Flight Observations for the Inventory of Glaciers in the Nepal Himalayas*

K. Higuchi**, T. Iozawa** and H. Higuchi***

Abstract

Air flights for photographing glaciers in Nepal Himalayas were carried out eight times during the period from 1970 to 1975. The oblique aerial photographs of glaciers in the Khumbu region taken by these flights will aid to be compared with the glacier inventory by Müller (1970) and the maps hitherto published, as a first step in the inventory study of glaciers in this region.

1. Introduction

Flight observations of glaciers are quite important in the inventory compilation of glaciers in the Nepal Himalayas, since there are many high mountains. However, it is not easy to take vertical photographs of glaciers, because of the difficulty of chartering an aircraft from which aerial photographs can be taken vertically from an altitude higher than the mountain ranges. Projects to take aerial photographs of the land

surface is being planned in Nepal by His Majesty's Government of Nepal and the United Nations Developing Project for mapping and land use. Therefore, it will be possible in the future to take vertical photographs of glaciers as a part of these projects.

At the present stage, it is useful for the inventory of glaciers in the Nepal Himalayas to take oblique photographs from aircraft at an altitude of not much higher than the summit of the mountains, since the oblique photographs

Table 1. List of flights for photographing glaciers in the Nepal Himalayas (1970-1975)

Flight No.	Date	Type of aircraft	Flight altitude	Photographs	Members
1	6 Oct. 1970	Hawker Siddeley 748	6000-7000 m		Iozawa and Sawada
2	21 Nov. 1970	Pilatus Turbo Porter	"	360 photos in colour 400 photos in black and white	Iozawa and Kanou
3	1 Jan. 1972	Hawker Siddeley 748	"	370 photos in colour 2000 photos in black and white	Iozawa and AMKAS Group
4	5 Jan. 1972	De Havilland Twin Otter	"		Ohmori and Iozawa
5	6 Jan. 1972	"	"		"
6	21 Dec. 1974	Pilatus Turbo Porter	"		Ohmori, Inoue and Iozawa
7	23 Dec. 1974	Boeing 727	9900 m	800 photos in colour 2000 photos in black and white	Higuchi, Iozawa and GEN members
8	30 Nov. 1975	Pilatus Turbo Porter	8000 m	300 photos in colour 400 photos in black and white	Watanabe, Fushimi, Ikegami et. al.

* *Glaciological Expedition to Nepal, Contribution No. 5*

** *Water Research Institute, Nagoya University, Nagoya 464*

*** *Faculty of Technology, Ehime University, Matsuyama 790*

1974 b

21 Dec., Boeing 727, GEN. '74
Dr. K. Higuchi and members

Fig. 1. (continued)

can give much informations over a wider area than vertical photographs. Therefore, flight observations of glaciers were carried out in the Nepal Himalayas by taking oblique photographs.

2. Flight observations of glaciers

During the period from 1970 to 1975, flights for photographing glaciers in the Nepal Himalayas were carried out eight times as summarized in Table 1. The flights in 1970 and 1972 were carried out mainly under guidance of Iozawa (1971). The flights in 1974 and 1975 were carried out as a part of the Glaciological Expedition to Nepal. The flight courses except for flight No. 8 are shown in Fig. 1. The area photographed by these flights is shown in Fig. 2.

3. Inventory of glaciers in the Khumbu Region

As seen in Fig. 1, many photographs of glaciers in the Khumbu region were taken by the flights

Fig. 1. Flight courses for photographing glaciers in the Nepal Himalayas (1970-1974).

Fig. 2. Photographed area in Nepal Himalayas for inventory of glaciers.

Fig. 3. Oblique photograph of the Mt. Everest region.

Table 2. Maps used for the inventory of glaciers in the Khumbu region

-
1. Schneider (1957): Mahalangur Himal (1:25,000) contour interval 20 m.
 2. Schneider (1965): Khumbu Himal (1:50,000) contour interval 40 m.
 3. Royal Geographical Society (1961): The Mount Everest Region (1:100,000) contour interval 100 m.
 4. Research Scheme Nepal Himalaya (1968): Rolwaling Himal (Gaurisankar) NEPAL (1:50,000) contour interval 40 m.
 5. Research Scheme Nepal Himalaya (1974): Shorong/Hinku (1:50,000) contour interval 40 m.
-

in 1974 and 1975. Especially, since the flight on 23 December, 1974 was made by a Boeing 727 jet aircraft, the oblique photographs in this case covered a wider area from a higher altitude than the flights by other aircraft. An example is shown in Fig. 3.

Also, as seen in the pilot work by Müller (1970), the source materials for glacier inventory are rich in the Khumbu region than that of other region in Nepal Himalayas.

Therefore, the aerial photographs of the glaciers in the Khumbu region taken by these flights will be compared with the inventory by Müller and the maps in **Table 2**, as the first step in the inventory of glacier in this region. The results will be published in the future.

References

- Müller, F., (1970): Inventory of glaciers in the Mount Everest region. "Perennial ice and snow masses", Technical papers in Hydrology 1, UNESCO/IASH, 47-59.
- Iozawa, T., (1971): Nepal Himalayas no Hyôga Yosatsu (Preliminary study of glaciated land form in the Nepal Himalayas). Geographical Review of Japan, **44**, 405-406.