

Climate of Langtang Valley

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1. Referred meteorological stations

Langtang Valley was subjected to climatic studies using temporal data obtained by meteorological observations conducted from May, 1968 to September, 1969 at Kyangjin Station and long-term records kept at Timure Station (His Majesty's Government of Nepal, 1968, 71, 72 and 73), both being meteorological observatories of Department of Irrigation, Hydrology and Meteorology, of Nepal Government. Kyangjin (28°13'N, 85°35'E, 3817 m a.s.l.) is the same as Kyangchen, which is spelled by Western scientists. Its altitude decided by our expedition is 3900 m a.s.l. Meanwhile, Timure Station (28°17'N, 85°23'E, 1676 m a.s.l.) is the nearest meteorological station to the valley; and is located on the east side of the Trisuli River near the border between Nepal and China, 23 km west of Yala Glacier in the valley.

2. Air temperature

Monthly averages of air temperature and precipitation of 13 years from 1958 to 1970 were calculated from data (lacking in temperature data in 1965) at Timure Station, as seen in Table 1. Monthly mean air temperatures at Timure and Kyangjin are shown together in Fig. 1. Because the mean lapse rate of air temperature between the two stations was 0.60°C/100 m during the period of simultaneous observations, the plots of Timure Station become comparable with those of Kyangjin Station, if the vertical axis of the former is shifted to the negative direction by a difference of 12.8°C calculated on the basis of the difference in altitude, 2141 m between the two stations.

It follows from Fig. 1 that the monthly mean air temperature at Kyangjin, that is, Langtang Valley, can be estimated fairly well from the data at Timure by using the above lapse

Table 1. Monthly mean temperature (°C) and monthly total precipitation (mm) at Timure (28°17'N, 85°23'E, 1676 m a.s.l.) in averages of the data from 1958 to 1970.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
Air temperature	9.1	11.0	14.7	18.9	21.0	22.4	21.9	21.7	20.8
Precipitation	27.8	26.8	52.1	31.3	29.2	120.6	261.7	267.5	137.5
Percentage (%)	2.8	2.7	5.2	3.1	2.9	12.0	25.9	26.5	13.6
	Oct.	Nov.	Dec.	Annual					
Air temperature	17.3	13.0	10.3	16.8					
Precipitation	45.0	4.4	5.1	1009					
Percentage (%)	4.5	0.4	0.5	100					

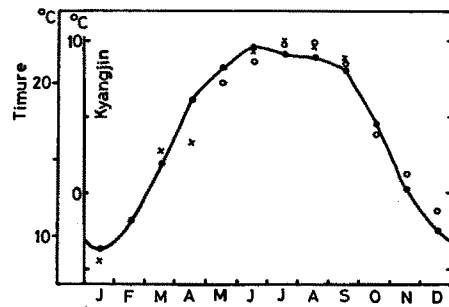


Fig. 1. Monthly mean air temperatures at Timure (1676 m a.s.l.) and Kyangjin (3817 m a.s.l.). The vertical axis of Timure is shifted to the negative direction by a difference of 12.8°C assuming that the lapse rate between both stations is $0.6^{\circ}\text{C}/100\text{ m}$. Solid circle: Timure, averages from 1958 to 1970; Open circle: Kyangjin, 1968; Cross: Kyangjin, 1969.

rate. Then, the altitude at which the mean air temperature is around 0°C in summer (June to August) is estimated by this means to be 5400 m a.s.l., which coincides with the altitude of the boring site in 1982 (5405 m a.s.l.) on Yala Glacier.

3. Precipitation

A comparison of the monthly precipitation at Kyangjin with that at Timure during the period of simultaneous observations discloses that the annual variation has the similar trend in both the stations, though the precipitation was slightly smaller at Kyangjin than that at Timure. Since the precipitation varies markedly with the year and location, as is well known, however, it is assumed that the mean monthly precipitation calculated from data at Timure from 1958 to 1970 is usable as that at Kyangjin to first approximation.

The annual variation in monthly precipitation at Timure is shown in Fig. 2. Generally in Nepal, some 80% of the annual precipitation occurs during the monsoon season from June to September. As for Timure, 78% of that concentrates in the same season, the ratio of monthly precipitations from June to September being 1:2:2:1.

The monsoon precipitation is important for the mass balance of glaciers in the Nepal Himalaya. It is at least supposed that the trend in percentages of mean monthly precipitations of individual months against the annual total at Langtang Valley is similar to that at Timure. However, a more precipitation is expected on the glaciers in Langtang Valley because of an orographic effect.

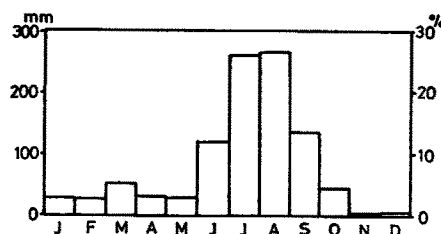


Fig. 2. Mean monthly precipitation and percentages to annual precipitation at Timure from 1958 to 1970.

References

His Majesty's Government of Nepal (1968, 71, 72 and 73): Climatological Records of Nepal, 1966, 1967–68, 1969 and 1970. (separate 4 volumes) Department of Irrigation, Hydrology and Meteorology, Ministry of Food, Agriculture and Irrigation, Kathmandu.