The chapter I discusses about the environmental externalities in relation to the poultry farms built in rural and urban areas. The survey was conducted to examine environmental flaws in construction of the poultry houses and determine causes of poultry losses in five districts of West Bengal. Both, the qualitative and quantitative data were captured through a structured questionnaire administered to various households. The majority of the farmers in the study kept indigenous chicken and the remainder had exotic broilers and layers. In terms of management, indigenous chicken survived mainly through scavenging with minimal or no supplementary feed provided. The protein supply may be critical, particularly during the drier months of the year, whereas energy may be critical during the rainy season. Hence, to improve the nutrition of village chicken, and subsequently their productivity, supplementary feeding may be necessary. Health management was also poor, with minimal use of veterinary therapeutic intervention in the event of disease outbreak. Control of diseases can be achieved through improvement in veterinary and advisory services. To this end, veterinary drugs should be made available and affordable in the vicinity of the poultry farmers to allow for immediate reaction to a disease outbreak. Reasons given for high mortality during the hot season were improper housing and the heat. In addition, mortality was highest in young chicks, particularly during the first three weeks after hatching. The most common type of housing observed in the study area is a raised structure made from locally available materials such as wood, thatch, bricks and sometimes scraps metal. It is known that lack of proper shelter for the chicken immediately after hatching results in high mortality, as the chicks are exposed to the vagaries of nature and are prime target for carnivores such as birds, dogs, cats and snakes. A slight change in management techniques can reduce this kind of loss substantially, such as, provision of a wire
mesh cage with adequate ventilation and drainage, at least for the first four to five weeks after hatching.

Therefore, major findings of this study were that there is abundance of indigenous chicken and farmers attach great importance to them in their daily lives but take little care of them. However, the farmers are aware of the potential benefits that can accrue from improving productivity of poultry. Given the opportunity, farmers would like to improve poultry housing and care of chicks, improve on disease prevention and control, particularly coccidiosis.

The chapter II confined survey and identification of *Eimena* species found in chicken. It is important to note as many of the morphological details of sporulated oocysts as can be identified when describing eimerid coccidia. Life cycle details and cross transmission studies (Hnida and Duszynski, 1999) helps to make specific identification of morphologically similar sporulated oocysts from closely related hosts, and are also essential for identification of the potential host range of polyxenous coccidia (Tenter and Jhonson, 1997; Mugridge et al. 1999, Tenter et al. 2000).

Results obtained from the study in chapter III demonstrated a clear pathological and histological alterations in the *Eimeria tenella* infected birds. Furthermore, the data of the experiment revealed that the alterations were clear in different post infection periods (i.e., twenty four, seventy two and one hundred and forty four hours) and more prominent in the bird of higher post infection periods (one hundred and forty four hours).

Chapter IV describes the study of determination of the optimum stocking density for maximum growth and production of broiler through cost benefit analysis of small broiler rearing poultry house. Result of the study clearly revealed that the maximum production was encountered in the SD33 (1.5 sq ft per bird) density of birds for forty-five days production cycle of broiler rearing. This density of bird rearing appeared to be far more practical according to the working principle for carrying capacity and management of poultry farming because over population causes severe hazards in the environment of the poultry house affecting the health of birds.
Animal welfare has generated concerns from the domestic and global market sectors. In the United States of America, the National Council of Chain Restaurants and the Food Marketing Institute are certifying auditors for their animal welfare audit programme. The National Chicken Council has established in 2005 a voluntary welfare audit programme for broiler companies to follow so that welfare concerns are being addressed. High stocking density has been reported to increase ammonia production, foot pad lesions, litter moisture, locomotion, heat stress, and preening (Cravener et al. 1992). As a result, welfare specialists have suggested reducing stocking density from forty-three to thirty kg of body weight per sq m when broilers are grown to heavy weights. The optimum density for broilers marketed to heavy weights is debated among broiler companies, contract growers, and welfare auditors. Numerous studies have demonstrated that increasing placement density adversely affects growth performance, carcass yield, and skin scratches and tears (Bilgili and Hess, 1995 and Feddes et al 2002) In practice, optimum density based on profit margins typically exceeds the recommendation based on welfare and bird performance. Stocking density research reported in the literature is limited on production parameters, meat yield, and litter quality of broilers grown to body weight of three kg.

Further research should address the interrelationships of feeder space and stocking density of broilers grown to heavy weights because the effects of stocking density on feed and water consumption are closely related. Regarding this relationship, study done by Bandyopadhyay et al. 2006b has clearly demonstrated that stocking density affects the rate of feed consumption, water intake, feces production and growth of birds.

Chapter V incorporates determination of the comparative efficacy of three medicinal plants for control of coccidiosis and broiler performance. For many years, prophylactic use of anticoccidial drugs has been the primary means of controlling chicken coccidiosis in broiler industry and has played a major role in the growth of this industry. Also the use of live vaccines is well established in the control of the disease. The mounting problem of drug resistance of *Eimeria*
species has prompted major research efforts to seek alternative means of control through increased knowledge of understanding the immunomodulation, natural-product feed additives, and advances in live and recombinant vaccines.

Research into ethnoveterinary medicine is often undertaken as part of a community-based approach that serves to improve animal health and provide basic veterinary services in rural areas. Herbal medicines have always been a form of therapy for livestock among resource poor small holder farmers. There is, however, little documentation of the use of ethno veterinary medicines, as many researchers and health practitioners view these practices as backward.

Documentation of herbal plants is necessary because they are likely to be more important in the future, especially given the escalating costs of drugs and the focus on organic products in most developing countries. In addition, with the development of resistance of pathogens to drugs, ethno veterinary medicine might be the route to take since herbs tend to have broad spectrum.

This study was undertaken with the understanding that the use of safe and effective medicinal plants can reduce farmers' input costs, preserve the resource base, enhance biodiversity and protect animal health. If plants are grown on-farm this will enhance the biological interactions on which productive agriculture depends. Successful medicinal plant use can contribute to farm incomes, maintain the resilience of farm communities, promote self-reliance and contribute to an internationally recognized safe and good quality food supply, in addition to providing improved and affordable livestock health care. It can also strengthen rural community capacity building, leadership and skills development and help preserve the ethno medicinal heritage of the country.

The use of medicinal plants is an option for livestock farmers who are not allowed to use allopathic drugs under certified organic programs or cannot afford to use allopathic drugs for minor health problems of livestock. Scientists may be motivated to conduct formal validation on plants that they know are being used for specific purposes by subjecting medicinal plants to clinical trials.