CHAPTER 1

INTRODUCTION

Nepalese farmers generally practice mixed farming. Crops and animal production are two major agricultural enterprises. Agricultural system to a large extent is small farm based and subsistence in nature.

In an actual farming system, animals and food crops rely on each other to grow well under common rural circumstances. Since the main economic motivation of farmers is targeted through food crops, animals become an important commodities in supplying manure and draft power (Ismail *et al.*, 1988).

Several problems have been reported in the integrated crop-livestock farming systems of Nepal. Upreti *et al.*, (1988) reported that, under hills and mid hills rainfed conditions, rice and maize are well established crops but with low productivity per year. Apart from this, a typical farm is generally small with less than 0.5 ha size in Nepal (Carangal *et al.*, 1988). With the very low per capita income as well as ever rising price, farmers are unable to use sufficient amount of inorganic source of fertilizers. Intensive utilization of land with less attention in the fertility management of soil has caused severe affect to the productivity of soil.

On the other hand, livestock are generally stall-fed because of lack of pasture and forest land areas. Livestock production problems are found; lack of fodder trees, inadequate pasture, no forest land to graze, animal disease etc. Normally there is shortage of livestock feed for 9 months from February to July and from September to November (Upreti *et al.*, 1988, Devkota *et al.*, 1991). Limited feed resources during the dry season tends to limit animal production (Carangal *et al.*, 1988).

In Nepal, farmers generally do not grow forage crops for livestock. Their priority is food crops. However, there is a potential to integrate forage crop in the existing cropping systems without reducing the areas for food crops. Cereal legume intercropping may produce more food crops. Like wise, by using legume as a fodder, good quality forage legumes can be harvested and stall-fed to the animals as a high-protein supplement to grasses. Which can also used as a preserved fodder to feed during a shortage of supply in the dry period. Along with these, organic fertilizer for the next crop can be added through maximizing resource use in intercropping system, which may not only improve the soil fertility, but also could increased the crop productivity. In this circumstances, there is a possibility of intercropping maize with lablab as a forage legume.

Growing two or more crops together or more particularly, intercropping as a method of crop intensification is commonly practiced by the traditional farmers (Herrara *et al.*, 1975). In Nepal, intercropping often involves a cereal and a legume

with the cereal being considered as the main crop. Cereal in most cases is the main food source and is most adapted into the agricultural systems.

Combinations of crops are determined by various factors, but usually early and late maturing crops are combined to ensure efficient utilization of the entire growing season (Ofori and Stern, 1987). legume component is capable of fixing atmospheric nitrogen under favorable conditions in cereal legume intercropping, and this is thought to reduce competition for nitrogen with cereal component (Trenbath, 1976).

Maize is well established cereal crop meant to human food. It is widely grown under rainfed as well as irrigated conditions of terai and hills of Nepal (Timsina, 1986). Maize can be successfully intercropped with legumes. There are some evidences in which maize yield was not affected in intercropping. In a maize-cowpea intercropping maize yield was not affected, rather intercepted greater amounts of solar radiation and developed a more extensive root system (Bray, 1954, adapted from Wahua, 1983). Francis *et al.*, 1982 b, adapted from Ofori and Stern, 1987) found that maize yield was less affected when simultaneous sowing and not affected when 10 days earlier sowing of maize in a maize beans intercropping.

Lablab bean (*Lablab purpureus* **(L.) Sweet)** is a short lived perennial legume in the tropics. Fribourg *et al.*, (1984) has discussed about the potentialities of lablab. According to the authors, lablab is widely cultivated in parts of Africa, the caribbean,

the Indian Sub-continent and other regions in Asia and Australia. Its forage potential has been recognized in Brazil, Australia and elsewhere. It has a very leafy herbage. It is indeterminate in flowering habit.

Lablab tend to grow and spread very quickly forming a quick coverage of biomass. Auxiliary buds on lower stems are very active in lablab. This tendency favor for the regrowth and cutting management practices (Fribourg *et al.*, 1984). It has very early vigor and fast growth rate overcrowding the associated crop in the intercropping. Therefore, competition with the associated crop for light and minimization of shading effect can be done through better cutting management practices.

This study was conducted to determine the productivity of maize/ lablab intercropping system, in terms of grain yield and yield components of maize, biomass and fodder yield of lablab as well as input from nitrogen fixation.