0	5.9	2.4
1985	1.3	4.3	9.8	12.4	15.3	18.2	19.6	19.7	18.0	14.0	6.9	3.9
1986	2.0	3.3	6.6	11.3	13.5	18.9	20.0	19.8	17.9	12.3	7.2	1.7
1987	0.3	4.7	7.0	10.3	13.3	18.8	19.9	19.4	18.8	12.4	6.5	2.9
1988	1.4	5.0	7.1	10.6	15.5	18.7	19.9	19.6	17.6	13.5	5.8	3.7
1989	1.8	1.6	6.0	9.9	14.9	18.9	19.4	19.2	18.2	15.1	6.0	1.8
1990	2.5	4.8	6.8	9.9	15.1	19.8	20.4	20.1	18.8	13.2	6.9	2.5
Average	1.4	3.1	6.5	10.4	14.7	18.7	19.9	19.4	18.0	12.7	6.7	2.4

Table 4-9 (2/2) Mean Monthly Minimum Air Temperature (2/2)

Station : Kathmandu Airport, 1030 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	2.0	2.7	7.4	13.0	15.1	19.6	20.0	19.6	17.9	13.6	6.7	2.8
1972	3.2	3.1	8.0	10.5	16.1	18.1	20.2	19.4	17.6	12.5	7.3	1.9
1973	3.4	4.5	6.4	11.9	15.9	19.0	19.8	19.4	18.2	14.0	6.6	1.7
1974	1.8	3.0	7.8	13.0	16.2	18.9	19.9	20.1	17.6	15.6	6.2	1.2
1975	1.4	4.1	6.9	11.4	15.3	18.9	19.7	19.6	18.1	14.7	6.3	2.5
1976	2.6	5.2	6.8	11.6	15.4	18.5	19.5	18.8	17.3	10.8	8.4	0.5
1977	0.5	3.0	7.1	11.3	13.5	17.6	19.7	19.0	17.4	11.6	8.6	2.2
1978	-0.4	2.0	5.1	10.4	17.0	19.2	19.8	20.0	18.5	13.8	9.0	3.3
1979	2.5	4.1	6.2	12.6	15.6	19.2	20.5	20.1	17.6	13.3	9.8	5.0
1980	1.9	4.9	8.0	12.1	16.3	20.2	20.8	20.4	19.0	12.1	7.2	4.1
1981	2.9	4.8	8.2	12.5	16.3	19.1	20.6	20.4	18.6	13.3	6.8	2.1
1982	2.8	3.5	7.5	10.9	14.4	18.5	19.6	20.2	17.8	11.2	7.9	3.9
1983	1.0	1.6	5.8	10.2	15.3	18.1	20.5	20.2	19.1	13.7	7.0	1.5
1984	0.1	2.4	8.3	11.2	17.1	20.0	20.3	19.8	17.3	14.4	5.8	3.4
1985	2.4	3.7	9.0	12.1	15.5	19.2	19.6	20.2	18.3	13.7	7.0	4.8
1986	2.7	3.5	7.2	11.1	13.9	18.9	20.1	19.5	18.0	12.3	8.1	2.8
1987	2.4	5.3	8.0	10.9	13.4	19.0	20.1	19.4	18.4	12.9	7.8	4.2
1988	3.0	5.3	7.6	10.9	15.7	18.5	19.9	19.7	18.5	13.3	6.4	5.0
1989	2.7	2.3	7.0	8.6	15.6	18.9	19.5	19.2	18.6	13.3	6.0	1.8
1990	3.2	5.2	7.0	10.8	16.1	19.6	20.1	19.4	18.5	13.0	7.3	3.7
Average	2.1	3.7	7.3	11.4	15.5	19.0	20.0	19.7	18.1	13.2	7.3	2.9

Station : Nagarkot, 1043 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1976						14.2	15.1	14.9	13.8		8.4	4.3
1977	2.6	4.8	9.0	9.9	10.9	14.1	16.1	15.5	14.3	10.5	7.6	3.8
1978	1.6	3.4	6.1	10.4	13.1	15.1	15.3	15.3	14.3	11.1	7.0	4.0
1979	3.5	3.2	7.2	10.8	13.5	14.8	15.2	14.9	13.7	10.9	8.4	3.4
1980	1.1	3.3	7.1	13.3	12.8	15.0	15.6	15.4	14.3	9.8	7.3	4.8
1981	2.7	5.4	7.1	9.8	12.2	14.9	15.7	15.5	14.2	11.3	7.0	4.0
1982	4.3	4.2	6.5	10.2	13.4	14.5	15.3	15.3	13.9	10.5	7.2	4.3
1983	1.6	2.8	7.1	9.7	11.7	15.0	15.5	15.5	15.3	11.1	6.8	3.7
1984	2.0	4.5	8.5	11.1	13.1	14.8	15.0	15.3	13.3	11.8	6.3	4.5
1985	2.6	3.2	9.4		11.8	14.4	15.0	15.4	13.7	10.6	6.1	4.8
1986	3.5	3.9	7.3	9.4	10.5	14.9	15.4	14.7	13.7	10.0	6.7	3.4
1987	3.2	4.6	6.8	10.7	12.7	14.3	15.3	14.7	14.1	10.3	6.9	5.0
1988	3.6	5.1	6.9	11.4	13.3	14.6	15.9	15.7	15.7			
1989	1.1	3.2	7.3	10.5			4.3	15.6	14.6	11.2	6.0	3.7
1990												
Average	2.6	4.0	7.4	10.6	12.4	14.7	14.6	15.3	14.2	10.8	7.1	4.1

Table 4-10 (1/2) Monthly Absolute Maximum Air Temperature (1/2)

Station : Godavari, 1022 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	15.6	21.1	25.0	25.0	25.0	25.6	25.0	25.0	24.4	25.0	19.4	18.9
1972	17.8	23.3	25.5	27.3	29.7	30.5	28.0	27.3	26.3	24.4	22.6	20.5
1973	18.5	20.0	25.9	29.6	28.6	27.6	28.0	28.3	26.1	25.5	20.9	19.3
1974	16.3	23.5	26.0	29.0	28.3	28.6	20.8	27.2	25.7	25.5	21.9	16.6
1975	16.7	20.9	24.9	29.2	28.3	28.6	20.6	27.2	25.3	24.5	19.8	19.2
1976	16.7	22.6	25.6	27.2	27.3	27.5	21.0	26.2	26.0	23.8	22.7	20.2
1977	17.3	21.3	26.0	27.6	28.9	28.9	21.2	27.0	26.2	23.6	20.9	17.3
1978	18.6	20.1	21.5	25.9	30.2	26.7	18.7	26.9	25.8	24.3	21.3	20.8
1979	18.8	20.0	24.9	28.4	29.7	30.8	28.1	26.9	26.0	24.7	21.4	17.0
1980	16.1	20.6	25.7	29.8	28.3	27.6	26.7	26.0	26.3	23.5	20.9	17.7
1981	17.8	22.0	22.4	24.8	26.0	28.8	26.4	27.2	26.0	24.0	21.5	16.8
1982	18.3	20.0	22.7	26.5	29.2	28.0	28.0	26.4	26.5	23.8	19.7	18.2
1983	15.5	21.3	24.9	26.5	27.2	30.1	27.6	26.8	25.9	25.4	21.0	16.2
1984	15.6	20.6	25.5	28.8	29.2	28.8	25.7	27.2	24.2	24.8	19.2	17.4
1985	16.4	20.4	27.7	28.4	29.5	27.4	25.2	27.5	25.4	24.4	20.2	19.2
1986	17.0	20.0	27.4	26.6	28.8	28.5	27.5	27.6	26.0	23.0	20.0	19.3
1987	16.3	20.6	24.5	27.0	29.6	29.0	27.5	27.8	26.0	23.8	20.8	18.5
1988	17.8	20.4	24.4	29.2	29.5	27.4	26.5	26.0	26.5	26.5	21.3	20.0
1989	16.2	22.2	26.4	29.2	31.6	28.8	28.4	26.5	26.9	25.2	20.4	18.2
1990	20.8	18.7	23.4	27.5	27.4	29.2	26.7	26.2	27.2	25.0	22.5	17.6
Average	17.2	21.0	25.0	27.7	28.6	28.4	25.4	26.9	25.9	24.5	20.9	18.4

Station : Khumaltar, 1029 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	21.0	23.5	27.5	27.0	27.5	28.0	28.5	28.5	28.5	28.0	23.0	21.5
1972	19.0	24.0	27.1	29.7	31.9	32.5	31.5	29.4	28.0	26.2	23.0	22.3
1973	19.5	23.5	27.7	31.0	29.9	29.0	29.0	29.0	28.8	26.9	23.5	19.8
1974												
1975	19.0	23.0	26.7	31.0	30.4	31.6	29.8	29.4	27.9	27.8	25.2	22.4
1976	19.0	24.0	27.4	29.5	28.5	28.9	28.4	29.0	27.2	26.1	25.7	21.2
1977	18.9	23.2	28.0	27.4	30.0	29.9	29.5	28.5	28.7	25.9	24.0	21.1
1978	20.0	23.0	23.5	27.0	31.0	29.9	28.0	29.0	28.7	26.2	24.0	22.5
1979	21.0	22.0	26.7	29.7	32.0	32.9	30.0	29.0	27.9	27.9	25.0	20.0
1980	18.9	21.5	27.0	31.0	30.0	28.9	30.0	28.9	28.2	26.0	25.0	21.5
1981	21.9	24.0	24.5	26.1	28.9	31.0	28.0	29.2	29.5	26.9	26.0	22.0
1982	20.4	22.9	25.5	29.0	31.0	29.2	29.5	29.0	30.0	25.9	24.5	22.0
1983	19.0	24.0	26.5	27.6	28.9	32.0	29.5	28.0	28.2	29.0	24.9	20.0
1984	19.5	23.0	28.0	31.0	31.0	30.8	28.0	30.0	28.0	26.8	24.0	21.5
1985	19.9	24.0	29.0	31.0	30.8	31.9	29.9	30.0	29.2	27.0	25.0	21.5
1986	20.0	22.0	29.0	28.0	28.0	30.0	29.2	29.5	28.0	26.0	24.0	23.0
1987	20.0	23.2	26.0	28.5	32.0	31.0	29.5	30.0	28.0	27.0	25.0	22.8
1988	20.0	23.0	25.0	31.0	31.0	30.0	29.0	29.0	29.0	28.0	25.0	24.0
1989	19.0	25.0	28.5	31.0	34.0	31.9	30.0	29.0	29.0	28.5	25.5	22.0
1990	23.2	26.8	25.2	29.0	29.5	30.4	29.0	29.5	30.6	28.0	26.0	22.0
Average	20.0	23.5	26.8	29.2	30.3	30.5	29.3	29.2	28.6	27.1	24.6	21.7

Table 4-10 (2/2) Monthly Absolute Maximum Air Temperature (2/2)

Station : Kathmandu Airport, 1030 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	21.0	22.9	27.7	27.0	28.2	28.8	29.6	28.2	28.5	28.4	23.2	21.0
1972	20.2	24.8	27.3	30.4	32.4	33.0	30.6	29.6	29.0	27.6	23.9	22.8
1973	19.6	22.5	29.9	31.7	29.9	29.3	29.2	30.9	29.4	27.4	24.0	20.8
1974	19.7	25.2	27.9	31.7	30.4	30.6	29.4	28.8	28.0	27.8	25.5	19.2
1975	19.5	23.4	26.9	31.0	30.6	31.4	28.8	29.6	28.4	27.8	23.0	21.5
1976	18.8	24.0	27.8	29.5	29.8	29.2	29.3	28.5	28.0	26.5	25.8	21.2
1977	19.4	24.3	28.2	29.0	30.8	31.4	29.9	29.8	29.2	26.4	24.7	21.7
1978	19.4	23.7	24.6	28.2	31.0	29.0	29.5	31.0	29.0	27.0	24.4	23.7
1979	21.8	22.8	27.3	30.6	33.0	34.0	31.3	30.4	29.0	28.8	25.8	21.0
1980	19.1	22.8	28.2	32.3	30.6	29.6	30.1	29.4	29.1	26.8	25.3	21.8
1981	22.0	24.5	24.8	27.0	29.2	31.2	29.2	30.0	29.2	26.9	25.6	22.4
1982	22.0	22.7	26.4	28.6	32.9	31.0	30.2	30.8	31.2	28.4	25.5	21.5
1983	20.2	24.4	27.4	28.4	30.2	33.7	30.4	30.6	29.6	29.2	26.4	21.5
1984	20.8	24.8	28.8	31.8	31.6	32.0	29.8	31.5	29.0	29.8	25.5	22.3
1985	20.7	23.8	28.6	31.6	31.7	30.6	29.4	30.9	29.9	28.6	26.2	22.2
1986	21.2	23.4	30.6	29.6	29.4	32.0	30.2	30.8	30.4	27.4	25.2	24.0
1987	21.4	25.2	26.6	29.8	32.7	32.4	30.6	31.2	29.3	28.3	25.8	23.1
1988	22.0	24.2	28.4	32.4	32.5	31.3	29.8	30.2	31.0	30.3	26.6	25.2
1989	20.6	20.7	30.8	33.3	36.6	32.5	32.7	31.6	32.2	31.9	26.2	24.4
1990	27.6	25.0	27.6	31.5	31.0	30.9	29.7	31.0	31.0	29.5	27.3	23.0
Average	20.9	23.8	27.8	30.3	31.2	31.2	30.0	30.2	29.5	28.2	25.3	22.2

Station : Nagarkot, 1043 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1976						24.0	24.3	24.0	23.2		21.6	15.8
1977	16.2	19.3	24.3	25.8	24.6	27.5	25.7	25.7	26.7	22.6	20.0	17.2
1978	14.7	20.2	21.6	24.1	28.1	24.3	26.0	25.6	24.6	25.4	21.1	21.5
1979	17.7	17.7	24.6	27.3	29.1	30.1	27.5	26.6	24.0	22.5	19.5	14.4
1980	14.1	18.9	22.5	28.0	25.0	24.5	25.3	25.0	24.3	21.6	19.5	15.6
1981	17.6	17.6	20.5	22.0	23.5	27.5	25.0	25.6	26.2	22.5	18.6	15.5
1982	15.7	16.0	21.7	25.0	26.7	27.0	28.0	26.0	25.5	23.0	23.8	14.8
1983	14.5	17.1	22.7	22.6	25.7	27.4	25.2	25.8	24.6	24.7	20.0	16.8
1984	15.5	18.8	23.7	26.9	27.0	26.3	24.0	26.4	24.2	24.0	19.5	17.7
1985	15.5	18.0	20.2		28.0	26.3	24.4	25.9	24.9	23.1	18.8	16.8
1986	15.5	16.5	24.4	26.3	24.8	27.1	24.6	26.2	25.0	21.7	19.5	19.0
1987	17.5	25.7	23.7	25.8	28.2	26.5	25.3	27.2	25.2	24.0	21.0	19.5
1988	16.8	19.7	22.8	27.8	26.6	26.0	26.0	26.3	25.5			
1989	17.5	19.2	21.8	27.6			26.4	29.5	25.5	24.9	20.5	18.0
1990												
Average	16.1	18.8	22.7	25.8	26.4	26.5	25.6	26.1	25.0	23.3	20.3	17.1

Table 4-11 (1/2) Monthly Absolute Minimum Air Temperature (1/2)

Station : Godavari, 1022 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	-2.2	-1.1	1.1	8.3	8.9	15.6	16.1	13.3	14.4	8.3	3.9	1.1
1972	0.0	-0.6	1.1	8.0	10.4	14.8	17.2	16.0	13.1	7.4	4.9	2.0
1973	1.0	2.7	2.8	10.5	11.8	15.0	28.0	15.5	13.1	9.5	5.0	1.5
1974	-1.1	-0.7	6.4	8.8	10.4	12.5	26.5	16.0	12.8	9.2	6.0	0.3
1975	0.5	1.5	6.1	9.5	10.1	13.5	26.7	16.0	13.9	9.4	3.3	2.6
1976	1.1	2.1	4.0	9.3	10.9	13.5	27.0	11.6	13.5	8.3	3.3	0.4
1977	-1.7	0.1	6.3	7.7	7.0	12.2	27.3	15.8	14.9	9.0	6.3	0.9
1978	-0.8	1.1	3.8	5.4	9.3	10.4	26.7	16.5	10.6	9.3	4.1	2.4
1979	2.0	1.7	1.5	7.1	12.3	15.4	14.8	16.4	13.5	9.3	7.3	1.5
1980	1.2	1.1	2.4	10.0	11.9	16.1	15.3	12.5	12.7	7.1	6.1	3.6
1981	0.9	3.2	5.0	8.0	12.0	12.0	18.0	17.0	14.6	9.2	5.2	2.0
1982	0.2	1.0	3.4	10.2	13.0	15.8	17.2	16.4	12.5	8.5	4.2	3.0
1983	-0.8	0.0	4.5	6.5	10.4	13.4	17.4	17.4	15.3	9.5	5.7	1.0
1984	0.0	1.6	6.0	8.4	11.6	17.2	17.2	16.8	12.5	10.2	5.5	2.4
1985	0.3	2.8	7.8	10.4	9.8	15.5	17.5	17.0	14.0	9.1	5.5	0.5
1986	1.6	3.2	5.3	5.4	10.4	15.2	14.2	13.5	11.0	7.0	5.2	2.2
1987	0.4	1.5	3.5	9.2	9.0	10.6	14.5	12.5	13.0	9.5	5.0	1.0
1988	0.0	3.2	4.5	5.6	12.5	14.5	17.9	16.0	14.3	10.4	4.6	2.8
1989	-0.7	-0.7	5.5	8.8	12.5	15.2	16.8	16.8	15.5	8.5	4.0	1.0
1990	1.8	3.5	4.5	5.4	10.5	16.2	17.8	17.8	16.0	9.0	6.8	3.9
Average	0.2	1.4	4.3	8.1	10.7	14.2	19.7	15.5	13.6	8.9	5.1	1.8

Station : Khumaltar, 1029 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	-3.5	-2.5	-1.0	7.5	11.0	15.5	18.5	14.0	14.0	6.5	0.2	0.0
1972	0.9	0.1	-1.0	6.0	10.0	13.2	18.9	17.1	14.0	8.5	3.0	-1.8
1973	0.5	1.0	1.0	8.0	11.0	15.0	14.1	18.0	15.0	9.0	3.0	-1.0
1974												
1975	0.0	0.0	2.8	2.2	10.0	14.5	18.0	14.4	13.0	7.0	0.3	0.0
1976	0.0	1.0	2.6	6.0	10.0	15.5	16.8	17.9	14.9	8.0	3.0	-2.0
1977	-2.0	-2.0	2.0	7.0	8.3	14.2	19.0	18.5	15.0	6.2	6.5	0.0
1978	-2.7	0.0	2.0	4.0	13.0	16.0	18.2	17.0	16.0	9.0	1.0	-3.0
1979	-4.0	-3.0	-2.0	7.0	8.0	12.3	18.9	18.0	12.0	8.0	5.0	-2.0
1980	-3.0	-1.0	0.2	7.0	11.5	17.0	19.4	18.4	15.5	5.9	3.0	-1.0
1981	-3.0	-1.0	2.5	7.0	11.0	16.4	18.9	18.0	15.0	7.0	1.0	-1.0
1982	-2.0	-0.8	2.0	7.0	10.0	16.0	18.0	18.0	11.5	6.8	1.5	-2.0
1983	-4.0	-2.5	2.0	5.0	11.0	10.0	18.0	18.0	16.0	7.5	3.0	-2.0
1984	-3.0	-2.0	4.0	10.0	12.0	18.0	14.5	18.0	10.4	8.5	3.0	-1.0
1985	-3.0	1.0	5.0	8.0	10.0	15.0	18.8	18.0	15.0	7.5	3.0	1.5
1986	-1.0	-1.5	3.0	6.5	9.0	12.0	18.0	18.0	15.0	8.0	5.0	-1.0
1987	-3.0	-1.0	3.0	6.0	8.5	15.0	19.0	17.8	14.8	9.5	4.0	-1.5
1988	-3.0	0.5	3.5	4.0	11.0	14.0	18.0	18.0	14.0	10.0	3.0	1.0
1989	-3.0	-2.5	1.5	7.0	8.0	15.0	17.5	17.5	16.0	8.5	2.0	-2.0
1990	-2.5	1.0	2.4	4.5	10.9	16.2	19.2	18.8	15.8	8.5	4.0	-0.5
Average	-2.2	-0.8	1.9	6.3	10.2	14.8	18.0	17.5	14.4	7.9	2.9	-1.0

Table 4-11 (2/2) Monthly Absolute Minimum Air Temperature (2/2)

Station : Kathmandu Airport, 1030 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1971	-1.0	-1.8	2.0	9.3	12.0	17.9	19.0	16.9	15.3	7.8	2.8	0.1
1972	-0.7	-1.2	2.0	6.8	11.0	15.2	18.8	18.0	15.6	5.8	3.1	-0.5
1973	-0.8	1.4	1.9	8.3	12.2	15.4	18.0	17.5	13.6	9.2	3.6	-1.6
1974	-2.0	-0.8	5.0	8.0	13.1	14.2	18.5	18.9	14.4	8.5	3.6	-0.9
1975	-1.7	0.2	4.6	5.9	11.4	16.0	18.0	18.2	15.9	9.4	1.3	0.0
1976	0.2	1.8	3.0	8.2	11.9	16.0	17.8	17.0	14.2	8.2	2.4	-2.0
1977	-2.4	-1.2	3.5	7.9	8.9	14.0	18.6	17.6	14.9	6.5	3.0	-2.0
1978	-3.5	2.4	0.5	3.7	14.3	16.5	18.5	18.2	16.7	8.6	3.6	0.6
1979	-0.8	0.8	1.3	8.9	10.4	14.5	19.1	18.5	14.0	9.0	7.8	0.0
1980	-1.0	0.6	3.0	7.8	12.8	17.6	19.0	19.4	16.8	7.2	5.2	0.4
1981	-1.4	0.6	4.0	7.8	12.8	14.2	19.2	18.8	16.0	9.0	2.6	0.0
1982	-0.4	0.4	2.2	7.2	10.8	11.1	19.0	17.8	11.8	7.5	3.0	-1.0
1983	-2.0	-2.2	2.6	6.4	10.8	14.4	19.2	19.2	16.6	6.6	4.2	-0.4
1984	-2.6	-0.2	3.6	6.4	11.5	18.2	19.0	13.0	12.6	9.2	3.2	1.9
1985	-1.2	1.0	6.0	8.0	11.5	15.8	18.5	18.6	15.8	8.2	4.5	2.0
1986	0.1	0.0	3.0	6.9	9.6	12.8	19.1	18.0	15.8	8.2	5.6	-0.2
1987	-0.6	1.7	3.4	5.8	8.8	15.5	18.6	16.9	13.8	10.4	5.4	0.7
1988	-0.1	2.2	3.6	5.8	11.2	15.0	18.5	19.0	15.4	9.0	4.0	2.0
1989	-2.5	-1.2	1.5	5.1	9.4	16.6	18.0	18.0	16.5	6.8	2.0	-1.3
1990	-1.5	1.0	1.4	4.6	11.5	13.6	19.0	15.1	14.2	7.6	4.5	0.5
Average	-1.3	0.3	2.9	6.9	11.3	15.2	18.7	17.7	15.0	8.1	3.8	-0.1

Station : Nagarkot, 1043 Unit : °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1976						11.9	13.6	13.8	11.2		4.5	0.7
1977	-0.5	0.5	7.1	6.8	5.3	10.0	14.6	14.4	12.8	7.4	6.0	-0.6
1978	-2.0	0.0	0.0	6.4	9.6	12.8	14.1	14.0	12.4	8.3	2.9	1.4
1979	1.2	-0.9	2.0	4.3	10.3	12.2	13.6	12.0	11.9	8.2	6.9	-0.6
1980	1.0	0.3	1.6	8.8	9.0	13.0	13.6	14.4	12.8	7.2	4.8	3.1
1981	-1.0	0.8	4.7	4.4	9.8	9.4	14.5	13.4	12.2	8.0	3.6	1.2
1982	1.4	1.0	2.0	7.0	9.4	12.6	14.4	13.0	11.2	8.3	2.8	1.0
1983	-0.4	-1.2	2.8	5.8	8.0	10.4	10.5	13.8	13.5	7.0	4.0	-0.5
1984	-0.8	0.5	5.0	7.0	9.5	12.5	14.4	13.7	10.6	8.8	4.0	2.0
1985	0.4	1.0	6.0		7.0	10.6	12.6	14.1	11.5	4.5	3.6	1.0
1986	1.0	1.6	3.8	1.8	3.5	10.7	14.0	9.0	11.2	8.0	3.2	0.2
1987	0.2	0.0	2.0	6.6	5.6	11.0	11.0	13.0	11.5	8.5	4.5	2.5
1988	0.2	1.1	2.7	7.5	8.6	10.5	14.6	13.5	14.0			
1989	-3.2	-6.0	2.8	7.2			1.0	6.5	11.6	7.0	3.5	-1.0
1990												
Average	-0.2	-0.1	3.3	6.1	8.0	11.4	12.6	12.8	12.0	7.6	4.2	0.8

Table 4-12 Monthly Relative Humidity

Station : Khumaltar, 1029 Unit : %

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1971													
1972	83	85	62	57	55	70	80	79	81	86	79	71	73.8
1973	72	69	63	54	74	79	81	80	83	79	73	67	72.6
1974													
1975		80	67	62	75	84	90	85	89	89	85	80	
1976	90	88	78	77	86	80	82	83	83	79	79	74	81.2
1977	69	60	52	71	70	74	81	79	78	75	76	80	71.9
1978	81	71	55	63	70	79	82	80	81	79	80	71	74.0
1979	73	78	54	58	54	66	78	80	79	77	75	80	70.7
1980	74	72	62		62	77	80	77	82	75	70	76	
1981	78	71	64	64	72	70	82	79	79	74	71	72	72.9
1982	73	71	57	54	54	74	78	80	80	74	74	74	70.1
1983	73	61	51	56	68	62	78	79	80	77	70	71	68.6
1984	69	67	62	57	71	80	82	78	82	77	68	70	71.8
1985	73	68	60	48	66	71	84	80	82	80	77	76	71.8
1986	74	76	58	64	65	71	79	81	80	81	79	77	73.4
1987	77	72	65	59	56	73	82	81	84	81	80	81	74.3
1988	83	78	73	59	68	74	81	82	82	79	73	79	75.8
1989	81	72	68	63	65	75	81	81	83	80	82	75	75.4
1990	74	74	71	67	71	75	84	83	85	82	77	79	76.8
Average	76	73	62	60	67	74	81	80	82	79	76	75	73.7

Station : Kathmandu (Airport) 1030 Unit : %

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1971	74	65	60	77	71	83	81	84	82	80	79	79	76.0
1972	78	70	63	52	56	68	82	81	82	81	81	78	72.4
1973	80	74	62	55	68	78	82	84	86	83	82	83	76.3
1974	82	67	68	65	72	74	85	87	88	84	81	81	77.6
1975	80	73	56	53	67	72	81	82	86	83	85	83	74.8
1976	82	72	55	56	70	77	80	84	84	80	83	78	74.9
1977	81	70	63	68	68	74	83	83	81	81	83	85	76.6
1978	80	76	67	65	74	79	82	78	85	85	86	81	77.9
1979	83	79	63	74	67	78	87	89	86	87	85	86	80.1
1980	80	71	65	53	65	78	81	81	84	82	82	83	75.3
1981	81	73	71	67	73	74	84	82	82	79	87	85	77.9
1982	82	79	66	59	53	72	77	82	84	82	86	84	75.3
1983	81	78	71	69	75	69	85	82	83	83	85	84	78.6
1984	79	73	65	55	73	80	84	81	84	80	77	80	75.7
1985	80	74	58	52	65	72	83	82	83	84	85	85	75.1
1986	81	77	61	64	66	75	83	81	84	82	85	83	76.7
1987	80	76	75	61	56	72	85	83	82	83	82	80	76.2
1988	77	72	68	57	67	75	82	84	81	82	76	80	75.2
1989	83	74	63	44	64	73	81	81	82	81	80	80	73.9
1990	75	81	69	67	69	76	83	82	82	79	78	78	76.6
Average	80	74	64	60	67	75	82	82	83	82	82	82	76.1

Station : Nagarkot 1043 Unit : %

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1976						88	91	91	91		88	58	42.3
1977	71	65	47	68	77	85	95	94	93	90	88	81	79.5
1978	72	71	66	63	88	91	93	92	95	95	90	80	82.9
1979	84	78	53	64	65	82	95	97	93	90	85	86	80.9
1980	83	81	59	49	72	93	96	97	96	87	80	79	80.7
1981	78	72	65	73	83	89	98	96	95	86	75	77	82.1
1982	70	71	69	65	61	90	95	95	94	86	90	84	80.5
1983	79	67	58	61	82	78	96	96	96	85	88	75	79.9
1984	76	70	69	59	90	96	98	94	96	89	77	71	81.9
1985	75	81	59		74	89	97	95	96	91	87	82	77.0
1986	87	83	69	84	77	87	95	94	96	90	88	73	85.1
1987	78	74	78	65	66	89	97	96	93	81	73	67	79.8
1988	74	68	64	76	90	89	93	95	90				61.7
1989													
1990													
Average	77	73	63	66	77	88	95	95	94	88	84	76	81.3

Table 4-13 Monthly Pan Evaporation

Station : Khumaltar, 1029 Unit : mm/day

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1976	2.1	2.8	4.8	5.3	4.0	4.6	4.1	4.0	3.5	3.5	2.6	2.2	3.6
1977	2.4	3.6	4.1	3.9	4.2	5.7			3.2	2.8	2.5	1.7	
1978	1.9	2.5	3.9	4.5	4.3	4.9	5.0	4.0	3.6	2.8	1.9	1.7	3.4
1979	1.6	2.2	3.8	4.2	5.2	4.7	3.9	3.4	3.1	2.7	2.2	1.5	3.2
1980	1.6	2.3	3.3	5.3	5.4	4.8	3.8	4.0	3.5	2.7	2.5	1.8	3.4
1981	1.4	2.5	3.5	3.9	4.2	4.6	3.4	3.9	3.3	4.8	2.5	1.6	3.3
1982	1.5	2.2	3.2	4.4	4.8	3.8	3.8	4.7	4.3	2.7	2.0	1.4	3.2
1983	1.7	2.2	3.9	3.6	4.2	5.2	4.3	4.6	3.7	3.2	2.1	1.5	3.4
1984	1.7	2.4	3.8	4.3	3.9	3.4	4.1	4.9	3.4	3.0	2.2	1.7	3.2
1985	1.6	2.8	4.0	5.1	4.5	4.1	3.2	4.2	3.3	2.4	1.7	1.4	3.2
1986	1.4	2.7	3.5	3.7	4.1	4.0	5.1	4.4	4.3				
Average	1.7	2.6	3.8	4.4	4.4	4.5	4.1	4.2	3.6	3.1	2.2	1.7	3.4

Station : Kathmandu (Airport) 1030 Unit : mm/day

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1976	2.3	2.9	4.8	5.2	5.4	4.4	4.2	4.5	3.6	3.5	2.5	1.9	3.8
1977	2.0	2.9	4.6	4.9	5.2	5.1	5.0	4.2	3.7	3.2	2.3	1.8	3.7
1978	1.9	2.6	3.7	4.5	4.5	4.2	3.8	4.1	3.5	3.2	2.2	1.7	3.3
1979	2.7					5.7	4.7	4.3	3.5	3.5	2.9	2.4	
1980	3.3	3.6	3.6	6.1	5.1	4.6	4.6	5.9	4.0	2.9	3.2	1.6	4.0
1981	1.9	3.1	4.0	4.4	4.0	4.9	4.6	4.9	3.7	3.5			
1982					5.8	4.3	4.5	4.5	3.9	3.2	2.4	2.0	
Average	2.4	3.0	4.1	5.0	5.0	4.7	4.5	4.6	3.7	3.3	2.6	1.9	3.7

Station : Kakani, 1007 Unit : mm/day

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1976	1.9	3.1	4.6	5.9									
1977	1.5	3.2	4.8	4.2	3.2	3.5	3.3	2.9	3.0	2.6	1.6	1.8	3.0
1978	2.0	2.7	4.3	4.2	4.5	3.8	3.5	4.0	2.7	3.1	2.0	2.3	3.3
1979	2.3	2.9	5.1	5.6		5.0	3.5	3.3	3.0	3.4	2.0	2.6	
1980			3.9	6.2	4.5	3.3	3.2	3.4	2.8	2.7	2.7	1.9	
1981	1.8	2.5	3.5	3.4	3.2	4.4	4.6	2.9	2.5	3.6	3.0	1.9	
1982													
1983	2.2	2.5	3.8	4.0	3.5	3.5	4.7	4.7	3.4	3.1	2.6	2.1	3.3
1984	2.5	3.0	3.7	4.8	3.6	2.8	3.1	3.2	3.0	2.4	2.2	2.2	3.0
1985	1.9	2.5	3.6	3.7	4.1	2.7	2.2	3.8	3.2	2.1	2.5	2.0	2.9
1986	1.7	2.8	3.6	4.6	4.2	3.9	3.2	5.0	3.0	2.5	2.0	2.2	3.2
Average	2.0	2.8	4.1	4.7	3.9	3.7	3.5	3.7	3.0	2.8	2.3	2.1	3.2

Table 4-14 Monthly Sunshine Hours

Station : Khumaltar, 1029 Unit : hrs/day

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1976		6.2	8.2	5.1	2.5		5.7		3.4	8.0	7.5	7.9	
1977	6.7	8.1	8.7	7.7	8.1	6.6	4.7	5.7	6.1	5.7			
Average	6.7	7.2	8.5	6.4	5.3	6.6	5.2	5.7	4.8	6.9	7.5	7.9	6.5

Station : Kathmandu (Airport) 1030 Unit : hrs/day

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1976	6.8	8.2	8.6	8.6	8.1	5.6	5.1	4.8	5.2	8.7	7.4	8.0	7.1
1977	6.7	8.1	8.8	8.0	9.0	7.0	5.7	6.0	6.6	6.6	7.0	6.8	7.2
1978	7.9	8.2	8.1						7.0				
1979	7.4	7.5	9.5	7.3	10.1	6.4	4.7	4.4		6.8	7.1	6.2	
1980	7.6	4.1	7.9	9.0	8.1	5.5	4.0	5.4	4.5	7.0	8.2	6.2	6.5
1981	5.5	7.4	6.2	6.8	6.1	6.1	2.8	4.8	5.3	8.2	7.8	7.4	6.2
1982	6.4	5.8	7.7	7.7	9.5	4.8	4.8	5.3	5.2	6.8	6.2	6.5	6.4
1983	6.7	8.4	8.9	6.8	7.6	8.3	5.5	5.8	6.0	7.1	7.4	7.4	7.1
1984	8.1	8.0	8.1	7.9	6.2	4.2	3.4	6.8	4.9	7.7	8.7	7.0	6.7
1985	6.5	7.1	7.1	7.1	7.4	4.8	2.6	5.3	4.6	5.2	7.4	5.4	5.9
1986	6.9	7.8	8.5	8.2	7.6	5.2	3.8	5.3		7.2	6.5	5.9	
Average	7.0	7.3	8.1	7.7	8.0	5.8	4.2	5.4	5.5	7.1	7.4	6.7	6.7

Station : Kakani 1007 Unit : hrs/day

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1976													
1977	6.4	7.7	8.4	5.6	5.7	3.2	2.0	2.6	3.1	4.5	5.0	6.2	5.0
1978	7.3	7.0	7.7	7.1	4.2	2.3	1.5		2.0	5.8	5.5	8.2	
1979	7.3	7.5	8.2		9.1								
1980			3.6	3.7	3.1	1.7	3.2	2.0	1.6	1.4	1.3		
Average	7.0	7.4	7.0	5.5	5.5	2.4	2.2	2.3	2.2	3.9	3.9	7.2	4.7

Table 4-15 Monthly Wind Speed

Station : Khumaltar, 1029 Unit : km/hr

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1976	5.1	6.6	6.9	7.0	6.9	6.3	6.7	5.6	5.5	5.1	5.3	4.5	6.0
1977	5.4	5.3	6.4	6.3	6.5	6.8	6.6	4.0	5.6	5.2	4.7	4.4	5.6
1978	4.6	5.1	5.2	5.4	6.0	6.1	6.1	5.0	4.9	4.1	4.6	3.6	5.1
1979	4.1	5.0	5.9	5.6	6.6	6.3	5.9	4.6	4.2	4.3	4.2	3.9	5.1
1980	4.2	5.3	5.5	5.9	6.6	5.9	5.7	5.4	4.0	4.3	3.7	3.3	5.0
1981	4.0	5.1	5.0	5.6	5.4	5.5	5.3	4.8	4.3	3.7	3.7	3.3	4.6
1982	3.9	4.5	5.4	5.7	5.2	5.5	5.3	4.8	3.9	3.5	3.8	3.7	4.6
1983	4.0	5.2	5.9	5.2	4.8	5.8	5.3	5.1	4.5	3.5	3.0	3.1	4.6
1984	2.2	4.3	5.4	5.0	5.1	4.6	4.8	5.6	8.0	7.4	3.4	3.5	4.9
1985	3.7	5.1	5.6	5.6	5.1	3.5	4.1	4.3	3.7	3.7	3.7	2.9	4.2
1986	3.0	4.1	4.1	4.5	4.5	4.5	4.8	3.2	3.3	2.9	2.5	2.5	3.7
Average	4.0	5.1	5.6	5.6	5.7	5.5	5.5	4.8	4.7	4.3	3.9	3.5	4.8

Station : Kathmandu (Airport) 1030 Unit : km/hr

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1985	2.6	3.3	4.6	5.5	5.2	4.2	3.5	3.3	3.0	2.6	2.4	2.2	3.5
1986	2.4	3.5	4.2	4.4	4.4	3.9	4.0	2.6	2.2	1.1	1.1	0.9	2.9
Average	2.5	3.4	4.4	5.0	4.8	4.1	3.8	3.0	2.6	1.9	1.8	1.6	3.2

Station : Kakani, 1007 Unit : km/hr

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1976	6.9	8.0	8.9	8.8	7.9	6.9	6.6	6.3	6.0	6.9	6.0	6.5	7.1
1977	6.5	5.8	9.0	8.3	7.6	7.0	3.9	5.7	5.6	5.2	5.5	6.5	6.4
1978	6.0	7.8	7.6	7.2	7.2	5.6	7.6	4.8	3.2	2.5	2.3	2.0	5.3
1979	2.2	3.9	4.2	3.5		2.6	3.4	3.2	1.4	2.0	1.2	1.3	2.4
Average	5.4	6.4	7.4	7.0	7.6	5.5	5.4	5.0	4.1	4.2	3.8	4.1	5.5

Station : Nagarkot, 1043 Unit : km/hr

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1984	5.9	6.6	7.2	8.4	7.6	6.3	4.7	5.5	6.6	6.3	4.7	5.5	6.3
1985	9.9	11.6	14.0		13.3	11.6	9.2	7.9	9.0	9.2	8.1	9.4	9.4
1986	9.0	11.6	13.8	12.7	12.0	10.1	9.0	8.3	8.8	7.2	7.9	7.2	9.8
Average	8.3	9.9	11.7	10.6	11.0	9.3	7.6	7.2	8.1	7.6	6.9	7.4	8.8

Table 4-16 (1/3) Monthly Discharge Observed at Respective Gauging Stations (1/3)

Station : Sundarijal (No. 505) C.A.= 16.5 km2 A.B.R.= 2,930 mm Unit : m3/sec

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	0.220	0.130	0.140	0.190	0.180	0.420	2.040	4.830	2.650	1.100	0.540	0.340	1.065	0.13	4.83
1964	0.230	0.150	0.110	0.110	0.140	0.287	1.680	3.854	3.649	1.298	0.620	0.471	1.050	0.11	3.85
1965	0.360	0.284	0.234	0.236	0.218	0.418	1.457	3.175	1.343	0.766	0.584	0.371	0.787	0.22	3.17
1966	0.328	0.290	0.254	0.220	0.560	1.088	2.948	5.108	3.452	1.045	0.460	0.354	1.342	0.22	5.11
1967	0.300	0.237	0.223	0.231	0.209	0.440	3.510	3.942	2.639	0.959	0.397	0.223	1.109	0.21	3.94
1968	0.144	0.108	0.129	0.122	0.098	1.143	3.801	4.445	2.790	1.515	0.528	0.277	1.258	0.10	4.44
1969	0.211	0.210	0.196	0.191	0.203	0.208	1.114	2.518	2.310	1.052	0.481	0.311	0.750	0.19	2.52
1970	0.225	0.221	0.209	0.200	0.168	0.400	2.458	4.888	2.955	1.335	0.375	0.194	1.136	0.17	4.89
1971	0.150	0.111	0.080	0.138	0.143	2.240	2.950	4.267	2.444	0.994	0.560	0.310	1.199	0.08	4.27
1972	0.223	0.190	0.187	0.157	0.190	0.390	2.290	2.835	2.825	0.863	0.493	0.309	0.913	0.16	2.84
1973	0.220	0.190	0.186	0.148	0.188	0.940	2.247				0.717	0.340			
1974	0.250	0.187	0.130	0.074	0.288	0.291	1.616	2.243	2.105	0.908	0.500	0.352	0.745	0.07	2.24
1975	0.289	0.260	0.260	0.184	0.121	0.300	0.620	0.690	1.857	1.165	0.599	0.454	0.567	0.12	1.86
1976	0.350	0.258	0.147	0.160	0.422	3.589	4.219	4.600	4.193	1.012	0.495	0.485	1.661	0.15	4.60
1977	0.379	0.335	0.253	0.360	0.431	0.835	2.793	2.915	2.018	1.285	0.904	0.743	1.104	0.25	2.91
1978	0.637	0.500	0.545	0.510	0.745	1.022	2.288	4.985	3.093	1.702	0.676	0.371	1.423	0.37	4.99
1979	0.238	0.129	0.085	0.121	0.157	0.301	1.818	2.255	2.021	0.984	0.598	0.510	0.768	0.09	2.26
1980	0.317	0.214	0.133	0.161	0.258	1.462	2.905	2.562	2.294	1.234	0.740	0.522	1.067	0.13	2.90
1981	0.333	0.259	0.258	0.273	0.390	0.720	2.179	2.774	2.141	1.066	0.642	0.438	0.956	0.26	2.77
1982	0.321	0.360	0.283	0.410	0.261	0.374	1.205	2.219	2.255	0.883	0.380	0.350	0.775	0.26	2.25
1983	0.237	0.190	0.166	0.210	0.224	0.286	2.770	3.784	3.760	2.245	1.055	0.717	1.304	0.17	3.78
1984	0.573	0.429	0.400	0.397	0.594	1.097	3.258	3.342	3.140	1.050	0.550	0.403	1.269	0.40	3.34
1985	0.400	0.250	0.206	0.215	0.342	0.560	2.110	2.828	2.980	1.430	0.734	0.476	1.044	0.21	2.98
1986	0.326	0.248	0.180	0.190	0.216	0.547	2.234	2.850	2.733	1.368	0.711	0.497	1.008	0.18	2.85
Mean	0.303	0.239	0.208	0.217	0.281	0.807	2.355	3.387	2.680	1.185	0.597	0.409	1.056	0.21	3.39
Min.	0.144	0.108	0.080	0.074	0.098	0.208	0.620	0.690	1.343	0.766	0.375	0.194	0.392	0.07	1.34
Max.	0.637	0.500	0.545	0.510	0.745	3.589	4.219	5.108	4.193	2.245	1.055	0.743	2.007	0.50	5.11

Station : Mahankal (No.507) C.A.= 13.7 km2 A.B.R.= 2,940 mm Unit : m3/sec

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	0.140	0.080	0.110	0.070	0.100	0.420	3.320	5.020	2.440	1.320	0.770	0.560	1.196	0.07	5.02
1964	0.340	0.230	0.180	0.200	0.190	0.560	2.420	3.810	3.400	1.470	0.810	0.560	1.181	0.18	3.81
1965	0.320	0.230	0.170	0.160	0.110	0.400	2.270	3.120	2.010	1.030	0.740	0.530	0.924	0.11	3.12
1966	0.390	0.250	0.180	0.140	0.370	0.620	2.470	6.370	2.690	0.780	0.610	0.480	1.279	0.14	6.37
1967	0.240	0.180	0.170	0.180	0.140	0.760	2.800	2.590	2.110	0.850	0.450	0.450	0.910	0.14	2.80
1968	0.310	0.220	0.400	0.210	0.180	1.950	3.750	4.130	2.360	1.580	0.860	0.710	1.388	0.18	4.13
1969	0.400	0.210	0.190	0.150	0.160	0.350	1.730	2.360	2.160	0.910	0.640	0.510	0.814	0.15	2.36
1970	0.340	0.240	0.190	0.160	0.210	0.960	2.170	3.380	2.180	1.340	0.720	0.500	1.033	0.16	3.38
1971	0.310	0.240	0.180	0.370	0.570	3.200	3.340	3.740	1.730	0.770	0.560	0.380	1.283	0.18	3.74
Mean	0.310	0.209	0.197	0.182	0.226	1.024	2.697	3.836	2.342	1.117	0.684	0.520	1.112	0.18	3.84
Min.	0.140	0.080	0.110	0.070	0.100	0.350	1.730	2.360	1.730	0.770	0.450	0.380	0.689	0.07	2.36
Max.	0.400	0.250	0.400	0.370	0.570	3.200	3.750	6.370	3.400	1.580	0.860	0.710	1.822	0.25	6.37

Table 4-16 (2/3) Monthly Discharge Observed at Respective Gauging Stations (2/3)

Station : Shyamdado (No.510) C.A.= 3.34 km2 A.B.R.= 2,450 mm Unit : m3/sec

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	0.062	0.041	0.035	0.029	0.028	0.121	0.241	1.069	0.709	0.181	0.107	0.076	0.225	0.03	1.07
1964	0.064	0.044	0.034	0.026	0.037	0.061	0.356	0.738	0.467	0.262	0.170	0.114	0.198	0.03	0.74
1965	0.065	0.045	0.035	0.028	0.020	0.162	0.391	0.458	0.227	0.126	0.095	0.070	0.144	0.02	0.46
1966	0.060	0.048	0.034	0.026	0.024	0.043	0.276	0.939	0.663	0.271	0.144	0.066	0.216	0.02	0.94
1967	0.045	0.033	0.031	0.036	0.019	0.086	0.585	0.498	0.450	0.218	0.127	0.057	0.182	0.02	0.59
1968	0.050	0.038	0.025	0.025	0.020	0.094	0.450	0.800	0.246	0.299	0.131	0.080	0.188	0.02	0.80
1969	0.063	0.047	0.041	0.033	0.032	0.043	0.222	0.291	0.248	0.142	0.097	0.070	0.111	0.03	0.29
1970	0.070	0.054	0.043	0.038	0.046	0.157	0.734	1.133	0.593	0.909	0.816	0.248	0.403	0.04	1.13
1971	0.077	0.063	0.052	0.063	0.058	1.200	0.928	1.360	0.563	0.255	0.162	0.079	0.405	0.05	1.36
Mean	0.062	0.046	0.037	0.034	0.032	0.219	0.465	0.810	0.463	0.296	0.205	0.096	0.230	0.03	0.81
Min.	0.045	0.033	0.025	0.025	0.019	0.043	0.222	0.291	0.227	0.126	0.095	0.057	0.101	0.02	0.29
Max.	0.077	0.063	0.052	0.063	0.058	1.200	0.928	1.360	0.709	0.909	0.816	0.248	0.540	0.05	1.36

Station : Gauri Ghat (No. 530) C.A.= 67.8 km2 A.B.R.= 2,340 mm Unit : m3/sec

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1965	0.930	0.520	0.350	0.390	0.210	1.840	7.140	11.710	3.240	1.780	1.790	1.300	2.600	0.21	11.71
1966	1.250	0.790	0.670	0.220	0.110	0.560	7.360	14.810	7.050	2.820	1.420	0.800	3.155	0.11	14.81
1967	0.620	0.310	0.370	0.480	0.170	0.890	10.920	8.260	4.590	1.470	1.230	0.930	2.520	0.17	10.92
1968	0.680	0.600	0.620	0.370	0.220	4.270	8.540	13.190	8.120	5.570	2.630	1.540	3.863	0.22	13.19
1969	0.660	0.320	0.300	0.270	0.300	0.240	2.180	6.080	6.400	3.550	2.460	1.700	2.038	0.24	6.40
1970	1.120	0.700	0.650	0.510	1.050	1.860	7.240	10.830	6.400	4.060	2.660	1.650	3.228	0.51	10.83
1971	1.060	0.660	0.600	1.520	1.430	15.910	8.440	10.150	3.780	3.050	1.980	1.320	4.158	0.60	15.91
1972	0.650	0.540	0.380	0.270		0.230					1.090	0.530			
Mean	0.871	0.555	0.493	0.504	0.499	3.225	7.403	10.719	5.654	3.186	1.908	1.221	3.020	0.49	10.72
Min.	0.620	0.310	0.300	0.220	0.110	0.230	2.180	6.080	3.240	1.470	1.090	0.530	1.365	0.11	6.08
Max.	1.250	0.790	0.670	1.520	1.430	15.910	10.920	14.810	8.120	5.570	2.660	1.700	5.446	0.67	15.91

Station : Budhanilkantha (No.536.2) C.A.= 4.43 km2 A.B.R.= 2,720 mm Unit : m3/sec

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1969	0.027	0.025	0.029	0.023	0.033	0.042	0.310	0.660	0.640	0.270	0.084	0.026	0.181	0.02	0.66
1970	0.020	0.014	0.014	0.015	0.031	0.210	0.710	1.310	1.070	0.360	0.100	0.031	0.324	0.01	1.31
1971	0.025	0.020	0.018	0.046	0.040	0.720	0.930	1.090	0.540	0.360	0.130	0.086	0.334	0.02	1.09
1972	0.064	0.076	0.085	0.087	0.087	0.190	0.860	0.700	0.820	0.240	0.120	0.092	0.285	0.06	0.86
1973	0.072	0.055	0.071	0.043	0.064	0.440	0.620	1.050	0.920	0.630	0.270	0.088	0.360	0.04	1.05
1974	0.051	0.044	0.038	0.032	0.041	0.072	0.550	0.820	0.860		0.180	0.130			
1975	0.068	0.054	0.037	0.028	0.067	0.150	1.180	0.950	1.340	0.630	0.200	0.035	0.395	0.03	1.34
1976	0.051	0.051	0.037	0.053	0.083	0.440	0.790	1.040	0.760	0.350	0.110	0.026	0.316	0.03	1.04
1977	0.044	0.019	0.024	0.041	0.110	0.150	0.310	0.540	0.380	0.180	0.120	0.080	0.167	0.02	0.54
1978	0.073	0.074	0.075	0.051	0.190	0.460	0.890	0.990	0.570	0.430	0.160	0.091	0.338	0.05	0.99
1979	0.050	0.046	0.032	0.032	0.046	0.190	0.570	0.630	0.360	0.160	0.058	0.040	0.185	0.03	0.63
1980	0.025	0.024	0.022	0.003	0.039	0.150	0.650	0.740	0.430	0.170	0.058	0.047	0.197	0.00	0.74
1981	0.033	0.015	0.010	0.023	0.064	0.190	0.470	0.880	0.760	0.280	0.150	0.077	0.246	0.01	0.88
1982	0.068	0.072	0.043	0.092	0.039	0.220	0.670	1.030	0.700	0.400	0.230	0.130	0.308	0.04	1.03
1983	0.079	0.052	0.057	0.051	0.040	0.140	0.770	1.020	1.170	0.740	0.450	0.140	0.392	0.04	1.17
1984	0.077	0.035	0.030	0.027	0.065	0.490	1.150	1.140	1.080	0.530	0.180	0.092	0.408	0.03	1.15
1985	0.050	0.035	0.029	0.030	0.059	0.048	0.660	0.960	1.140	0.570	0.360	0.170	0.343	0.03	1.14
Mean	0.052	0.042	0.038	0.040	0.065	0.253	0.711	0.915	0.796	0.394	0.174	0.081	0.297	0.04	0.91
Min.	0.020	0.014	0.010	0.003	0.031	0.042	0.310	0.540	0.360	0.160	0.058	0.026	0.131	0.00	0.54
Max.	0.079	0.076	0.085	0.092	0.190	0.720	1.180	1.310	1.340	0.740	0.450	0.170	0.536	0.08	1.34

Table 4-16 (3/3) Monthly Discharge Observed at Respective Gauging Stations (3/3)

Station : Thika Bhairaw (No.540) C.A.= 42.5 km2 A.B.R.= 2,390 mm Unit : m3/sec

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	0.210	0.057	0.200	0.140	0.130	0.110	1.390	4.030	3.580	2.070	0.400	0.240	1.046	0.06	4.03
1964	0.160	0.140	0.110	0.160	0.410	0.380	2.370	3.310	4.600	1.220	0.660	0.470	1.166	0.11	4.60
1965	0.300	0.220	0.240	0.280	0.240	0.510	6.730	6.130	1.870	0.860	0.500	0.190	1.506	0.19	6.73
1966	0.260	0.200	0.100	0.070	0.080	0.050	0.810	7.740	3.270	0.910	0.450	0.250	1.183	0.05	7.74
1967	0.140	0.060	0.150	0.220	0.080	0.170	2.420	4.050	1.900	0.790	0.250	0.180	0.868	0.06	4.05
1968	0.090	0.060	0.130	0.070	0.160	1.650	3.140	3.100	1.180	3.240	0.430	0.140	1.116	0.06	3.24
1969	0.040	0.020	0.030	0.040	0.150	0.030	1.000	3.810	2.580	0.880	0.320	0.080	0.748	0.02	3.81
1970	0.090	0.090	0.070	0.080	0.060	0.650	4.400	4.990	2.270	1.470	0.800	0.490	1.288	0.06	4.99
1971	0.300	0.280	0.330	0.280	0.330	6.700	1.930	3.300	1.850	1.110	0.820	0.540	1.481	0.28	6.70
1972	0.390	0.450	0.420	0.290	0.190	0.230	2.620	1.060	1.220	0.530	0.450	0.360	0.684	0.19	2.62
1973	0.270	0.230	0.250	0.210	0.220	2.070	2.060	1.420	2.890	2.360	0.640	0.330	1.079	0.21	2.89
1974	0.230	0.150	0.150	0.160	0.170	0.150	0.540	4.320	5.320	0.450	0.250	0.230	1.010	0.15	5.32
1975	0.160	0.110	0.100	0.100	0.120	0.250	3.300	5.620	3.650	1.800	0.680	0.420	1.359	0.10	5.62
1976	0.250	0.210	0.150	0.120	0.130	0.790	2.830	2.350	2.510	0.980	0.460	0.260	0.920	0.12	2.83
1977	0.140	0.180	0.140	0.100	0.110	0.340	1.690	1.750	1.020	0.560	0.330	0.270	0.553	0.10	1.75
1978	0.250	0.160	0.300	0.230	0.210	1.220	3.780	5.760	5.220	1.310	0.460	0.210	1.593	0.16	5.76
1979	0.140	0.110	0.140	0.090	0.050	0.040	8.960	6.280	0.570	0.090	0.080	0.080	1.386	0.04	8.96
1980	0.070	0.060	0.060	0.050	0.040	2.880	3.730	1.850	0.810	0.470	0.180	0.130	0.861	0.04	3.73
1981					0.077	0.070	0.490	0.420							
1982			0.130	0.110			0.410	0.980	2.020	0.710	0.580	0.450			
1983	0.410	0.420	0.310	0.240	0.280	1.040	4.730	4.820	3.470	1.610	1.200	0.760	1.608	0.24	4.82
1984	0.750	0.720	0.720	0.650	0.570	0.470	2.040	2.370	7.020	1.320	0.270	0.170	1.423	0.17	7.02
1985	0.160	0.110	0.076	0.051	0.099	0.160	2.300	1.860	4.810	3.950	1.410				
Mean	0.229	0.192	0.196	0.170	0.178	0.907	2.768	3.536	2.892	1.304	0.528	0.298	1.100	0.17	3.54
Min.	0.040	0.020	0.030	0.040	0.040	0.030	0.410	0.420	0.570	0.090	0.080	0.080	0.154	0.02	0.57
Max.	0.750	0.720	0.720	0.650	0.570	6.700	8.960	7.740	7.020	3.950	1.410	0.760	3.329	0.57	8.96

Station : Chobhar (No.550) C.A.= 585.0 km2 A.B.R.= 1,900 mm Unit : m3/sec

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	2.84	1.30	3.80	2.64	2.38	6.84	27.60	58.40	36.40	16.30	7.76	4.52	14.23	1.30	58.40
1964	2.67	1.56	1.05	1.74	2.30	6.86	32.50	41.40	34.60	11.90	5.87	3.50	12.16	1.05	41.40
1965	2.20	1.27	1.33	2.23	0.98	8.87	36.54	51.55	17.66	10.59	9.57	4.27	12.26	0.98	51.55
1966	3.79	2.28	0.96	0.33	1.28	2.89	29.74	66.26	23.30	7.90	4.84	3.50	12.26	0.33	66.26
1967	2.27	1.61	2.24	2.20	1.25	5.30	38.21	46.03	27.39	8.20	5.07	3.39	11.93	1.25	46.03
1968	2.70	2.10	1.24	0.77	1.34	9.68	53.17	49.24	18.84	26.59	6.54	3.46	14.64	0.77	53.17
1969	2.54	1.49	2.01	1.21	2.06	1.32	17.92	46.87	22.95	8.04	3.64	1.68	9.31	1.21	46.87
1970	1.11	1.05	0.77	0.60	0.85	7.34	57.64	58.78	43.05	19.78	8.31	3.49	16.90	0.60	58.78
1971	1.72	1.38	1.28	5.61	5.06	72.87	44.25	45.89	22.12	14.36	7.08	3.00	18.72	1.28	72.87
1972	1.53	2.05	2.46	1.68	0.73	7.88	94.52	35.99	38.83	16.38	9.67	4.74	18.04	0.73	94.52
1973	2.08	1.47	3.34	0.52	1.58	19.11	49.21	55.48	62.15	39.19	9.27	3.75	20.60	0.52	62.15
1974	1.60	0.72	0.71	1.14	4.26	2.28	47.30	79.84	61.56	15.09	7.18	4.91	18.88	0.71	79.84
1975	3.63	3.25	1.19	1.54	2.59	6.80	64.96	62.44	92.04	25.89	8.74	5.12	23.18	1.19	92.04
1976	3.41	3.17	0.88	2.70	5.76	37.60	40.77	56.31	34.01	14.24	6.57	3.50	17.41	0.88	56.31
1977	2.74	2.32	0.70	2.14	3.52	22.30	45.50	34.98	19.51	10.83	6.33	5.39	13.02	0.70	45.50
1978	3.24	1.36	1.38	2.61	5.28	23.86	61.47	80.08	39.40	31.70	9.60	4.72	22.06	1.36	80.08
1979	2.75	3.66	1.21	1.88	1.47	3.54	34.26	46.92	19.36	9.63	5.22	4.84	11.23	1.21	46.92
1980	2.39	1.13	1.32	0.51	1.78	16.43	41.28	45.32	24.08	9.34	4.36	2.38	12.53	0.51	45.32
1981	1.98	1.32	1.12	3.29	4.34	3.89	28.30	35.50	39.00						
Mean	2.48	1.82	1.53	1.86	2.57	13.98	44.48	52.49	35.59	16.44	6.98	3.90	15.34	1.53	52.49
Min.	1.11	0.72	0.70	0.33	0.73	1.32	17.92	34.98	17.66	7.90	3.64	1.68	7.39	0.33	34.98
Max.	3.79	3.66	3.80	5.61	5.76	72.87	94.52	80.08	92.04	39.19	9.67	5.39	34.70	3.66	94.52

Table 4-17 Recorded Peak Discharge of Annual Maximum Flood

Year	Stn. No. 505 Sundarijal (C.A = 17 km2)		Stn. No. 507 Mahankal (C.A = 13.7 km2)		Stn. No. 510 Shyamdado (C.A = 3.34 km2)		Stn. No. 530 Gauri Ghat (C.A = 67.8 km2)		Stn. No. 536.2 Budhanilkantha (C.A = 4.43 km2)		Stn. No. 540 Thika Bhairaw (C.A = 42.5 km2)		Stn. No. 550 Cobhar (C.A = 585 km2)	
	Discharge (m3/sec)	Date	Discharge (m3/sec)	Date	Discharge (m3/sec)	Date	Discharge (m3/sec)	Date	Discharge (m3/sec)	Date	Discharge (m3/sec)	Date	Discharge (m3/sec)	Date
1962													287.0	Aug. 8
1963	17.30	Aug. 31	16.3	Aug. 18	4.19	Aug. 31					27.9	Sep. 29	206.0	Sep. 1
1964	7.86	Aug. 30	9.5	Aug. 15	4.19	Jul. 29					20.7	Sep. 3	251.0	Sep. 3
1965	16.00	Jul. 26	17.5	Jul. 26	9.97	Jul. 26	119.0	Aug. 19			75.5	Jul. 8	395.0	Jul. 9
1966	33.10	Sep. 4	52.0	Aug. 24	10.80	Sep. 4	214.0	Aug. 24			181.0	Aug. 24	634.0	Aug. 24
1967	31.10	Jul. 10	19.2	Jul. 10	19.50	Jul. 10	236.0	Jul. 10			35.0	Jul. 10	680.0	Jul. 10
1968	26.00	Jun. 27	25.8	Jun. 27	6.73	Aug. 16	73.8	Aug. 15	3.35	Aug. 7	26.6	Oct. 5	497.0	Oct. 4
1969	6.00	Jul. 27	10.0	Jul. 22	3.73	Aug. 3	51.3	Aug. 11	1.95	Aug. 12	38.6	Aug. 21	431.0	Aug. 19
1970	41.00	Jul. 19	19.6	Jul. 28	13.20	Jun. 1	125.0	Jul. 20	7.30	Aug. 19	48.7	Jul. 16	582.0	Jul. 16
1971	9.52	Jul. 14	10.0	Jun. 10	7.54	Aug. 15	90.4	Jun. 12	3.40	Oct. 12	63.2	Jun. 12	617.0	Jun. 12
1972	7.28	Jul. 28							4.00	Jul. 28	28.0	Jul. 28	876.0	Jul. 28
1973	-	-							4.30	Aug. 11	42.4	Sep. 26	335.0	Jul. 25
1974	3.76	Sep. 2							2.60	Jul. 25	70.8	Aug. 30	350.0	Aug. 30
1975	18.20	Sep. 2							2.80	Jul. 9	52.0	Jul. 28	591.0	Aug. 3
1976	31.20	Jun. 8							3.61	Aug. 3	20.8	Jul. 2	245.0	Jun. 30
1977	16.20	Jul. 9							2.50	Jun. 24	8.7	Aug. 13	299.0	Jun. 20
1978	53.20	Aug. 25							2.70	Aug. 18	30.8	Sep. 14	407.0	Jul. 16
1979	3.26	Aug. 23							2.60	Sep. 2	75.6	Jul. 24	416.0	Aug. 21
1980	11.00	Aug. 22							1.55	Aug. 3	16.8	Jun. 19	254.0	Jul. 31
1981	16.20	Sep. 2							2.02	Aug. 15				
1982	6.16	Aug. 28							2.75	Aug. 11				
1983	20.80	Aug. 1							2.50	Aug. 2				
1984	4.76	Aug. 26							3.00	Jul. 5				
1985	7.00	Jun. 26							2.45	Aug. 5				
1986														
Max.	53.20		52.0		19.50		236.0		7.30		181.0		876.0	
Probable Flood														
10 year	38.54		43.5		18.10		261.2		5.11		110.5		728.7	
50 year	58.62		65.6		26.75		383.4		7.04		170.2		1,004.9	

Sources : DoHM and Ref.9

Table 4-18 Probable Design Flood at Intake Site of Each Irrigation Scheme

Code	Name of Schemes	Catchment Area (km2)	1/50 flood (m3/sec)	1/10 flood (m3/sec)
AK - 2	Balambu	23.0	105	68
AK - 3	Balkhu	38.0	150	96
AK - 4	Biswambhara	5.8	39	26
AK - 5	Boshan	6.8	44	29
AK - 6	Budhanilkantha	3.5	27	18
AK - 7	Dakshinkali	10.0	58	38
AK - 9	Dhulopuro	0.3	4.7	3.3
AK - 10	Gogal Indrayani	0.6	7.7	5.3
AK - 12	Gokarna	56.0	198	127
AK - 13	Ichadol	9.8	57	37
AK - 14	Indrayani	5.2	36	24
AK - 24	Pharping Dhunge Dhara	8.3	51	33
AK - 25	Shali Nadi	12.0	66	43
AK - 26	Sundarijal	34.0	139	89
AK - 27	Tokha	0.3	4.7	3.3
AB - 1	Balakhu	1.9	18	12
AB - 2	Bidol	3.6	28	19
AB - 3	Chakhu Khola	4.4	32	21
AB - 4	Dhunge Dhara	6.9	44	29
AB - 7	Ghatte Kulo			
AB - 8	Hanumante	12.0	66	43
AB - 10	Katunje	2.4	21	14
AB - 12	Kutudhal	7.3	46	30
AB - 13	Laosetar	1.6	16	11
AB - 14	Mahadev Khola	4.4	32	21
AB - 17	Nil Barahi	54.0	193	123
AB - 18	Sipadol Katunje	1.4	14	10
AB - 20	Sweety	2.7	23	15
AL - 2	Bhorle	44.0	167	107
AL - 3	Champi	43.0	164	105
AL - 5	Godawari	7.8	48	32
AL - 8	Khokana	49.0	180	115
AL - 10	Kotkhu	16.0	81	53
AL - 13	Lubhu	5.2	36	24
AL - 18	Saibu	52.0	188	120
AL - 19	Thika Bhairaw-I	39.0	153	98
	Lele Khola	17.7	87	57
	Nallu Khola	21.3	99	64
AL - 20	Thika Bhairaw-II	47.0	175	112

Table 4-19 List of Irrigation Systems in the Kathmandu Valley

Unit : ha

	Name of System	Name of Source	Command Area (Seasonal)
Kathmandu District			
AK-01	Balaju		25
AK-02	Balambu I.P	Indarawati	50
AK-03	Balkhu	Balakhu Khola	25
AK-04	Biswambhara	Gadgade Khola	80
AK-05	Bosan I.P	Bosan Khola	150
AK-06	Budhanikantha I.P	Bishunumati River	200
AK-07	Dakshinkali I.P	Karpa Khola	100
AK-09	Dhulopuco I.P	Amaleko Khahare	25
AK-10	Gogal Indrayani	Ghatte Khola	130
AK-12	Gokarna I.P	Bagmati Khola	75
AK-13	Ichadol I.P	Manamati Khola	35
AK-14	Indrayani I.P.	Ghatte Khola	100
AK-24	Pharping I.P	Karpa Khola	74
AK-25	Sali Nadi I.P	Sali Nadi	150
AK-26	Sundarijal I.P	Bagmati River	35
AK-27	Tokha I.P	Thulo Khola	100
1.	Narayan Khola I.P	Narayan Khola	20
2.	Ghatteko Kulo	Sali Nadi	20
3.	Gagalko Kulo	Manamatti Khola	15
4.	Thado Kulo I.P	Kageswaro & Dhakal Khola	60
5.	Rajkulo	Bagmati River	25
6.	Swetbarahi I.P	Salmati Khola	120
7.	Rakse Kulo	Salmati Khola	15
8.	Khahare Kulo	Khahare Khola	15
9.	Patichaur I.P	Baibu Khola	50
10.	Baluwa I.P	Thulo Khola	32
11.	Ghatte Kulo	Thulo Khola	100
12.	Pashupati I.P	Bagmati Khola	6
13.	Chunikhel I.P	Dhobi Khola	16
14.	Panchetar I.P	Jhor Khola	100
15.	Manamaiju I.P	Khahare Khola	30
16.	Lamabagar I.P	Mahadev Khola	90
17.	Alle Muhan I. System	Alle Khola	30
18.	Mahadevkhola Kulo	Mahadev Khola	15
19.	Dhungakosangu Kulo	Mahadev Khola	50
20.	Kavresthali Kulo	Mahadev Khola	55
21.	Majhako Kulo	Mahadev Khola	40
22.	Siran Kulo	Mahadev Khola	80
23.	Ichangu I.System	Dholanga Khola	50
24.	Lupang I.P	Lupang Khola	70
25.	Tersegaun Kulo	Ghatte Khola	50
26.	Ramkot I.P	Ghatte Khola	80
27.	Gahite Khola I.P	Ghatte Khola	25
28.	Manamati I.P	Manamati Khola	
29.	Thanetar Kulo	Daudale Khola	70
30.	Daudale Khola Kulo	Daudale Khola	20
31.	Thapa Dhara I.P	Thapa Dhara	30
32.	Satungal I. System	Ghatte Khola	
33.	Machhegaun I. System	Khwanglang Khola	80
34.	Thado Khola I. System	Thado Khola	10
35.	Kuthill I.P	Karpa Spring	11
36.	Simlebot Kulo	Simlebot Spring	20
37.	Kuthil Kulo	Dhanille Khola	20
38.	Satmul Kulo	Satmul Spring	25
39.	Ghatteko Kulo	Dullu KHola	30
40.	Dullu Khola I.P	Dullu KHola	25
41.	Tallo Rajkulo	Seshnaryan Spring	30
42.	Chaito I.P	Simkhet Spring	20
43.	Hisidole Rajkulo	Hisidole Spring	20
44.	Thabum Kulo	Hisidole Spring	35
	Sub-total		3,059
Lalitpur District			
AL-02	Bhorle	Nakhu Khola	150
AL-03	Champi	Nakhu Khola	100
AL-05	Godawari	Godavari Khola	175
AL-08	Khokana	Nakhu Khola	150
AL-10	Kotkhu	Godavari Khola	325
AL-13	Lubhu	Lubhu Khola	100
AL-18	Saibu	Nakhu Khola	125
AL-19	Tika Bhairaw I	Nallu & Lele	300
AL-20	Tika Bhairaw II	Nakhu Khola	200
1.	i. No. Raj Kulo	Kavre Khola	80
2.	ii. No Raj Kulo	Lele Khola	25
3.	Bhutmul Kulo	Mahat Khola	30
4.	Barah-Beshe Kulo	Mahat Khola	10
5.	Kanu Ko Dahra Kulo	Kavr Khola	4
6.	Dhara Ko Muhan Kulo	Kavr Khola	15
7.	Kailash Kulo	Kavr Khola	4
8.	3 Nos. Dungkhel Kulo	Kaphal Danda Khola	15
9.	Bhaise Kulo	Bhaise Khola	13
10.	Jamuna Kulo	Mahadev Khola	8
11.	Jor Chate Kulo	Nallu Khola	8
12.	Naya Kulo	Godavari Khola	60
13.	Dhamile Khola Kulo	Dhamile Khola	10
14.	Dhara Pani Kulo	Kodaku Khola	100
15.	Kande Pani Kulo	Kodaku Khola	75
16.	Kaule Kulo	Godavari Khola	75
17.	Moti Kulo	Godavari Khola	100
18.	Siddhipur Raj Kulo	Godavari Khola	200
19.	Baluwa Kulo	Baluwa Khola	10
20.	Khanathali Kulo Muhan	Kodaku	200
21.	Khunathali Kulo	Godavari Khola	
22.	Tar Kulo	Nallu Khola	3
23.	Kulo Tole Kholcha Kulo	Kholcha	2
24.	Nallu Khola	Nallu Khola	11
25.	3 No. Rani Kulo	Nakhu Khola	350
26.	4 No. Ghatte Kulo	Nakhu Khola	
27.	5 No. Ghatte Kulo	Nakhu Khola	
28.	Sera Kulo	Nakhu Khola	25
29.	Jhingati Kulo	Nakhu Khola	150
30.	Sano Kulo	Nakhu Khola	25
31.	Aphal Kulo	Kadaku Khola	30
32.	Takshar Kulo	Kadaku Khola	
33.	Sankhmul Kulo		
34.	Chyamdu Kulo	Kadaku Khola	
35.	Sankhmul Bagmati Kulo	Bagmati river	
36.	Khumal Kulo		
37.	Bhakhal Kulo	Nakhu Khola	
38.	Murali Kulo	Mahadev Khola	125
39.	Chalise Tarko	Lubhu Khola	10
40.	Mul Kulo		
	Sub-total		3,398
Bhaktapur District			
AB-01	Balakhu I.P.	Kalhacha Khola	60
AB-02	Bidol I.P	Saraswati Khola	100
AB-03	Chakhu I.P	Chakhu Khola	60
AB-04	Dhunge Dhara	Hanumante river	120
AB-07	Ghatte Kulo P.	Chakhu Khola	290
AB-08	Hanumante I.P	Hanumante river	150
AB-10	Katunje I.P	Budhi Ganga	100
AB-12	Khutudhal I.P	Hanumante river	100
AB-13	Lapsetar Kulo P.	Budhi Ganga	60
AB-14	Mahadev Khola I.P	Mahadev Khola	450
AB-17	Nil Balahi	Manohara river	60
AB-18	Sipadol Katunje	Chakhu Khola	100
AB-20	Sweety	Shishougari Khola	23
1.	Nanabu Kulo P.	Chakhu Khola	13
2.	Nalinchok Ko 4 no. Kulo	Doke Khola	7
3.	Raj Kulo	Manohara river	47
4.	-	Manohara river	15
5.	Kumajol ko Kulo	Monahara river	8
6.	Pakho ko Kulo	Monahara river	47
7.	-	Manohara river	7
8.	Barha Bise Kulo		35
9.	-	Manohara river	
11.	-	Monahara river	17
12.	Terso Kulo	Hanumante river	10
13.	Dhungakhani ko kulo	Mahadev Khola	4
14.	Bhairabthan ko Kulo	Mahadev Khola	11
15.	Banjh Kulo	Mahadev Khola	45
16.	Dundur Ko Kulo	Mahadev Khola	11
17.	-	Mahadev Khola	26
18.	Chakhu Kulo	Mahadev Khola	23
19.	Bedol Ko Kulo	Mahadev Khola	6
20.	-	Mungre Khola	14
21.	Reekhedo Ko Kulo	Budhi Khola	9
22.	-	Chakhu Khola	12
23.	Jagate Kulo	Kalhacha Khola	26
24.	-	Kalhacha Khola	19
25.	-	Doke Khola	3
26.	Debre Kulo	Doke Khola	38
27.	Dahine Kulo	Doke Khola	9
28.	Nallnchok Ko Kulo	Doke Khola	21
29.	Bafauta ko Mathalo Kulo	Doke Khola	9
30.	Tallo Kulo	Doke Khola	5
31.	Terso Kulo (Mahat Gaun K	Ghyampe Khola	8
32.	Kalimati Kulo	Tabyakhusi Khola	88
33.	-	Tabyakhusi Khola	46
34.	-	Tabyakhusi Khola	13
35.	Saat Talle Kulo	Tabyakhusi Khola	34
36.	-	Tabyakhusi Khola	11
37.	Hanumante Chado Ko Kulo	Trib. of Sweete Khola	27
38.	Thali Ko Kulo	Trib. of Sweete Khola	10
39.	-	Trib. of Sweete Khola	4
40.	-	Trib. of Sweete Khola	5
41.	-	Trib. of Sweete Khola	10
42.	Chalise Khola Ko Kulo	Trib. of Sweete Khola	28
43.	Daha Ko Kulo	Trib. of Sweete Khola	6
44.	Rato Pati Ko Kulo	Saraswati Khola	4
45.	Mili Kulo	Khasyang Khusung Khola	2
46.	Besi Pikhel Kulo	Khasyang Khusung Khola	46
47.	Wadaha Dovan Kulo	Khasyang Khusung Khola	19
48.	-	Khasyang Khusung Khola	11
49.	Wadaha Kulo	Khasyang Khusung Khola	5
50.	-	Trib. of Khasyang Khunsung	17
51.	Cholarpur Dol Ko Kulo	Trib. of Khasyang Khunsung	17
52.	-	Charkhande Khola	37
53.	Charkhande Kulo	Charkhande Khola	3
54.	Dhungre Kulo	Dhungre Khola	47
55.	Tauthali Ko Kulo	Trib. of Hanumante	3
	Sub-total		2,661
	Gland Total		9,118

Source : A*-**; This Study, Others ; Water Resources Inventory Study, WECS (Ref. 16, 17 and 18)

Table 4-20 List of Drinking Water Supply

(1) Municipal Water Supply

System	Intake	Water Source	River Basin
Existing and under construction			
Balaju	Pauchmani	River	Mahadev Khola
	Mahadev Khola	River	Mahadev Khola
	Allye	River	Mahadev Khola
	Boude	River	Bisnumati Khola
	Bhandare	River	Bisnumati Khola
	Chhahare	Spring	(outside valley)
Bansbari	Bisnumati (U/S)	River	Bisnumati Khola
Maharajganj	Bisnumati (D/S)	River	Bisnumati Khola
	Shivapuri		Dhobi Khola
Sundarijal	Sundarijal	Tail Water from Power Station	Bagmati River
Mahankal Chaur	Dhobi Khola	River	Dhobi Khola
Shaibu	Shesh Narayan	Spring	
	Sat Mul	Spring	
	Kutori Mul	Spring	
Sundarighat	Nakhu Khola	River	Nakhu Khola
Chapagaon	Muldore	Spring	
	Nakhu pump house	River	Nakhu Khola
Dood Pokhari	Dood Pokhari	Spring	
Lokhat	Lokhat	Spring	
Bhaktapur	Mahadev Khola	River	Hanumante River
Planed			
Manohala	Manohala	River	Manohara River
Balkhu	Balkhu Khola	River	Balkhu Khola
Lambagar	Lambagar Khola	River	Lambagar Khola

Source : Nepal Water Supply Corporation

(2) Rural Water Supply

District	Total No. of Rural Water Supply Project	Design Population (person)	Total Design Discharge (lit/sec)
Kathmandu Disctrict			
Existing	8	33,130	20.58
On-going	9	42,018	51.06
Planed	6	13,835	36.41
(Sub-total)	(23)	(88,983)	(108.05)
Bhaktapur District			
Existing	6	37,722	17.60
On-going	3	10,923	6.35
Planed	5	7,521	11.50
(Sub-total)	(14)	(56,166)	(35.45)
Lalitpur Disstrict			
Existing	5	17,116	7.56
On-going	4	30,665	3.12
Planed	2	38,358	3.49
(Sub-total)	(11)	(86,139)	(14.17)
Total	48	231,288	157.67

Source : Department of Water Supply and Sewerage

Table 4-21 (1/3) Summary of Water Resources Inventory (1/3)

Code No.	AK-01	AK-02	AK-03	AK-04	AK-05	AK-06	AK-07
Project Name	Balaju	Balambu	Balkhu	Biswambhara	Boshan	Budhanilkantha	Daksihnkali
Command Area (rainy season)	25	50	25	80 *	150 *	200	100 * *
(dry season)	20	50		60 *	125 *	150	60 *
Water Source	-	Indrawati Khola	Bhalkhu Khola	Manohara River	Boshan Khola	Bisnumati Khola	Kharpa Khola
Catchment Area (km2)	-	23	38	5.83	6.8	3.5	10
Basin Rainfall (mm/yr)		2,230	2,100	2,210	2,250	2,730	2,610
Upstream Water Use Irrigation intake		-	5 farmers' systems (170 ha)	-	-	-	AK-24 and 2 farmers' systems (114 ha)
Water supply and Hydropower generatin		-	-	-	-	Urban water supply intake	-
Discharge measurement by DOI			1.2 m3/sec (April)	0.12 m3/sec (date is not given)			
shown in WECS report				0.07 m3/sec (March)	0.05 m3/sec (April)	Low in dry season	Low in dry season
by Study team						0.07 m3/sec (May 5,1993)	
Estimated discharge given in Project request sheet (Dry season)				0.05 m3/sec			
(Rainy season)	-			-			
Estimated discharge in this study (Dry season (Feb.))	-	0.27 m3/sec	0.41 m3/sec	0.064 m3/sec	0.115 m3/sec	0.12 m3/sec	0.099 m3/sec
(Rainy season (Jun.))	-	1.4 m3/sec	1.4 m3/sec	0.215 m3/sec	0.294 m3/sec	0.29 m3/sec	0.411 m3/sec
Estimated flood discharge (1/10)	-	68 m3/sec	96 m3/sec	26 m3/sec	29 m3/sec	18 m3/sec	38 m3/sec
(1/50)	-	105 m3/sec	150 m3/sec	39 m3/sec	44 m3/sec	27 m3/sec	58 m3/sec

Code No.	AK-09	AK-10	AK-12	AK-13	AK-14	AK-24	AK-25
Project Name	Dhulopuro	Gagal Indrayani Kul	Gokarna	Ichadol	Indrayani	Pharping Dhunge Dh	Shali Nadi
Command Area (rainy season)	25	130	75	35	100 *	74	150 * *
(dry season)			60	30	73 *	60	100 *
Water Source	Dukan Khola	Ghatte Khola	Bagmati river	Tribeni Khola	Ghatte Khola	Hundu Khola	Sali Nadi
Catchment Area (km2)	0.3	0.6	56	9.8	5.2	8.3	12
Basin Rainfall (mm/yr)	2,200	2,280	2,480	1,960	2,510	2,680	2,660
Upstream Water Use Irrigation intake	-	-	AK-09, 26 and 8 farmers' systems (442 ha)	5 farmers' systems (225 ha)	1 farmers' system (15 ha)	-	1 farmers' system (20 ha)
Water supply and Hydropower generatin	-	-	-	-	-	-	-
Discharge measurement by DOI					0.07 m3/sec (date is not given)		
shown in WECS report	No water in dry season		0.3 m3/sec (March)	0.8 m3/sec (April)	0.025 m3/sec (March)	Low in dry season	0.1 m3/sec (March)
by Study team							0.11 m3/sec (Apr.27,1993) 0.83 m3/sec (Jul. 26, 1993)
Estimated discharge given in Project request sheet (Dry season)							
(Rainy season)							
Estimated discharge in this study (Dry season (Feb.))	0 m3/sec	0.01 m3/sec	0.72 m3/sec	0.12 m3/sec	0.057 m3/sec	0.14 m3/sec	0.153 m3/sec
(Rainy season (Jun.))	0.02 m3/sec	0.4 m3/sec	2.4 m3/sec	0.53 m3/sec	0.213 m3/sec	0.62 m3/sec	0.526 m3/sec
Estimated flood discharge (1/10)	3.3 m3/sec	5.3 m3/sec	127 m3/sec	37 m3/sec	24 m3/sec	33 m3/sec	43 m3/sec
(1/50)	4.7 m3/sec	7.7 m3/sec	198 m3/sec	57 m3/sec	36 m3/sec	51 m3/sec	66 m3/sec

Table 4-21 (2/3) Summary of Water Resources Inventory (2/3)

Code No.	AK-26	AK-27	AB-01	AB-02	AB-03	AB-04	AB-07
Project Name	Sundarijal	Tokha	Balakhu	Bidol	Chakhu Khola	Dhunge Dhala	Ghatte Kulo
Command Area (rainy season)	35	100	60	100 *	60	120	190 *
(dry season)	35	80	50	60 *	60	120	290
Water Source	Bagmati river	Tokha Khola	Kalca Kushi	Tholo Khola	Sipadol Khola	Ghatte Khola	Ghatte Khola
Catchment Area (km2)	34	0.3	1.9	3.6	4.4	6.9	
Basin Rainfall (mm/yr)	2,810	2,230	1,650	1,790	1,900	1,900	
Upstream Water Use							
Irrigation intake	2 farmers' systems (135 ha)	-	3 farmer's systems (122 ha)	-	AB-7,18 (290 ha)	-	AB-18 (100 ha)
Water supply and Hydropower generatin	Urban water supply intake Hydropower generation	Rural water supply intake	-	-	-	Urban water supply intake	Urban water supply intake
Discharge measurement by DOI				0.004 m3/sec (Feb.1, 1991)		0.07 m3/sec (date is not given)	
shown in WECS report	0.03 m3/sec (March)	0.045 m3/sec (April)	0.019 m3/sec (Mar.8, 1988)	0.004 m3/sec (Mar.5, 1988)	0.003 m3/sec (Mar.4, 1988)	0.012 m3/sec (Mar.5, 1988)	0.009 m3/sec (Mar.4, 1988)
by Study team	0.014 m3/sec (Apr.27, 1993)	0.004 m3/sec (May 5, 1993)				0.007 m3/sec (Apr.29, 1993) 0.16 m3/sec (Jul.26, 1993)	
Estimated discharge given in Project request sheet							
(Dry season)						0.05 m3/sec	
(Rainy season)						0.5 m3/sec	
Estimated discharge in this study							
(Dry season (Feb.))	0.5 m3/sec	0.004 m3/sec	0.02 m3/sec	0.032 m3/sec	0.05 m3/sec	0.03 m3/sec	
(Rainy season (Jun.))	1.7 m3/sec	0.02 m3/sec	0.09 m3/sec	0.108 m3/sec	0.23 m3/sec	0.31 m3/sec	
Estimated flood discharge							
(1/10)	89 m3/sec	3.3 m3/sec	12 m3/sec	19 m3/sec	21 m3/sec	29 m3/sec	
(1/50)	139 m3/sec	4.7 m3/sec	18 m3/sec	28 m3/sec	32 m3/sec	44 m3/sec	

Code No.	AB-08	AB-10	AB-12	AB-13	AB-14	AB-17	AB-18
Project Name	Hanumante	Katunje	Kutudhal	Lapsetar	Mahadev Khola	Nil Barahi	Sipadol Katunje
Command Area (rainy season)	150	100 *	100 *	60	375 *	60	100 *
(dry season)	150	100 *	80 *		300 *	40	40
Water Source	Hanumante Kh.	Ghatte Khola	Ghatte Khola	Gundu Khola	Mahadev Kh. ?	Manohara River	Sipadol Khola
Catchment Area (km2)	12	2.4	7.3	1.6	4.4	54	1.4
Basin Rainfall (mm/yr)	1,780	1,540	1,880	1,750	1,900	2,200	2,080
Upstream Water Use							
Irrigation intake	AB-04, 08 and 1 farmers' system (230 ha)	AB-13 and 1 famers' system (69 ha)	AB-04 (120 ha)	-	3 farmers systems (19 ha)	AB-10, 14 and 6 farmers' systems (578 ha)	-
Water supply and Hydropower generatin	Urban water supply intake	-	Urban water supply intake	-	-	Urban water supply intake	Rural water supply intake
Discharge measurement by DOI		0.3 m3/sec (date is not given)	0.03 m3/sec (Feb.2, 1991) 0.12 m3/sec (date is not given)		0.03 m3/sec (Jan.31, 1991) 0.07 m3/sec (date is not given)		
shown in WECS report	0.006 m3/sec (Mar.5, 1988)	0.004 m3/sec (Mar.8, 1988)		0.006 m3/sec (Mar.8, 1988)	0.062 m3/sec (Mar.2, 1988)		
by Study team		0.02 m3/sec (Apr.29, 1993)	0.009 m3/sec (Apr. 29, 1993)		0.03 m3/sec (Apr.29, 1993)		
Estimated discharge given in Project request sheet							
(Dry season)		0.02 m3/sec	0.06 m3/sec		0.1 m3/sec		
(Rainy season)		0.3 m3/sec	0.5 m3/sec		0.5 m3/sec		
Estimated discharge in this study							
(Dry season (Feb.))	0.11 m3/sec	0.011 m3/sec	0.01 m3/sec	0.02 m3/sec	0.028 m3/sec	0.61 m3/sec	0.02 m3/sec
(Rainy season (Jun.))	0.37 m3/sec	0.045 m3/sec	0.134 m3/sec	0.08 m3/sec	0.122 m3/sec	2.1 m3/sec	0.08 m3/sec
Estimated flood discharge							
(1/10)	43 m3/sec	14 m3/sec	30 m3/sec	11 m3/sec	21 m3/sec	123 m3/sec	10 m3/sec
(1/50)	66 m3/sec	21 m3/sec	46 m3/sec	16 m3/sec	32 m3/sec	193 m3/sec	14 m3/sec

Table 4-21 (3/3) Summary of Water Resources Inventory (3/3)

Code No.	AB-20	AL-02	AL-03	AL-05	AL-08	AL-10	AL-13
Project Name	Sweety	Bhorle	Chanpi	Godawari	Khokana	Kotkhu	Lubhu
Command Area (rainy season)	23	150	100	175	150	325 *	100 * *
(dry season)	23	150	100	150	150	200 *	75 *
Water Source	Shishougari Kh.	Nakhu Khola	Nakhu Khola	Godawari Khola	Nakhu Khola	Kotkhu Khola	Sineri Khola
Catchment Area (km2)	2.7	44	43	7.8	49	16	5.2
Basin Rainfall (mm/yr)	1,830	2,490	2,500	2,200	2,380	1,800	1,750
Upstream Water Use Irrigation intake	4 farmers' systems (170 ha)	AL-03, 19 and 13 farmers' systems (612 ha)	AL-19 and 13 farmers' systems (512 ha)	1 farmers' system (100 ha)	AL-02, 03, 19, 20 and 13 farmers' (962 ha)	1 farmers' system (10 ha)	1 farmers' system (10 ha)
Water supply and Hydropower generatin	-	Kakhu dam project (Water supply master plan)	Kakhu dam project (Water supply master plan)	-	-	Kotkhu dam project (Water supply) F/S level	
Discharge measurement by DOI					1.25 m3/sec (April)	2.4 m3/sec (June)	1.83 m3/sec (June)
shown in WECS report				0.99 m3/sec in rainy season			
by Study team				0.044 m3/sec (May 2, 1993)		0.19 m3/sec (May 2, 1993)	
Estimated discharge given in Project request sheet (Dry season)					1.25 m3/sec	1.26 m3/sec	0.091 m3/sec
(Rainy season)							
Estimated discharge in this study (Dry season (Feb.))	0.03 m3/sec	0.56 m3/sec	0.34 m3/sec	0.11 m3/sec	0.33 m3/sec	0.113 m3/sec	0.044 m3/sec
(Rainy season (Jun.))	0.14 m3/sec	1.9 m3/sec	0.9 m3/sec	0.48 m3/sec	0.71 m3/sec	0.429 m3/sec	0.149 m3/sec
Estimated flood dischrge (1/10)	15 m3/sec	107 m3/sec	105 m3/sec	32 m3/sec	115 m3/sec	53 m3/sec	24 m3/sec
(1/50)	23 m3/sec	167 m3/sec	164 m3/sec	48 m3/sec	180 m3/sec	81 m3/sec	36 m3/sec

Code No.	AL-18	AL-20	AL-19
Project Name	Salbu	Tika Bhairaw-II	Tika Bhairaw-I
Command Area (rainy season)	90	200 *	300 *
(dry season)	125	150 *	200 *
Water Source	Nakhu Khola	Nakhu Khola	Lele & Nallu Kh.
Catchment Area (km2)	52	47	39
Basin Rainfall (mm/yr)	2,320	2,410	2,270
Upstream Water Use Irrigation intake	AL-02, 03, 08, 19, 20 and 13 farmers' syst's. (1,112 ha)	AL-03, 19, 20 and 13 farmers' syst's. (1,112 ha)	10 farmers' systems (196 ha)
Water supply and Hydropower generatin	Kakhu dam project (Water supply master plan)	Kakhu dam project (Water supply master plan)	Kakhu dam project (Water supply master plan)
Discharge measurement by DOI		1.5 m3/sec (April)	4.75 m3/sec (June)
shown in WECS report			
by Study team		0.35 m3/sec (May. 3, 1993)	0.13 m3/sec (May. 3, 1993) 0.73 m3/sec (Jul.27, 1993)
Estimated discharge given in Project request sheet (Dry season)			0.30 m3/sec
(Rainy season)			
Estimated discharge in this study (Dry season (Feb.))	0.28 m3/sec	0.235 m3/sec	0.34 m3/sec
(Rainy season (Jun.))	0.47 m3/sec	1.565 m3/sec	1.361 m3/sec

				Lele Khola	Nallu Khola
Estimated flood discharge (1/10)	120 m3/sec	112 m3/sec	98 m3/sec	57 m3/sec	64 m3/sec
(1/50)	188 m3/sec	175 m3/sec	153 m3/sec	87 m3/sec	99 m3/sec

Note * : Command area of each scheme is nominal area registered on the list prepared by DIO.
Actual irrigation area of the selected model schemes shall be referred to the result of Water Balance of Respective Schemes shown in Table 4-26.

Table 4-22 (1/3) Monthly Specific Discharge at Respective Gauging Stations (1/3)

Station : Sundarijal (No. 505) C.A.= 16.5 km2 A.B.R.= 2,930 mm Unit : m3/sec/100km2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	1.33	0.79	0.85	1.15	1.09	2.55	12.36	29.27	16.06	6.67	3.27	2.06	6.45	0.79	29.27
1964	1.39	0.91	0.67	0.67	0.85	1.74	10.18	23.35	22.12	7.87	3.76	2.85	6.36	0.67	23.35
1965	2.18	1.72	1.42	1.43	1.32	2.54	8.83	19.24	8.14	4.65	3.54	2.25	4.77	1.32	19.24
1966	1.99	1.76	1.54	1.33	3.40	6.59	17.87	30.96	20.92	6.33	2.79	2.14	8.13	1.33	30.96
1967	1.82	1.44	1.35	1.40	1.27	2.67	21.27	23.89	16.00	5.81	2.41	1.35	6.72	1.27	23.89
1968	0.87	0.66	0.78	0.74	0.59	6.93	23.04	26.94	16.91	9.18	3.20	1.68	7.63	0.59	26.94
1969	1.28	1.27	1.19	1.16	1.23	1.26	6.75	15.26	14.00	6.37	2.92	1.88	4.55	1.16	15.26
1970	1.36	1.34	1.27	1.21	1.02	2.42	14.90	29.63	17.91	8.09	2.27	1.17	6.88	1.02	29.63
1971	0.91	0.67	0.49	0.83	0.86	13.58	17.88	25.86	14.81	6.02	3.40	1.88	7.27	0.49	25.86
1972	1.35	1.15	1.13	0.95	1.15	2.37	13.88	17.18	17.12	5.23	2.99	1.87	5.53	0.95	17.18
1973	1.33	1.15	1.13	0.90	1.14	5.70	13.62				4.35	2.06			
1974	1.52	1.13	0.79	0.45	1.74	1.76	9.79	13.60	12.76	5.50	3.03	2.13	4.52	0.45	13.60
1975	1.75	1.57	1.58	1.12	0.74	1.82	3.76	4.18	11.26	7.06	3.63	2.75	3.43	0.74	11.26
1976	2.12	1.56	0.89	0.97	2.56	21.75	25.57	27.88	25.41	6.13	3.00	2.94	10.07	0.89	27.88
1977	2.30	2.03	1.53	2.18	2.61	5.06	16.93	17.67	12.23	7.79	5.48	4.50	6.69	1.53	17.67
1978	3.86	3.03	3.30	3.09	4.52	6.19	13.87	30.21	18.75	10.31	4.10	2.25	8.62	2.25	30.21
1979	1.44	0.78	0.52	0.73	0.95	1.82	11.02	13.67	12.25	5.96	3.62	3.09	4.65	0.52	13.67
1980	1.92	1.30	0.80	0.97	1.56	8.86	17.61	15.53	13.90	7.48	4.48	3.17	6.46	0.80	17.61
1981	2.02	1.57	1.57	1.66	2.36	4.36	13.21	16.81	12.97	6.46	3.89	2.65	5.79	1.57	16.81
1982	1.94	2.18	1.71	2.48	1.58	2.27	7.30	13.45	13.66	5.35	2.30	2.12	4.70	1.58	13.66
1983	1.44	1.15	1.01	1.27	1.36	1.73	16.79	22.93	22.79	13.61	6.39	4.35	7.90	1.01	22.93
1984	3.47	2.60	2.42	2.40	3.60	6.65	19.75	20.25	19.03	6.36	3.33	2.44	7.69	2.40	20.25
1985	2.42	1.52	1.25	1.30	2.07	3.39	12.79	17.14	18.06	8.67	4.45	2.89	6.33	1.25	18.06
1986	1.98	1.50	1.09	1.15	1.31	3.31	13.54	17.27	16.57	8.29	4.31	3.01	6.11	1.09	17.27
Mean	1.83	1.45	1.26	1.31	1.70	4.89	14.27	20.53	16.24	7.18	3.62	2.48	6.40	1.26	20.53
Min.	0.87	0.66	0.49	0.45	0.59	1.26	3.76	4.18	8.14	4.65	2.27	1.17	2.37	0.45	8.14
Max.	3.86	3.03	3.30	3.09	4.52	21.75	25.57	30.96	25.41	13.61	6.39	4.50	12.17	3.03	30.96

Station : Mahankal (No.507) C.A.= 13.7 km2 A.B.R.= 2,940 mm Unit : m3/sec/100km2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	1.02	0.58	0.80	0.51	0.73	3.07	24.23	36.64	17.81	9.64	5.62	4.09	8.73	0.51	36.64
1964	2.48	1.68	1.31	1.46	1.39	4.09	17.66	27.81	24.82	10.73	5.91	4.09	8.62	1.31	27.81
1965	2.34	1.68	1.24	1.17	0.80	2.92	16.57	22.77	14.67	7.52	5.40	3.87	6.75	0.80	22.77
1966	2.85	1.82	1.31	1.02	2.70	4.53	18.03	46.50	19.64	5.69	4.45	3.50	9.34	1.02	46.50
1967	1.75	1.31	1.24	1.31	1.02	5.55	20.44	18.91	15.40	6.20	3.28	3.28	6.64	1.02	20.44
1968	2.26	1.61	2.92	1.53	1.31	14.23	27.37	30.15	17.23	11.53	6.28	5.18	10.13	1.31	30.15
1969	2.92	1.53	1.39	1.09	1.17	2.55	12.63	17.23	15.77	6.64	4.67	3.72	5.94	1.09	17.23
1970	2.48	1.75	1.39	1.17	1.53	7.01	15.84	24.67	15.91	9.78	5.26	3.65	7.54	1.17	24.67
1971	2.26	1.75	1.31	2.70	4.16	23.36	24.38	27.30	12.63	5.62	4.09	2.77	9.36	1.31	27.30
Mean	2.26	1.52	1.44	1.33	1.65	7.48	19.68	28.00	17.10	8.15	5.00	3.80	8.12	1.33	28.00
Min.	1.02	0.58	0.80	0.51	0.73	2.55	12.63	17.23	12.63	5.62	3.28	2.77	5.03	0.51	17.23
Max.	2.92	1.82	2.92	2.70	4.16	23.36	27.37	46.50	24.82	11.53	6.28	5.18	13.30	1.82	46.50

Table 4-22 (2/3) Monthly Specific Discharge at Respective Gauging Stations (2/3)

Station : Shyamdado (No.510) C.A.= 3.34 km2 A.B.R.= 2,450 mm Unit : m3/sec/100km2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	1.86	1.23	1.05	0.87	0.84	3.62	7.22	32.01	21.23	5.42	3.20	2.28	6.73	0.84	32.01
1964	1.92	1.32	1.02	0.78	1.11	1.83	10.66	22.10	13.98	7.84	5.09	3.41	5.92	0.78	22.10
1965	1.95	1.35	1.05	0.84	0.60	4.85	11.71	13.71	6.80	3.77	2.84	2.10	4.30	0.60	13.71
1966	1.80	1.44	1.02	0.78	0.72	1.29	8.26	28.11	19.85	8.11	4.31	1.98	6.47	0.72	28.11
1967	1.35	0.99	0.93	1.08	0.57	2.57	17.51	14.91	13.47	6.53	3.80	1.71	5.45	0.57	17.51
1968	1.50	1.14	0.75	0.75	0.60	2.81	13.47	23.95	7.37	8.95	3.92	2.40	5.63	0.60	23.95
1969	1.89	1.41	1.23	0.99	0.96	1.29	6.65	8.71	7.43	4.25	2.90	2.10	3.32	0.96	8.71
1970	2.10	1.62	1.29	1.14	1.38	4.70	21.98	33.92	17.75	27.22	24.43	7.43	12.08	1.14	33.92
1971	2.31	1.89	1.56	1.89	1.74	35.93	27.78	40.72	16.86	7.63	4.85	2.37	12.13	1.56	40.72
Mean	1.85	1.37	1.10	1.01	0.94	6.54	13.92	24.24	13.86	8.86	6.15	2.86	6.89	0.94	24.24
Min.	1.35	0.99	0.75	0.75	0.57	1.29	6.65	8.71	6.80	3.77	2.84	1.71	3.01	0.57	8.71
Max.	2.31	1.89	1.56	1.89	1.74	35.93	27.78	40.72	21.23	27.22	24.43	7.43	16.18	1.56	40.72

Station : Gauri Ghat (No. 530) C.A.= 67.8 km2 A.B.R.= 2,340 mm Unit : m3/sec/100km2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1965	1.37	0.77	0.52	0.58	0.31	2.71	10.53	17.27	4.78	2.63	2.64	1.92	3.83	0.31	17.27
1966	1.84	1.17	0.99	0.32	0.16	0.83	10.86	21.84	10.40	4.16	2.09	1.18	4.65	0.16	21.84
1967	0.91	0.46	0.55	0.71	0.25	1.31	16.11	12.18	6.77	2.17	1.81	1.37	3.72	0.25	16.11
1968	1.00	0.88	0.91	0.55	0.32	6.30	12.60	19.45	11.98	8.22	3.88	2.27	5.70	0.32	19.45
1969	0.97	0.47	0.44	0.40	0.44	0.35	3.22	8.97	9.44	5.24	3.63	2.51	3.01	0.35	9.44
1970	1.65	1.03	0.96	0.75	1.55	2.74	10.68	15.97	9.44	5.99	3.92	2.43	4.76	0.75	15.97
1971	1.56	0.97	0.88	2.24	2.11	23.47	12.45	14.97	5.58	4.50	2.92	1.95	6.13	0.88	23.47
1972	0.96	0.80	0.56	0.40		0.34					1.61	0.78			
Mean	1.29	0.82	0.73	0.74	0.74	4.76	10.92	15.81	8.34	4.70	2.81	1.80	4.45	0.73	15.81
Min.	0.91	0.46	0.44	0.32	0.16	0.34	3.22	8.97	4.78	2.17	1.61	0.78	2.01	0.16	8.97
Max.	1.84	1.17	0.99	2.24	2.11	23.47	16.11	21.84	11.98	8.22	3.92	2.51	8.03	0.99	23.47

Station : Budhanilkantha (No.536.2) C.A.= 4.43 km2 A.B.R.= 2,720 mm Unit : m3/sec/100km2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1969	0.61	0.56	0.65	0.52	0.74	0.95	7.00	14.90	14.45	6.09	1.90	0.59	4.08	0.52	14.90
1970	0.45	0.32	0.32	0.34	0.70	4.74	16.03	29.57	24.15	8.13	2.26	0.70	7.31	0.32	29.57
1971	0.56	0.45	0.41	1.04	0.90	16.25	20.99	24.60	12.19	8.13	2.93	1.94	7.53	0.41	24.60
1972	1.44	1.72	1.92	1.96	1.96	4.29	19.41	15.80	18.51	5.42	2.71	2.08	6.44	1.44	19.41
1973	1.63	1.24	1.60	0.97	1.44	9.93	14.00	23.70	20.77	14.22	6.09	1.99	8.13	0.97	23.70
1974	1.15	0.99	0.86	0.72	0.93	1.63	12.42	18.51	19.41		4.06	2.93			
1975	1.53	1.22	0.84	0.63	1.51	3.39	26.64	21.44	30.25	14.22	4.51	0.79	8.91	0.63	30.25
1976	1.15	1.15	0.84	1.20	1.87	9.93	17.83	23.48	17.16	7.90	2.48	0.59	7.13	0.59	23.48
1977	0.99	0.43	0.54	0.93	2.48	3.39	7.00	12.19	8.58	4.06	2.71	1.81	3.76	0.43	12.19
1978	1.65	1.67	1.69	1.15	4.29	10.38	20.09	22.35	12.87	9.71	3.61	2.05	7.63	1.15	22.35
1979	1.13	1.04	0.72	0.72	1.04	4.29	12.87	14.22	8.13	3.61	1.31	0.90	4.16	0.72	14.22
1980	0.56	0.54	0.50	0.07	0.88	3.39	14.67	16.70	9.71	3.84	1.31	1.06	4.44	0.07	16.70
1981	0.74	0.34	0.23	0.52	1.44	4.29	10.61	19.86	17.16	6.32	3.39	1.74	5.55	0.23	19.86
1982	1.53	1.63	0.97	2.08	0.88	4.97	15.12	23.25	15.80	9.03	5.19	2.93	6.95	0.88	23.25
1983	1.78	1.17	1.29	1.15	0.90	3.16	17.38	23.02	26.41	16.70	10.16	3.16	8.86	0.90	26.41
1984	1.74	0.79	0.68	0.61	1.47	11.06	25.96	25.73	24.38	11.96	4.06	2.08	9.21	0.61	25.96
1985	1.13	0.79	0.65	0.68	1.33	1.08	14.90	21.67	25.73	12.87	8.13	3.84	7.73	0.65	25.73
Mean	1.16	0.94	0.86	0.90	1.46	5.71	16.05	20.65	17.98	8.89	3.93	1.83	6.70	0.86	20.65
Min.	0.45	0.32	0.23	0.07	0.70	0.95	7.00	12.19	8.13	3.61	1.31	0.59	2.96	0.07	12.19
Max.	1.78	1.72	1.92	2.08	4.29	16.25	26.64	29.57	30.25	16.70	10.16	3.84	12.10	1.72	30.25

Table 4-22 (3/3) Monthly Specific Discharge at Respective Gauging Stations (3/3)

Station : Thika Bhairaw (No.540) C.A.= 42.5 km2 A.B.R.= 2,390 mm Unit : m3/sec/100km2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	0.49	0.13	0.47	0.33	0.31	0.26	3.27	9.48	8.42	4.87	0.94	0.56	2.46	0.13	9.48
1964	0.38	0.33	0.26	0.38	0.96	0.89	5.58	7.79	10.82	2.87	1.55	1.11	2.74	0.26	10.82
1965	0.71	0.52	0.56	0.66	0.56	1.20	15.84	14.42	4.40	2.02	1.18	0.45	3.54	0.45	15.84
1966	0.61	0.47	0.24	0.16	0.19	0.12	1.91	18.21	7.69	2.14	1.06	0.59	2.78	0.12	18.21
1967	0.33	0.14	0.35	0.52	0.19	0.40	5.69	9.53	4.47	1.86	0.59	0.42	2.04	0.14	9.53
1968	0.21	0.14	0.31	0.16	0.38	3.88	7.39	7.29	2.78	7.62	1.01	0.33	2.63	0.14	7.62
1969	0.09	0.05	0.07	0.09	0.35	0.07	2.35	8.96	6.07	2.07	0.75	0.19	1.76	0.05	8.96
1970	0.21	0.21	0.16	0.19	0.14	1.53	10.35	11.74	5.34	3.46	1.88	1.15	3.03	0.14	11.74
1971	0.71	0.66	0.78	0.66	0.78	15.76	4.54	7.76	4.35	2.61	1.93	1.27	3.48	0.66	15.76
1972	0.92	1.06	0.99	0.68	0.45	0.54	6.16	2.49	2.87	1.25	1.06	0.85	1.61	0.45	6.16
1973	0.64	0.54	0.59	0.49	0.52	4.87	4.85	3.34	6.80	5.55	1.51	0.78	2.54	0.49	6.80
1974	0.54	0.35	0.35	0.38	0.40	0.35	1.27	10.16	12.52	1.06	0.59	0.54	2.38	0.35	12.52
1975	0.38	0.26	0.24	0.24	0.28	0.59	7.76	13.22	8.59	4.24	1.60	0.99	3.20	0.24	13.22
1976	0.59	0.49	0.35	0.28	0.31	1.86	6.66	5.53	5.91	2.31	1.08	0.61	2.16	0.28	6.66
1977	0.33	0.42	0.33	0.24	0.26	0.80	3.98	4.12	2.40	1.32	0.78	0.64	1.30	0.24	4.12
1978	0.59	0.38	0.71	0.54	0.49	2.87	8.89	13.55	12.28	3.08	1.08	0.49	3.75	0.38	13.55
1979	0.33	0.26	0.33	0.21	0.12	0.09	21.08	14.78	1.34	0.21	0.19	0.19	3.26	0.09	21.08
1980	0.16	0.14	0.14	0.12	0.09	6.78	8.78	4.35	1.91	1.11	0.42	0.31	2.03	0.09	8.78
1981					0.18	0.16	1.15	0.99							
1982			0.31	0.26			0.96	2.31	4.75	1.67	1.36	1.06			
1983	0.96	0.99	0.73	0.56	0.66	2.45	11.13	11.34	8.16	3.79	2.82	1.79	3.78	0.56	11.34
1984	1.76	1.69	1.69	1.53	1.34	1.11	4.80	5.58	16.52	3.11	0.64	0.40	3.35	0.40	16.52
1985	0.38	0.26	0.18	0.12	0.23	0.38	5.41	4.38	11.32	9.29	3.32				
Mean	0.54	0.45	0.46	0.40	0.42	2.13	6.51	8.32	6.81	3.07	1.24	0.70	2.59	0.40	8.32
Min.	0.09	0.05	0.07	0.09	0.09	0.07	0.96	0.99	1.34	0.21	0.19	0.19	0.36	0.05	1.34
Max.	1.76	1.69	1.69	1.53	1.34	15.76	21.08	18.21	16.52	9.29	3.32	1.79	7.83	1.34	21.08

Station : Chobhar (No.550) C.A.= 585.0 km2 A.B.R.= 1,900 mm Unit : m3/sec/100km2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	0.49	0.22	0.65	0.45	0.41	1.17	4.72	9.98	6.22	2.79	1.33	0.77	2.43	0.22	9.98
1964	0.46	0.27	0.18	0.30	0.39	1.17	5.56	7.08	5.91	2.03	1.00	0.60	2.08	0.18	7.08
1965	0.38	0.22	0.23	0.38	0.17	1.52	6.25	8.81	3.02	1.81	1.64	0.73	2.09	0.17	8.81
1966	0.65	0.39	0.16	0.06	0.22	0.49	5.08	11.33	3.98	1.35	0.83	0.60	2.10	0.06	11.33
1967	0.39	0.28	0.38	0.38	0.21	0.91	6.53	7.87	4.68	1.40	0.87	0.58	2.04	0.21	7.87
1968	0.46	0.36	0.21	0.13	0.23	1.65	9.09	8.42	3.22	4.55	1.12	0.59	2.50	0.13	9.09
1969	0.43	0.25	0.34	0.21	0.35	0.23	3.06	8.01	3.92	1.37	0.62	0.29	1.59	0.21	8.01
1970	0.19	0.18	0.13	0.10	0.15	1.25	9.85	10.05	7.36	3.38	1.42	0.60	2.89	0.10	10.05
1971	0.29	0.24	0.22	0.96	0.86	12.46	7.56	7.84	3.78	2.45	1.21	0.51	3.20	0.22	12.46
1972	0.26	0.35	0.42	0.29	0.12	1.35	16.16	6.15	6.64	2.80	1.65	0.81	3.08	0.12	16.16
1973	0.36	0.25	0.57	0.09	0.27	3.27	8.41	9.48	10.62	6.70	1.58	0.64	3.52	0.09	10.62
1974	0.27	0.12	0.12	0.19	0.73	0.39	8.09	13.65	10.52	2.58	1.23	0.84	3.23	0.12	13.65
1975	0.62	0.56	0.20	0.26	0.44	1.16	11.10	10.67	15.73	4.43	1.49	0.88	3.96	0.20	15.73
1976	0.58	0.54	0.15	0.46	0.98	6.43	6.97	9.63	5.81	2.43	1.12	0.60	2.98	0.15	9.63
1977	0.47	0.40	0.12	0.37	0.60	3.81	7.78	5.98	3.34	1.85	1.08	0.92	2.23	0.12	7.78
1978	0.55	0.23	0.24	0.45	0.90	4.08	10.51	13.69	6.74	5.42	1.64	0.81	3.77	0.23	13.69
1979	0.47	0.63	0.21	0.32	0.25	0.61	5.86	8.02	3.31	1.65	0.89	0.83	1.92	0.21	8.02
1980	0.41	0.19	0.23	0.09	0.30	2.81	7.06	7.75	4.12	1.60	0.75	0.41	2.14	0.09	7.75
1981	0.34	0.23	0.19	0.56	0.74	0.66	4.84	6.07	6.67						
Mean	0.42	0.31	0.26	0.32	0.44	2.39	7.60	8.97	6.08	2.81	1.19	0.67	2.62	0.26	8.97
Min.	0.19	0.12	0.12	0.06	0.12	0.23	3.06	5.98	3.02	1.35	0.62	0.29	1.26	0.06	5.98
Max.	0.65	0.63	0.65	0.96	0.98	12.46	16.16	13.69	15.73	6.70	1.65	0.92	5.93	0.63	16.16

Table 4-23 Correlation Factors of Specific Discharges at Selected Stations

Station	St.No.	Catchment Area (C.A.)	Target Station & its C.A.	Nos. of Data	Correlation Factor	Correlation Formula		Priority	Remarks
						a of Y=aX + b	b of Y=aX + b		
Mahankal	No.507	13.7 km2	No.505	108	0.9535	0.8324	-0.2264	X	No need for application
Shyamdado	No.510	3.34 km2	Sundarijal	108	0.8416	0.7551	1.3257	X	No need for application
Gauri Ghat	No.530	67.8 km2	16.5 km2	91	0.9172	1.3304	0.5306	X	No need for application
Budhanilkanta	No.536.2	4.43 km2		200	0.8753	0.7714	1.1854	2	
- do -				197	0.9210	0.8546	0.8973	1	Excluded 3 data
Thika Bhairaw	No.540	42.5 km2		260	0.7411	1.4178	2.7566	4	
Chobhar	No.550	585.0 km2		222	0.8218	1.7688	1.7607	3	
Sundarijal	No.505	16.5 km2	No.536.2	200	0.8753	0.9932	0.3409	2	
Mahankal	No.507	13.7 km2	Budhanilkantha	36	0.9522	1.0104	-1.3851	X	No need for application
Shyamdado	No.510	3.34 km2	4.43 km2	36	0.8265	0.5973	0.8278	X	No need for application
Gauri Ghat	No.530	67.8 km2		43	0.8765	1.3433	0.2747	X	No need for application
Thika Bhairaw	No.540	42.5 km2		190	0.7590	1.6108	2.6704	3	
Chobhar	No.550	585.0 km2		152	0.9301	1.8817	0.9244	1	
Sundarijal	No.505	16.5 km2	No.540	260	0.7411	0.3874	0.1121	4	
Mahankal	No.507	13.7 km2	Thika Bhairaw	108	0.8629	0.3667	-0.2566	X	No need for application
Shyamdado	No.510	3.34 km2	42.5 km2	108	0.7832	0.3420	0.3623	2	
Gauri Ghat	No.530	67.8 km2		91	0.8940	0.6558	-0.1815	X	No need for application
Budhanilkanta	No.536.2	4.43 km2		190	0.7590	0.3576	0.1628	3	
Chobhar	No.550	585.0 km2		220	0.8156	0.8945	0.1784	1	

Table 4-24 (1/5) Recorded and Reconstituted Monthly Specific Discharge (m3/sec/100km2)

Gauging Stn.		Sundarijal	Mahankal	Shyamdado	Gauri Ghat	Budhanilkantha	Thika Bhairaw	Chobhar
C.A.=		16.5 km2	13.7 km2	3.34 km2	67.8 km2	4.43 km2	42.5 km2	585 km2
A.B.R.=		2,930mm	2,940mm	2,450mm	2,340mm	2,720mm	2,390mm	1,900mm
Year	Month	No. 505	No.507	No.510	No. 530	No.536.2	No.540	No.550
1963	Jan.	1.33	1.02	1.86		*1.84*	0.49	0.49
	Feb.	0.79	0.58	1.23		*1.34*	0.13	0.22
	Mar.	0.85	0.80	1.05		*2.15*	0.47	0.65
	Apr.	1.15	0.51	0.87		*1.77*	0.33	0.45
	May	1.09	0.73	0.84		*1.69*	0.31	0.41
	Jun.	2.55	3.07	3.62		*3.13*	0.26	1.17
	Jul.	12.36	24.23	7.22		*9.80*	3.27	4.72
	Aug	29.27	36.64	32.01		*19.71*	9.48	9.98
	Sep.	16.06	17.81	21.23		*12.63*	8.42	6.22
	Oct.	6.67	9.64	5.42		*6.17*	4.87	2.79
	Nov.	3.27	5.62	3.20		*3.42*	0.94	1.33
	Dec.	2.06	4.09	2.28		*2.38*	0.56	0.77
1964	Jan.	1.39	2.48	1.92		*1.78*	0.38	0.46
	Feb.	0.91	1.68	1.32		*1.43*	0.33	0.27
	Mar.	0.67	1.31	1.02		*1.26*	0.26	0.18
	Apr.	0.67	1.46	0.78		*1.48*	0.38	0.30
	May	0.85	1.39	1.11		*1.66*	0.96	0.39
	Jun.	1.74	4.09	1.83		*3.13*	0.89	1.17
	Jul.	10.18	17.66	10.66		*11.38*	5.58	5.56
	Aug	23.35	27.81	22.10		*14.24*	7.79	7.08
	Sep.	22.12	24.82	13.98		*12.05*	10.82	5.91
	Oct.	7.87	10.73	7.84		*4.75*	2.87	2.03
	Nov.	3.76	5.91	5.09		*2.81*	1.55	1.00
	Dec.	2.85	4.09	3.41		*2.05*	1.11	0.60
1965	Jan.	2.18	2.34	1.95	1.37	*1.63*	0.71	0.38
	Feb.	1.72	1.68	1.35	0.77	*1.33*	0.52	0.22
	Mar.	1.42	1.24	1.05	0.52	*1.35*	0.56	0.23
	Apr.	1.43	1.17	0.84	0.58	*1.64*	0.66	0.38
	May	1.32	0.80	0.60	0.31	*1.24*	0.56	0.17
	Jun.	2.54	2.92	4.85	2.71	*3.78*	1.20	1.52
	Jul.	8.83	16.57	11.71	10.53	*12.68*	15.84	6.25
	Aug	19.24	22.77	13.71	17.27	*17.51*	14.42	8.81
	Sep.	8.14	14.67	6.80	4.78	*6.61*	4.40	3.02
	Oct.	4.65	7.52	3.77	2.63	*4.33*	2.02	1.81
	Nov.	3.54	5.40	2.84	2.64	*4.00*	1.18	1.64
	Dec.	2.25	3.87	2.10	1.92	*2.30*	0.45	0.73
1966	Jan.	1.99	2.85	1.80	1.84	*2.14*	0.61	0.65
	Feb.	1.76	1.82	1.44	1.17	*1.66*	0.47	0.39
	Mar.	1.54	1.31	1.02	0.99	*1.23*	0.24	0.16
	Apr.	1.33	1.02	0.78	0.32	*1.03*	0.16	0.06
	May	3.40	2.70	0.72	0.16	*1.34*	0.19	0.22
	Jun.	6.59	4.53	1.29	0.83	*1.85*	0.12	0.49
	Jul.	17.87	18.03	8.26	10.86	*10.49*	1.91	5.08
	Aug	30.96	46.50	28.11	21.84	*22.24*	18.21	11.33
	Sep.	20.92	19.64	19.85	10.40	*8.42*	7.69	3.98
	Oct.	6.33	5.69	8.11	4.16	*3.47*	2.14	1.35
	Nov.	2.79	4.45	4.31	2.09	*2.48*	1.06	0.83
	Dec.	2.14	3.50	1.98	1.18	*2.05*	0.59	0.60
1967	Jan.	1.82	1.75	1.35	0.91	*1.66*	0.33	0.39
	Feb.	1.44	1.31	0.99	0.46	*1.44*	0.14	0.28
	Mar.	1.35	1.24	0.93	0.55	*1.65*	0.35	0.38
	Apr.	1.40	1.31	1.08	0.71	*1.63*	0.52	0.38
	May	1.27	1.02	0.57	0.25	*1.33*	0.19	0.21
	Jun.	2.67	5.55	2.57	1.31	*2.63*	0.40	0.91
	Jul.	21.27	20.44	17.51	16.11	*13.22*	5.69	6.53
	Aug	23.89	18.91	14.91	12.18	*15.73*	9.53	7.87
	Sep.	16.00	15.40	13.47	6.77	*9.74*	4.47	4.68
	Oct.	5.81	6.20	6.53	2.17	*3.56*	1.86	1.40
	Nov.	2.41	3.28	3.80	1.81	*2.56*	0.59	0.87
	Dec.	1.35	3.28	1.71	1.37	*2.02*	0.42	0.58

Note : *Figures shown in Italic were estimated based on the correlation between the other gauging station.*

Table 4-24 (2/5) Recorded and Reconstituted Monthly Specific Discharge (m3/sec/100km2)

Gauging Stn.		Sundarijal	Mahankal	Shyamdado	Gauri Ghat	Budhanilkantha	Thika Bhairaw	Chobhar
C.A.=		16.5 km2	13.7 km2	3.34 km2	67.8 km2	4.43 km2	42.5 km2	585 km2
A.B.R.=		2,930mm	2,940mm	2,450mm	2,340mm	2,720mm	2,390mm	1,900mm
Year	Month	No. 505	No.507	No.510	No. 530	No.536.2	No.540	No.550
1968	Jan.	0.87	2.26	1.50	1.00	*1.79*	0.21	0.46
	Feb.	0.66	1.61	1.14	0.88	*1.60*	0.14	0.36
	Mar.	0.78	2.92	0.75	0.91	*1.32*	0.31	0.21
	Apr.	0.74	1.53	0.75	0.55	*1.17*	0.16	0.13
	May	0.59	1.31	0.60	0.32	*1.36*	0.38	0.23
	Jun.	6.93	14.23	2.81	6.30	*4.04*	3.88	1.65
	Jul.	23.04	27.37	13.47	12.60	*18.03*	7.39	9.09
	Aug	26.94	30.15	23.95	19.45	*16.76*	7.29	8.42
	Sep.	16.91	17.23	7.37	11.98	*6.98*	2.78	3.22
	Oct.	9.18	11.53	8.95	8.22	*9.48*	7.62	4.55
	Nov.	3.20	6.28	3.92	3.88	*3.03*	1.01	1.12
	Dec.	1.68	5.18	2.40	2.27	*2.04*	0.33	0.59
1969	Jan.	1.28	2.92	1.89	0.97	0.61	0.09	0.43
	Feb.	1.27	1.53	1.41	0.47	0.56	0.05	0.25
	Mar.	1.19	1.39	1.23	0.44	0.65	0.07	0.34
	Apr.	1.16	1.09	0.99	0.40	0.52	0.09	0.21
	May	1.23	1.17	0.96	0.44	0.74	0.35	0.35
	Jun.	1.26	2.55	1.29	0.35	0.95	0.07	0.23
	Jul.	6.75	12.63	6.65	3.22	7.00	2.35	3.06
	Aug	15.26	17.23	8.71	8.97	14.90	8.96	8.01
	Sep.	14.00	15.77	7.43	9.44	14.45	6.07	3.92
	Oct.	6.37	6.64	4.25	5.24	6.09	2.07	1.37
	Nov.	2.92	4.67	2.90	3.63	1.90	0.75	0.62
	Dec.	1.88	3.72	2.10	2.51	0.59	0.19	0.29
1970	Jan.	1.36	2.48	2.10	1.65	0.45	0.21	0.19
	Feb.	1.34	1.75	1.62	1.03	0.32	0.21	0.18
	Mar.	1.27	1.39	1.29	0.96	0.32	0.16	0.13
	Apr.	1.21	1.17	1.14	0.75	0.34	0.19	0.10
	May	1.02	1.53	1.38	1.55	0.70	0.14	0.15
	Jun.	2.42	7.01	4.70	2.74	4.74	1.53	1.25
	Jul.	14.90	15.84	21.98	10.68	16.03	10.35	9.85
	Aug	29.63	24.67	33.92	15.97	29.57	11.74	10.05
	Sep.	17.91	15.91	17.75	9.44	24.15	5.34	7.36
	Oct.	8.09	9.78	27.22	5.99	8.13	3.46	3.38
	Nov.	2.27	5.26	24.43	3.92	2.26	1.88	1.42
	Dec.	1.17	3.65	7.43	2.43	0.70	1.15	0.60
1971	Jan.	0.91	2.26	2.31	1.56	0.56	0.71	0.29
	Feb.	0.67	1.75	1.89	0.97	0.45	0.66	0.24
	Mar.	0.49	1.31	1.56	0.88	0.41	0.78	0.22
	Apr.	0.83	2.70	1.89	2.24	1.04	0.66	0.96
	May	0.86	4.16	1.74	2.11	0.90	0.78	0.86
	Jun.	13.58	23.36	35.93	23.47	16.25	15.76	12.46
	Jul.	17.88	24.38	27.78	12.45	20.99	4.54	7.56
	Aug	25.86	27.30	40.72	14.97	24.60	7.76	7.84
	Sep.	14.81	12.63	16.86	5.58	12.19	4.35	3.78
	Oct.	6.02	5.62	7.63	4.50	8.13	2.61	2.45
	Nov.	3.40	4.09	4.85	2.92	2.93	1.93	1.21
	Dec.	1.88	2.77	2.37	1.95	1.94	1.27	0.51
1972	Jan.	1.35			0.96	1.44	0.92	0.26
	Feb.	1.15			0.80	1.72	1.06	0.35
	Mar.	1.13			0.56	1.92	0.99	0.42
	Apr.	0.95			0.40	1.96	0.68	0.29
	May	1.15				1.96	0.45	0.12
	Jun.	2.37			0.34	4.29	0.54	1.35
	Jul.	13.88				19.41	6.16	16.16
	Aug	17.18				15.80	2.49	6.15
	Sep.	17.12				18.51	2.87	6.64
	Oct.	5.23				5.42	1.25	2.80
	Nov.	2.99			1.61	2.71	1.06	1.65
	Dec.	1.87			0.78	2.08	0.85	0.81

Note : *Figures shown in Italic were estimated based on the correlation between the other gauging station.*

Table 4-24 (3/5) Recorded and Reconstituted Monthly Specific Discharge (m3/sec/100km2)

Gauging Stn.		Sundarijal	Mahankal	Shyamdado	Gauri Ghat	Budhanilkantha	Thika Bhairaw	Chobhar
C.A.=		16.5 km2	13.7 km2	3.34 km2	67.8 km2	4.43 km2	42.5 km2	585 km2
A.B.R.=		2,930mm	2,940mm	2,450mm	2,340mm	2,720mm	2,390mm	1,900mm
Year	Month	No. 505	No.507	No.510	No. 530	No.536.2	No.540	No.550
1973	Jan.	1.33				1.63	0.64	0.36
	Feb.	1.15				1.24	0.54	0.25
	Mar.	1.13				1.60	0.59	0.57
	Apr.	0.90				0.97	0.49	0.09
	May	1.14				1.44	0.52	0.27
	Jun.	5.70				9.93	4.87	3.27
	Jul.	13.62				14.00	4.85	8.41
	Aug	*21.15*				23.70	3.34	9.48
	Sep.	*18.65*				20.77	6.80	10.62
	Oct.	*13.05*				14.22	5.55	6.70
	Nov.	4.35				6.09	1.51	1.58
	Dec.	2.06				1.99	0.78	0.64
1974	Jan.	1.52				1.15	0.54	0.27
	Feb.	1.13				0.99	0.35	0.12
	Mar.	0.79				0.86	0.35	0.12
	Apr.	0.45				0.72	0.38	0.19
	May	1.74				0.93	0.40	0.73
	Jun.	1.76				1.63	0.35	0.39
	Jul.	9.79				12.42	1.27	8.09
	Aug	13.60				18.51	10.16	13.65
	Sep.	12.76				19.41	12.52	10.52
	Oct.	5.50				*5.78*	1.06	2.58
	Nov.	3.03				4.06	0.59	1.23
	Dec.	2.13				2.93	0.54	0.84
1975	Jan.	1.75				1.53	0.38	0.62
	Feb.	1.57				1.22	0.26	0.56
	Mar.	1.58				0.84	0.24	0.20
	Apr.	1.12				0.63	0.24	0.26
	May	0.74				1.51	0.28	0.44
	Jun.	1.82				3.39	0.59	1.16
	Jul.	3.76				26.64	7.76	11.10
	Aug	4.18				21.44	13.22	10.67
	Sep.	11.26				30.25	8.59	15.73
	Oct.	7.06				14.22	4.24	4.43
	Nov.	3.63				4.51	1.60	1.49
	Dec.	2.75				0.79	0.99	0.88
1976	Jan.	2.12				1.15	0.59	0.58
	Feb.	1.56				1.15	0.49	0.54
	Mar.	0.89				0.84	0.35	0.15
	Apr.	0.97				1.20	0.28	0.46
	May	2.56				1.87	0.31	0.98
	Jun.	21.75				9.93	1.86	6.43
	Jul.	25.57				17.83	6.66	6.97
	Aug	27.88				23.48	5.53	9.63
	Sep.	25.41				17.16	5.91	5.81
	Oct.	6.13				7.90	2.31	2.43
	Nov.	3.00				2.48	1.08	1.12
	Dec.	2.94				0.59	0.61	0.60
1977	Jan.	2.30				0.99	0.33	0.47
	Feb.	2.03				0.43	0.42	0.40
	Mar.	1.53				0.54	0.33	0.12
	Apr.	2.18				0.93	0.24	0.37
	May	2.61				2.48	0.26	0.60
	Jun.	5.06				3.39	0.80	3.81
	Jul.	16.93				7.00	3.98	7.78
	Aug	17.67				12.19	4.12	5.98
	Sep.	12.23				8.58	2.40	3.34
	Oct.	7.79				4.06	1.32	1.85
	Nov.	5.48				2.71	0.78	1.08
	Dec.	4.50				1.81	0.64	0.92

Note : *Figures shown in Italic were estimated based on the correlation between the other gauging station.*

Table 4-24 (4/5) Recorded and Reconstituted Monthly Specific Discharge (m3/sec/100km2)

Gauging Stn.		Sundarijal	Mahankal	Shyamdado	Gauri Ghat	Budhanilkantha	Thika Bhairaw	Chobhar
C.A.=		16.5 km2	13.7 km2	3.34 km2	67.8 km2	4.43 km2	42.5 km2	585 km2
A.B.R.=		2,930mm	2,940mm	2,450mm	2,340mm	2,720mm	2,390mm	1,900mm
Year	Month	No. 505	No.507	No.510	No. 530	No.536.2	No.540	No.550
1978	Jan.	3.86				1.65	0.59	0.55
	Feb.	3.03				1.67	0.38	0.23
	Mar.	3.30				1.69	0.71	0.24
	Apr.	3.09				1.15	0.54	0.45
	May	4.52				4.29	0.49	0.90
	Jun.	6.19				10.38	2.87	4.08
	Jul.	13.87				20.09	8.89	10.51
	Aug	30.21				22.35	13.55	13.69
	Sep.	18.75				12.87	12.28	6.74
	Oct.	10.31				9.71	3.08	5.42
	Nov.	4.10				3.61	1.08	1.64
	Dec.	2.25				2.05	0.49	0.81
1979	Jan.	1.44				1.13	0.33	0.47
	Feb.	0.78				1.04	0.26	0.63
	Mar.	0.52				0.72	0.33	0.21
	Apr.	0.73				0.72	0.21	0.32
	May	0.95				1.04	0.12	0.25
	Jun.	1.82				4.29	0.09	0.61
	Jul.	11.02				12.87	21.08	5.86
	Aug	13.67				14.22	14.78	8.02
	Sep.	12.25				8.13	1.34	3.31
	Oct.	5.96				3.61	0.21	1.65
	Nov.	3.62				1.31	0.19	0.89
	Dec.	3.09				0.90	0.19	0.83
1980	Jan.	1.92				0.56	0.16	0.41
	Feb.	1.30				0.54	0.14	0.19
	Mar.	0.80				0.50	0.14	0.23
	Apr.	0.97				0.07	0.12	0.09
	May	1.56				0.88	0.09	0.30
	Jun.	8.86				3.39	6.78	2.81
	Jul.	17.61				14.67	8.78	7.06
	Aug	15.53				16.70	4.35	7.75
	Sep.	13.90				9.71	1.91	4.12
	Oct.	7.48				3.84	1.11	1.60
	Nov.	4.48				1.31	0.42	0.75
	Dec.	3.17				1.06	0.31	0.41
1981	Jan.	2.02				0.74	*0.48*	0.34
	Feb.	1.57				0.34	*0.38*	0.23
	Mar.	1.57				0.23	*0.35*	0.19
	Apr.	1.66				0.52	*0.68*	0.56
	May	2.36				1.44	0.18	0.74
	Jun.	4.36				4.29	0.16	0.66
	Jul.	13.21				10.61	1.15	4.84
	Aug	16.81				19.86	0.99	6.07
	Sep.	12.97				17.16	*6.14*	6.67
	Oct.	6.46				6.32	*2.42*	
	Nov.	3.89				3.39	*1.37*	
	Dec.	2.65				1.74	*0.78*	
1982	Jan.	1.94				1.53	*0.71*	
	Feb.	2.18				1.63	*0.74*	
	Mar.	1.71				0.97	0.31	
	Apr.	2.48				2.08	0.26	
	May	1.58				0.88	*0.48*	
	Jun.	2.27				4.97	*1.94*	
	Jul.	7.30				15.12	0.96	
	Aug	13.45				23.25	2.31	
	Sep.	13.66				15.80	4.75	
	Oct.	5.35				9.03	1.67	
	Nov.	2.30				5.19	1.36	
	Dec.	2.12				2.93	1.06	

Note : *Figures shown in Italic were estimated based on the correlation between the other gauging station.*

Table 4-24 (5/5) Recorded and Reconstituted Monthly Specific Discharge (m3/sec/100km2)

Gauging Stn.		Sundarijal	Mahankal	Shyamdado	Gauri Ghat	Budhanilkantha	Thika Bhairaw	Chobhar
C.A.=		16.5 km2	13.7 km2	3.34 km2	67.8 km2	4.43 km2	42.5 km2	585 km2
A.B.R.=		2,930mm	2,940mm	2,450mm	2,340mm	2,720mm	2,390mm	1,900mm
Year	Month	No. 505	No.507	No.510	No. 530	No.536.2	No.540	No.550
1983	Jan.	1.44				1.78	0.96	
	Feb.	1.15				1.17	0.99	
	Mar.	1.01				1.29	0.73	
	Apr.	1.27				1.15	0.56	
	May	1.36				0.90	0.66	
	Jun.	1.73				3.16	2.45	
	Jul.	16.79				17.38	11.13	
	Aug	22.93				23.02	11.34	
	Sep.	22.79				26.41	8.16	
	Oct.	13.61				16.70	3.79	
	Nov.	6.39				10.16	2.82	
	Dec.	4.35				3.16	1.79	
1984	Jan.	3.47				1.74	1.76	
	Feb.	2.60				0.79	1.69	
	Mar.	2.42				0.68	1.69	
	Apr.	2.40				0.61	1.53	
	May	3.60				1.47	1.34	
	Jun.	6.65				11.06	1.11	
	Jul.	19.75				25.96	4.80	
	Aug	20.25				25.73	5.58	
	Sep.	19.03				24.38	16.52	
	Oct.	6.36				11.96	3.11	
	Nov.	3.33				4.06	0.64	
	Dec.	2.44				2.08	0.40	
1985	Jan.	2.42				1.13	0.38	
	Feb.	1.52				0.79	0.26	
	Mar.	1.25				0.65	0.18	
	Apr.	1.30				0.68	0.12	
	May	2.07				1.33	0.23	
	Jun.	3.39				1.08	0.38	
	Jul.	12.79				14.90	5.41	
	Aug	17.14				21.67	4.38	
	Sep.	18.06				25.73	11.32	
	Oct.	8.67				12.87	9.29	
	Nov.	4.45				8.13	3.32	
	Dec.	2.89				3.84	*1.54*	
1986	Jan.	1.98						
	Feb.	1.50						
	Mar.	1.09						
	Apr.	1.15						
	May	1.31						
	Jun.	3.31						
	Jul.	13.54						
	Aug	17.27						
	Sep.	16.57						
	Oct.	8.29						
	Nov.	4.31						
	Dec.	3.01						

Note : *Figures shown in Italic were estimated based on the correlation between the other gauging station.*

Table 4-25 (1/11) Estimated Monthly Natural Runoff for Selected Schemes (1/11)

Scheme : AK-04 Biswambhara C.A.= 5.84 km2 A.B.R.= 2,210 mm Unit : m3/sec

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	0.059	0.035	0.037	0.051	0.048	0.112	0.545	1.289	0.707	0.294	0.144	0.091	0.284	0.035	1.289
1964	0.061	0.040	0.029	0.029	0.037	0.077	0.449	1.029	0.974	0.347	0.166	0.126	0.280	0.029	1.029
1965	0.096	0.076	0.063	0.063	0.058	0.112	0.389	0.847	0.358	0.205	0.156	0.099	0.210	0.058	0.847
1966	0.088	0.077	0.068	0.059	0.150	0.290	0.787	1.364	0.922	0.279	0.123	0.094	0.358	0.059	1.364
1967	0.080	0.063	0.059	0.062	0.056	0.117	0.937	1.052	0.705	0.256	0.106	0.060	0.296	0.056	1.052
1968	0.038	0.029	0.035	0.033	0.026	0.305	1.015	1.187	0.745	0.404	0.141	0.074	0.336	0.026	1.187
1969	0.056	0.056	0.052	0.051	0.054	0.056	0.297	0.672	0.617	0.281	0.128	0.083	0.200	0.051	0.672
1970	0.060	0.059	0.056	0.053	0.045	0.107	0.656	1.305	0.789	0.356	0.100	0.052	0.303	0.045	1.305
1971	0.040	0.030	0.021	0.037	0.038	0.598	0.788	1.139	0.652	0.265	0.150	0.083	0.320	0.021	1.139
1972	0.060	0.051	0.050	0.042	0.051	0.104	0.611	0.757	0.754	0.230	0.132	0.082	0.244	0.042	0.757
1973	0.059	0.051	0.050	0.040	0.050	0.251	0.600	0.932	0.821	0.575	0.191	0.091	0.309	0.040	0.932
1974	0.067	0.050	0.035	0.020	0.077	0.078	0.431	0.599	0.562	0.242	0.133	0.094	0.199	0.020	0.599
1975	0.077	0.069	0.069	0.049	0.032	0.080	0.165	0.184	0.496	0.311	0.160	0.121	0.151	0.032	0.496
1976	0.093	0.069	0.039	0.043	0.113	0.958	1.126	1.228	1.119	0.270	0.132	0.130	0.443	0.039	1.228
1977	0.101	0.089	0.068	0.096	0.115	0.223	0.746	0.778	0.539	0.343	0.241	0.198	0.295	0.068	0.778
1978	0.170	0.133	0.145	0.136	0.199	0.273	0.611	1.331	0.826	0.454	0.180	0.099	0.380	0.099	1.331
1979	0.063	0.034	0.023	0.032	0.042	0.080	0.485	0.602	0.539	0.263	0.160	0.136	0.205	0.023	0.602
1980	0.085	0.057	0.035	0.043	0.069	0.390	0.775	0.684	0.612	0.329	0.197	0.139	0.285	0.035	0.775
1981	0.089	0.069	0.069	0.073	0.104	0.192	0.582	0.741	0.571	0.285	0.171	0.117	0.255	0.069	0.741
1982	0.086	0.096	0.076	0.109	0.070	0.100	0.322	0.592	0.602	0.236	0.101	0.093	0.207	0.070	0.602
1983	0.063	0.051	0.044	0.056	0.060	0.076	0.739	1.010	1.004	0.599	0.282	0.191	0.348	0.044	1.010
1984	0.153	0.115	0.107	0.106	0.159	0.293	0.870	0.892	0.838	0.280	0.147	0.108	0.339	0.106	0.892
1985	0.107	0.067	0.055	0.057	0.091	0.150	0.563	0.755	0.796	0.382	0.196	0.127	0.279	0.055	0.796
1986	0.087	0.066	0.048	0.051	0.058	0.146	0.596	0.761	0.730	0.365	0.190	0.133	0.269	0.048	0.761
Mean	0.081	0.064	0.056	0.058	0.075	0.215	0.629	0.905	0.720	0.327	0.159	0.109	0.283	0.056	0.905
Min.	0.038	0.029	0.021	0.020	0.026	0.056	0.165	0.184	0.358	0.205	0.100	0.052	0.105	0.020	0.358
Max.	0.170	0.133	0.145	0.136	0.199	0.958	1.126	1.364	1.119	0.599	0.282	0.198	0.536	0.133	1.364

Scheme : AK-05 Boshan C.A.= 6.8 km2 A.B.R.= 2,250 mm Unit : m3/sec

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sep.	Oct.	Nov.	Dec.	Annual	Min.	Max.
1963	0.109	0.080	0.083	0.099	0.096	0.172	0.685	1.568	0.878	0.387	0.210	0.147	0.376	0.080	1.568
1964	0.112	0.086	0.074	0.074	0.083	0.130	0.571	1.259	1.194	0.450	0.235	0.188	0.371	0.074	1.259
1965	0.153	0.129	0.113	0.114	0.108	0.171	0.500	1.044	0.464	0.282	0.224	0.156	0.288	0.108	1.044
1966	0.143	0.131	0.119	0.109	0.216	0.383	0.972	1.655	1.131	0.370	0.185	0.151	0.464	0.109	1.655
1967	0.134	0.114	0.109	0.112	0.105	0.178	1.150	1.287	0.874	0.343	0.165	0.110	0.390	0.105	1.287
1968	0.085	0.073	0.080	0.078	0.070	0.401	1.242	1.446	0.922	0.518	0.206	0.127	0.437	0.070	1.446
1969	0.106	0.105	0.101	0.099	0.103	0.105	0.392	0.836	0.770	0.372	0.191	0.137	0.276	0.099	0.836
1970	0.110	0.109	0.105	0.102	0.092	0.165	0.817	1.586	0.974	0.461	0.158	0.100	0.398	0.092	1.586
1971	0.086	0.074	0.064	0.083	0.084	0.748	0.973	1.390	0.812	0.353	0.216	0.137	0.418	0.064	1.390
1972	0.110	0.099	0.098	0.089	0.099	0.163	0.764	0.936	0.933	0.312	0.195	0.137	0.328	0.089	0.936
1973	0.109	0.099	0.098	0.086	0.099	0.337	0.750	1.144	1.013	0.721	0.266	0.147	0.405	0.086	1.144
1974	0.118	0.098	0.080	0.062	0.130	0.131	0.550	0.749	0.705	*0.326*	0.197	0.150	0.275	0.062	0.749
1975	0.131	0.121	0.121	0.097	0.077	0.134	0.235	0.257	0.627	0.408	0.229	0.183	0.218	0.077	0.627
1976	0.150	0.121	0.086	0.090	0.173	1.175	1.374	1.495	1.366	0.359	0.196	0.193	0.565	0.086	1.495
1977	0.159	0.145	0.119	0.153	0.175	0.303	0.923	0.961	0.678	0.446	0.325	0.274	0.389	0.119	0.961
1978	0.241	0.197	0.211	0.200	0.275	0.362	0.763	1.617	1.018	0.578	0.253	0.156	0.489	0.156	1.617
1979	0.114	0.080	0.066	0.077	0.089	0.134	0.614	0.753	0.678	0.350	0.228	0.200	0.282	0.066	0.753
1980	0.139	0.107	0.081	0.090	0.121	0.502	0.958	0.850	0.765	0.429	0.273	0.204	0.377	0.081	0.958
1981	0.144	0.121	0.121	0.126	0.162	0.267	0.729	0.917	0.716	0.376	0.242	0.178	0.342	0.121	0.917
1982	0.140	0.153	0.129	0.169	0.121	0.157	0.420	0.741	0.753	0.319	0.159	0.150	0.284	0.121	0.753
1983	0.114	0.099	0.092	0.105	0.110	0.129	0.916	1.237	1.229	0.750	0.373	0.266	0.452	0.092	1.237
1984	0.220	0.175	0.166	0.165	0.227	0.386	1.070	1.097	1.033	0.371	0.213	0.167	0.441	0.165	1.097
1985	0.166	0.118	0.104	0.107	0.147	0.216	0.707	0.934	0.982	0.492	0.271	0.190	0.369	0.104	0.982
1986	0.142	0.117	0.096	0.099	0.107	0.212	0.746	0.941	0.904	0.472	0.264	0.196	0.358	0.096	0.941
Mean	0.135	0.115	0.105	0.108	0.128	0.294	0.784	1.112	0.892	0.427	0.228	0.168	0.375	0.105	1.112
Min.	0.085	0.073	0.064	0.062	0.070	0.105	0.235	0.257	0.464	0.282	0.158	0.100	0.163	0.062	0.464
Max.	0.241	0.197	0.211	0.200	0.275	1.175	1.374	1.655	1.366	0.750	0.373	0.274	0.674	0.197	1.655

Note : Added 0.039 m3/sec from spring for monthly runoff of Boshan estimated based on specific runoff.