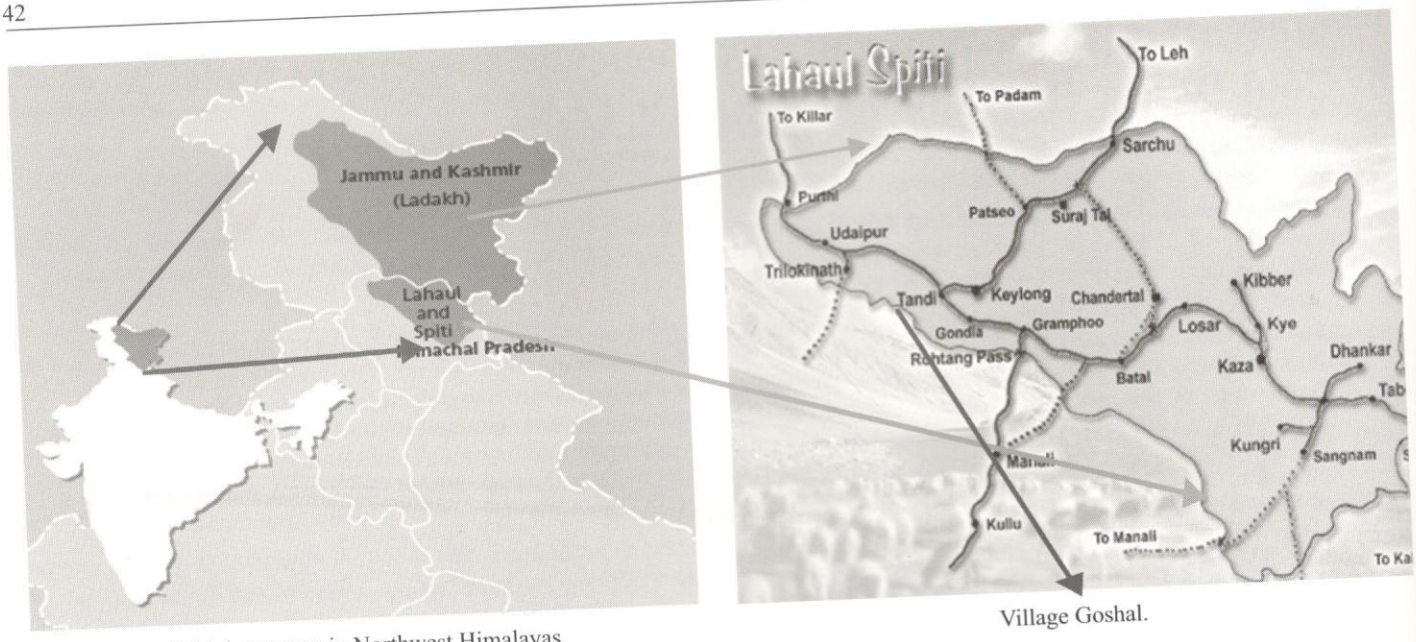

Cold desert area in Northwest Himalayas. Village Goshal.

Fig.1. Location of study site.

Goshal village is located on a fan shaped alluvial deposits and occupies 28.90 ha of land. Above the agricultural fields, the area supports grazing lands. As the grazing land rise up, we find the invasion of shrubs. On higher reaches, the area supports conifer forest and above that the glacial level exists from where the melt flow down through gorges and feeds the entire village. The village is well known for its productive fields and farmers prefer to grow Peas, Potato, Vegetables (Cabbage), Apple, Barley and Medicinal Plants.

Ecosystem Classification

The residents of village Goshal follow agropastoral livelihood and with the age old experience had developed their own landuse pattern depending upon availability and quality of land, availability of water for irrigation plus their requirements for growing of crops, grazing areas for their husbandry and forest areas for other uses (Fig.2). The entire village area as per Revenue records and the adjoining alpine pastures and forest areas under the usage of village residents was differentiated as per the khasra number for: Forest Ecosystem: Alpine Ecosystem and Agro-ecosystem.

Site Selection

Each ecosystem (Forest Ecosystem, Alpine Pasture Ecosystem and Agro-ecosystem) was divided into nine different grids for sampling (Fig 3). Sampling in each grid was carried out following quadrate method. Size of quadrate for forest ecosystem, alpine pasture ecosystem and agroecosystem was estimated following Species Area Curve as proposed by Oosting (1958). On the basis of Species Area Curve, the quadrate size for forest ecosystem came out to be 50×50 m for trees and shrubs; in alpine pasture ecosystem the quadrate size for shrubs was 25×25 m, while for grasses and herbs it was 1×1 m; however in agroecosystem the quadrate size for crops was 1×1 m and for grasses and herbaceous flora it was also 1×1 m. Three quadrates were laid in each grid in all the three ecosystems for recording photosynthetic data.

Photosynthetic Activities

The photosynthetic activity of different plants was estimated with the help of Portable Photosynthetic System (Model CID, Inc, C1-301PS). Other related parameters like photosynthetically active radiation, transpiration rate, and carbondioxide intake by plants, carbondioxide released by the plant, leaf temperature, relative humidity and stomatal conductance were also noted.

Water Use Efficiency

The water use efficiency of different species was estimated by dividing the rate of photosynthetic activity by transpiration rate of the plant.

RESULTS AND DISCUSSIONS

Photosynthetic Activities: Photosynthetic efficiency of various crops and natural vegetation found growing in study site was estimated and data pooled under different weather conditions such as clear sky or cloudy sky and at different time periods of the day to arrive at pooled values overall rate and the same is presented species and crop wise. Regarding the photosynthetic activity and other related parameters, it can be said that leaving aside the higher altitudes, even though there is one growing season, there is hardly any limiting factor during the active growth period in these regions, excepting the high altitudinal