Introduction

Cattle play pivotal role in animal husbandry sector of India with the population of 185 millions heads which includes 160 million indigenous cattle population (Livestock and Poultry Census, 2003) distributed throughout the country and providing livelihood sustenance to millions of rural habitats. Indigenous cattle wealth, which contribute about 87 per cent of total cattle population is endowed with 30 recognized breeds of cattle spread over various states across the length and breadth of the country. Each breed has its own characteristic features, whether specific for milk production, draught power or both, having evolved over generations by natural selection and needs of the people to fulfill their specific local demands. Thus, these breeds become well adapted with local agro climatic conditions and merged deeply in social, cultural and economical facets of human society. Among cattle breeds, Hariana is one of the most important dual purpose breed originally developed and reared in the northwest part of India (Joshi et al., 1995). The bullocks are good for agricultural operations and the milk yield of Hariana cattle ranges from 809 to 1731 kg (Mishra et al., 1980; Upadhay and Madan, 1985). Owing to these attributes, the breed has extensively been used for grading up the non-descript cattle particularly to improve their draft ability in Indo-Gangetic plains. Tantia et al. (1994) reported about 8.6% decline in population of Hariana cattle during the period 1977-82. The decrease in the population of indigenous cattle in Hariana state, the central breeding tract of Hariana cattle, during the period 1997-2003 was further reduced to 37.73% (Livestock and Poultry Census, 2003). Many programmes have been initiated from time to time to improve its productivity in the past by various government and non-government organizations. However, in spite of all these efforts and usefulness of the breed, it has declined to the extent of its survival rather it
is in danger of extinction (Joshi et al., 1996; Kumar and Dixit, 2006).

The native breeding tract of Hariana cattle lies between 28°30' and 30° north latitude and 75° 45' and 76° 80' east longitude. The native breeding tract of Hariana cattle encompasses large part of Rohtak, Hisar and Gurgaon districts of Hariana cattle. Purebred Hariana cattle were abundant in Jhajjar, Beri and Jahajgarh pockets of Rohtak district and the region was a leading trading centre particularly for Hariana bullocks. Besides the distribution of Hariana cattle in its traditional breeding tract and other adjoining areas, these animals were reared in the erstwhile princely States of Nabha, Patiala, Jaipur, Jodhpur, Alwar, Loharu and Bharatpur. Meerut, Bulandshahar and Aligarh districts of Western Uttar Pradesh also had sizable population of this breed. Till recent time the Hariana bullocks were considered a prized possession due to their outstanding draft ability. The milking qualities of cows received belated attention. This breed has also proven over the years as good milk yielder. However, changes in agricultural scenario have made the Hariana cattle like many other indigenous cattle breeds uneconomical.

Hariana breed was evolved by combining several native breeds. Khan (1947) reported 18 Indian cattle breeds at Hisar Livestock Farm in 1876 and speculated their contribution in evolving Hisar cattle breed which led to replacement of local Hariana herd. It was noticed that farmers of certain areas of Punjab had special liking for white and others for the dark grey colour of the cattle. The herd was, therefore, divided on these lines and this made the breed more popular in the region.

Hitherto censuses of livestock have been conducted species wise without identification of the breed. Owing to this lacuna, the geographical distribution and population structure of livestock breeds remains a matter of conjectures. However, it was
revealed in a survey report by Panse et al. (1964) that in rural areas of Punjab and Haryana, the cattle population comprised of 52% Hariana cattle, 46% non-descript cattle and 2% of Sahiwal, Red Sindhi etc. In urban area, Hariana breed accounted for about 39% while 56% were non-descript and 5% other breeds like Red Sindhi and Sahiwal. The qualitative and quantitative traits as well as production performance on farmer’s herds are not known. Only three decades ago, average agricultural land holding was between 8-10 hectares in the Hariana breed tract and each household reared about 6-8 cattle primarily for bullock production. These draft animals were pivotal for carrying out agriculture operations. In early fifties, Hariana cattle population was reported to be approximately 12 lakhs in its native home tract (Joshi and Phillips, 1953). The large cattle herds mainly grazed on the common pasture lands of the village. However, as the pasture land progressively shrunk, the traditional and perhaps the cheapest mode of rearing large cattle population received a grave set back. The diversion of grazing lands into intensive agriculture and changes in the cropping pattern are meteoric in this region. These changes obviously heralded green revolution in this area but affected traditional livestock husbandry.

The Hariana cattle declined as crossbred cattle and buffaloes gradually replaced them from their bastion. The quinquennial livestock censuses (1972, 1977, 1982 and 1988) have revealed a declining trend in cattle population in Haryana state (Statistical Abstracts of Haryana, 1989-90). The cattle population was 54% of total bovine population in the year 1966 which decreased to become nearly one third (34%) in the year 1992 & 1997 and further to 20% in 2003 census. It is noteworthy that this decrease occurred despite a marked increase in the population of crossbred cattle promoted through intensive crossbreeding programme in the milk shed areas in the last two decades. A recent random sample survey
conducted in districts of Rohtak, Sonepat and Bhiwani further reinforced the earlier belief on the fast changing cattle population in the area. Even those pockets of the breeding tract which were famous for the high density of purebred Hariana cattle now contain only 15.7% Hariana cattle in total bovine population ranging from 13.5 to 17.7%. In fact only a third or fourth household in the villages surveyed possessed Hariana cattle. This survey also suggested that apart from the declining population, Hariana cattle have also deteriorated in their productivity. A closer examination of morphological characteristics of animals also led to a speculative inference that mixing of germplasm of Tharparkar, Nagori and other cattle breeds from the adjoining areas is endemic. The published literature on Hariana cattle is sketchy and scattered. Apart from this, unpublished information too exists in the records of state farms or annual report of the ICAR institutes/ SAUs and Gaushala’s. However, no attempt has been made to systematically compile and evaluate the available information on Hariana cattle. Considering the importance an initial attempt has been made to collect and collate all the available information on Hariana cattle (Joshi et al., 1995). This information is based on available literature which lacks the practices related to rearing of Hariana cattle as observed at farmer’s doors.

Therefore, before preparing any meaningful policy guidelines for improvement and conservation program for Hariana breed, investigation needs to be conducted to make an objective assessment of the prevailing biophysical and socio-economical characteristics of the habitat, status of the breed in terms of population and productivity parameters, management practices, availability of local feed and fodder, infrastructural framework etc. Apart from this, husbandry practices being followed and the existing conditions at farmer’s houses should be taken into consideration.
Keeping in view of the above, the present study entitled "Production system analysis of Hariana Breed of cattle in its breeding tract" has been undertaken with the following objectives.

**Objectives:**

1. To document the existing management practices of Hariana breed in Haryana.

2. To investigate body condition score and productive performance of cows under existing managerial conditions.

3. To identify the constraints in adoption of Hariana cattle and advanced management practices in rural areas of Haryana.