BUSINESS PERFORMANCE OF EMU FARMING IN DHARWAD DISTRICT

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INTRODUCTION

Agriculture plays an important role in the Indian economy. From times immemorial, agriculture has occupied a pivotal position in India's economic development and it has been regarded as a major economic powerhouse that has a bearing on the whole economy. It has been realized that the success of economic planning in India largely depends on the growth of agricultural sector.

The agricultural sector has been accorded top priority since independence. A cursory look at the growth of agriculture in the past five decades indicates that agricultural production has reached comfortable heights especially after the Green Revolution. India has reached a stage of self sufficiency, but it is still dominated by nature, which means that the instability still haunts agricultural sector and seriously threatens the Indian farmers' ability to step up the agricultural output and their viability.

More than 70 percent of India's population lives in rural areas. Consequently, there is likely to be more pressure on land as almost all the village population depends on agriculture, resulting in an unfavorable land man ratio. Owing to the population explosion with the increasing pressure on land, agriculture alone cannot provide gainful employment to all the rural folk. Therefore, allied activities like dairy, poultry, sheep, piggery, fisheries etc have been accepted as effective means of employment and income generating instruments.

Agriculture and livestock are inter-dependent in our economy and livestock has been recognized as an important approach for sustained livelihood. Livestock activities provide manure and draught power required for agriculture in addition to contributing the products like milk, meat, eggs etc, while the crop residues form the major source of feed to livestock and this system of interdependence has sustained for centuries. Livestock are important sources of income and employment in rural sector. They help to meet the equity objective in rural development through their contribution to the cash income of small and marginal farmers and landless labourers. India has made remarkable stride in the area of livestock population in the world. Animal husbandry has been an inseparable part of human civilization and culture from the very ancient period. It is also emphasized in Vedas and Puranas that possessing livestock is a symbol of prosperity.

In India, no problem is as grave and alarming as that of unemployment. Poverty and unemployment coupled with glaring inequalities of income and consumption constitute a big challenge to economic development. In this context, a relatively recent addition to animal production activities in India that holds the promise of stable income and gainful employment is that of Emu rearing.

Emu (pronounced E-moo in the United States or E-mew in Australia) is the second largest flightless bird under the group ratites. Emu is scientifically classified as Dromaius Noveahollandiae. It is comprised of three sub species which are inter breeding in the wild as well as on farms. These are Dromaius novaehollandiae novaehollandiae, Dromaius novaehollandiae woodwardi and Dromaius novaehollandiae rothschildi. Emu is originally from Australia and is in the ratite family of birds. There are only five birds in the ratite family: ostrich, Emu, cassowary, rhea and kiwi. 'Ratite' has Latin root meaning raft. This is so because of their breastbone, which is flat. There is no breast meat like in chicken, which has a keel type breastbone. Because of this flat breast bone, ratites do not fly. Aborigines in Australia utilized these birds for their basic needs like food, clothing and for treatment. It is a sober bird living on grains. Its immune system is so strong that it hardly suffers from any disease. It survives in any type of climate. Each and every part of the bird has commercial value.

Origin of Emu farming

Emus have been found in the mainland of Australia for over 60,000 years and it was only in 1970s that the Australian Government gave permission to domesticate Emu birds and the first Emu farm was established in Wiluna in 1976. Western Australia was the first State in Australia to allow commercial Emu farming in 1970, with the approval given in Queensland in 1987 to the Cherbourg Aboriginal Community to capture 300 wild Emus for a primary breeding stock.

The United States first imported Emus between 1930 and 1950. However, commercial Emu farming in the U.S. did not begin until the late 1980's. This industry then spread to Europe in the early eighties and then to Asia and Africa. Today, Emus are reared all over the world and their current population is estimated to be around 0.7 million (2009) and their status is of "least concern" according to the Bird life International reports (IUCN, 2010). However, in the wild, Emu population has not increased and has become extinct, and in several other parts of Australia, it is considered to be

endangered (Sales, 2009). Wild Emus are formally protected in Australia under the Environment Protection and Biodiversity Conservation Act, 1999.

During most of the twentieth century, the Australian Commonwealth's Nature Conservation Act prohibited the capturing or killing of native Emus in the wild. In 1987, the state of Western Australia legalized the farming of Emu birds and the commercial Australian Emu industry began. By 1994, all Australian states permitted the farming of Emu birds and that year, approximately 75000 Emus were being farmed. By 1995, the number rose to more than 2,00,000 with approximately 1300 properties registered as Emu farms. In 1996, it was realized that there was an over supply of Emu products on the market and Emu farming rapidly became unprofitable. From 1996, the estimated number of Emus being farmed in Australia fell from over 2,00,000 down to 18,600 as of March 2005. The number of properties identified as Emu farms is currently 144 with most of these not involved in commercial production and many having less than 10 birds. Emu farms are currently registered in Western Australia, South Australia, Tasmania, Victoria, New South Wales and Queensland. Each of these states has a small number of commercial farms.

Features of Emu birds:

Emu chicks, when hatch out, have body stripes similar to squirrel. Later, as they grow after three months, they lose the stripes to turn into brownish black feathers. Adult Emu will be a large bird up to 6 feet height with long neck and small naked head. Adults usually weigh 45 to 60 kg. Legs are long and covered by scaly skin having three toes. Entire body is covered by long feathers except part of the neck. Emu birds are raised throughout the world and have adapted to a variety of conditions ranging from the cold winters to the extreme heat. They are friendly birds, which can easily live in the grassy plains and dry open farms. Normally, Emu live up to the age of 30-40 years. Emu eat fruits, flowers, insects, seeds and green vegetation; they love caterpillars. Emu require food three times and 6-10 liters of good water daily.

Breeding of Emus:

Emus attain sexual maturity by 18 to 24 months. Breeding occurs during winter season of the geographical areas. In commercial farming, Emus are paired in separate enclosures after maturity depending on the compatibility of the pair. Emu generally gives eggs during evening between 5.30 p.m.to 7.00 p.m. Each adult Emu, after three years, can give on an average 30 eggs during breeding season between October to February. Emu eggs are emerald green in colour weighing about 600 to 800 grams. Eggs are collected on regular basis and are stored in a cooler with maximum temperature of 60˚F for upto one week. Later, they are set in incubator machines which are specially designed to hold Emu eggs with a dry bulb temperature of about 96˚ to 97˚F and wet bulb temperature of about 78˚ to 80˚F (about 43% relative humidity) up to 48th day with regular turning mechanism every one hour. Emu chicks hatch out on 52nd day naturally; some times assisted hatch is also carried out manually by helping the chick to come out by opening the shell at the head and toe positions. The normal hatchability is about 80 per cent.

Chick management:

Emu chicks weigh about 370 to 450 g (about 67% of egg weight) depending on the size of egg. First 48-72 hours, Emu chicks are restricted to incubator for quick absorption of the yolk and proper drying. Emu chicks can be grown successfully in a wide range of environments and climatic conditions as long as their needs for normal growth are met and adequate care provided. Emu chicks are big in size but challenging to raise compared to any other chicks as they are more vulnerable to their environment during the first few weeks of their life due to improper humidity control in the incubators and hatchers resulting in a large yolk to be absorbed, which often leads to leg problems.

As the chicks can not regulate their body temperature, it is necessary to provide a source of heat like the electric bulbs, room heaters, gas brooders, wood or coal brooders or any other device that gives and maintains approx 90˚ F during the first two weeks. Supplemental heat will not be required after 4 - 5 weeks. Properly maintained brooding area temperature improves chick comfort, speeds up growth rate, feed intake and chicks activity.

Precautions in Emu farming:

Emu farm should ideally be placed away from the population. The fencing should be proper with adequate breeding facilities. Proper disinfection procedures/ foot dips etc. should be maintained.

Water source should be tested for minerals and possible contamination. Other birds and pets should not be reared/allowed to enter the same farm. The brooding space should be optimum. Proper storage of feed to prevent contamination is necessary. There should be facility for disposing of/destroying the dead birds. The equipment should be properly disinfected and separated.

Commercial Emu products:

(A) Eggs:

Emu egg is the most important among various products in Emu farming. A single bird gives 20-40 eggs every year. These eggs have dark green colour and each egg weighs 400-600 gms. Price of one egg ranges between ₹ 1200- ₹ 1500.

(B) Chicks:

Emu chick weighs approximately 70% of Emu egg weight. Emu chick breeds naturally or by using incubator. Artificial incubation is often conducted at a temperature of approximately 97˚F. Average incubation time ranges from 48 to 52 days. New born chick colour is coffee brown with white line marks and this color will change after 3 months. Nutritious food and purified water is a must up to three months. Three months old chick can either be grown for future reproduction and/ or can be sold for other farmers to begin farming. Price of three month old chick ranges between ₹ 2500- ₹ 3000.

(C) Meat:

Meat of Emu bird is reddish in colour, soft and 98% fat free. Emu meat is lower in fat than Chicken, Turkey, Pork and Beef. It is the Super Food of the New Millennium. It commands higher price than the meat from other birds/animal and is reported to be setting at ₹ 300- ₹ 450 per Kg. The American Heart Association has included Emu meat in its listing of heart healthy meats.

(D) Oil:

This is an important product in Emu farming. It is extracted from the fat oil. This oil gets absorbed in human skin within 4-5 seconds and reaches the bones. Traditionally, Emu oil has been used for treatment of muscle and joint pains. Clinical experience with Emu oil has shown that its two major benefits are its anti-inflammatory properties and its ability to penetrate into the skin. It also appears to provide some solar protection. The penetrating effect appears to be related to its non-phosphorous composition.

Researchers who have analyzed the oil found that there is a compound in oil that they believe is the key to its effectiveness. This compound molecule is believed to be collagen. Collagen is found in chickens and turkeys in a much diluted form. However, the test result on the Emu has showed this molecule to be present in an extremely concentrated form. Research and development on Emu oil usage in cosmetics and pharmaceuticals is rapidly expanding. At present, market price of one litre refined Emu oil is ₹ 3000 - ₹ 4000. Emu oil has been documented to exhibit the following properties.

- Anti-inflammatory
- Moisturizing
- Cholesterol reducer
- Penetration enhancer
- Significant epidermal proliferative activity
- Significant wound healing agent
- Faster healing of burns with less pain and scarring
- Anti-arthritic activity

(E) Emu feathers, skin and nails:

(i) Feathers

Feathers are double quilted, attractive and velvety to the touch. They are soft, light and non-allergic, which makes them ideal material for a host of applications. They are in demand both in the fashion and in art and craft industries. They are used for feather duster, feather pad, fans, bows,

masks, finishing metals prior to painting, weather-proof apparels, pillows, blazers, sweaters, jewelry and craft items.

(ii) Skin

Skin is very soft and smooth; hence it has a great demand in international leather industry for producing new fashionable goods. A variety of goods can be produced from Emu skin. A fully grown up bird can yield 6 to 8 square feet of leather. Emu skin is also a good option for crocodile skin, as Emu leg skin is easily available and has same look and feel.

(iii) Nails

Nails are polished, finished and designed in different ways to be used as various jewelry pieces for woman.

EMU FARMING IN INDIA:

Businesses such as poultry, dairy, sheep or goat often suffer due to various factors such as eruption and spread of infectious and contagious diseases, climatic changes, excessive heat and scarcity of water resulting in sudden fall in production. Emu is naturally immune to all these adversities. Hence, Emu farming is preferred all over the world today. Emu farming as complementary to agriculture.

In India, an Emu farm by name Vijaya Ratite Farm (Pvt.) Ltd. was established by Shri P. Satyanarayana in Andhra Pradesh in 1996. Similarly, in Maharashtra state, Shri. Ganesh Kale & Group introduced 20 pairs of Emu during 2001. In Baramati, Shri. Sandip Taware established first Emu Farm with 10 pairs in April 2002. Emu farming in India is presently concentrated in Southern States. Farmers buy birds from big breeders and have option of becoming self sustained breeders to produce chicks for sale, or integrated farmers to sell hatching eggs back to the integrators. The sale of Emu products in India is yet to take shape due to lack of awareness and non-availability of sufficient Emu population.

Present estimate of Emu population in India is above two lakhs. The biggest Farm is located in Andhra Pradesh with 6000 Emus at one place. Vijayawada, West Godavari, Hyderabad, Chittoor and Nellore in Andra Pradesh; Coimbatore, Namakkal, Erode and Hosur in Tamil Nadu; Bangalore, Mysore, Gokak, Hubli etc in Karnataka; Pune and Nasik in Maharashtra are major production belts for Emus.

The Government as per 1972 forest animal husbandry act for protection and rearing of forest animals, has permitted Emu farming, which offers great opportunity for foreign investments and export. Emu farming is a big venture with a huge growth potential. Emus are tough birds and are even immune to bird flu, but have to be protected from other specific diseases including encephalitis. With a little effort, Emu farmers can sit back and count their money, if they get together to promote Emu meat in households as well as hotel menus. Due to growing awareness of eating healthy, Emu meat has started getting into demand in India too. With the increasing acceptability of alternative medicines, Emu oil containing the pain-relieving oleic acid believed to be good for arthritis, has a huge commercial potential. Leather products from Emu skin, made on a pilot basis by the Central Leather Research Institute, were showcased at Delhi's Pragati Maidan some years ago to a great acclaim by the visitors.

There are four Emu Associations in India. They are;

1. Indian Emu Association, Hyderabad

2. National Emu Association, Mumbai

3. Maharashtra - Maha Emu Association, Baramati, Maharastra

4. EMU Farmer Association, Pune

Emu farming in Karnataka

In Karnataka, Rangrej Emu Farm is one of the pioneers in starting of emu farms in Karnataka. They started farming in 2003 and currently have more than 800 birds at the farm which is spread across more than three acres at Bangalore. Fongeee Emu farm, Sai Emu farm and Tall bird Emu farms have sub units of both large scale and small scale farming in different locations in South Karnataka. Presently, there are about 200 farms in Karnataka with more than 2.5 lakhs of birds. Hubli,

Bagalkot, Jamakandi, Koppal and Gokak are important locations in North Karnataka, where Emu farming in large scale can be seen.

Not much work has been done on the management and economic aspects of Emu farming. This activity which has a great potential for income and employment generation at commercial as well as small scale needs to be investigated. The present study is an attempt in this direction. This study is proposed to address the business activities of emu farming in Dharwad district, which is the major Emu farming district in North Karnataka. The present study was conducted with following objectives:

1. To study the socio-economic conditions of farmers engaged in Emu farming.

2. To study the investment pattern for Emu farms.

3. To analyse the business performance of Emu farms.

4. To study the existing marketing arrangements for Emu farming products.

5. To analyse the problems encountered in production and marketing of Emu products.

PRESENTATION OF THE STUDY:

The study is presented in six chapters.

- The first chapter deals with the introduction and objectives.
- The second chapter presents review of literature on the related topics.
- The third chapter outlines the features of the study area, sampling framework, analytical tools and specifies the concepts used in the study.
- The fourth chapter presents the results obtained in the study.
- The fifth chapter discusses the results of the study.
- The sixth and final chapter presents the summary and policy implications

REVIEW OF LITERATURE

In this chapter, an effort has been made to critically review the literature on the past research work relevant to the present study. Since not much work has been done on the business performance of Emu farming, the available literature on the related aspects has been reviewed and presented under the following sections namely,

2.1 The socio-economic conditions of farmers engaged in rearing of animals

2.2 Investment pattern

2.3 Business performance of enterprises

2.4 Marketing arrangements for farm products

2.5 Problems associated with livestock enterprise

2.1 SOCIO-ECONOMIC CONDITIONS OF FARMERS ENGAGED IN REARING OF ANIMALS

Dahiya and Aggarwal (1993) studied the impact of socio-economic factors on the adoption of poultry farming in three districts of Haryana. Results indicated that high caste Hindus had a tendency to initiate poultry business. A majority had matriculation or graduation. As many as 70 per cent owners were aged between 20 and 50 years. Only, 20 per cent of new poultry farmers entered the business without any training.

Angadi (1999) who conducted a study in Bagalkot district of Karnataka state reported that a majority (65 per cent) of the pomegranate growers were middle aged. The respondents below 35 years of age were 18.75 per cent, while 16.25 per cent were old aged.

Jha *et al.* (2000) found in their study in Birchpur village of Karnal district of Haryana that 41.40 per cent of the respondents (dairy farmers) were illiterate, and 23.77 per cent, 20.90 per cent, and 3.27 per cent had high school, middle school and college level of education respectively. Regarding land holdings, they found that 29.51 per cent, 26.23 per cent, 28.28 per cent, 14.75 per cent and 1.23 per cent of the farmers were landless, marginal, small, medium and large farmers respectively.

Babanna (2001) conducted a study on arecanut growers of Shimoga district in Karnataka. The results revealed that 61.60 per cent of the respondents belonged to medium income group while 23.40 and 15 per cent were under low and high income group respectively.

Arunkumar (2002) in his study on vegetable producing contract farmers of Belgum district of Karnataka reported that the average age of farmers was 42 years of which 58 per cent belonged to middle age group, while 18 per cent and 24 per cent were in young age and old age category respectively.

Sunil kumar (2004) conducted a study on tomato growers in Belgum district of Karnataka and found that a majority of respondents belonged to medium income category (48.33 per cent) followed by 32.50 per cent and 19.16 per cent under low and high income category respectively.

Veeranna *et al.* (2004) in their study on economic structure of goat farming in selected district of North Karnataka revealed that more number of farmers preferred goat farming with a combination of cow. They also noticed that the farmers who were maintaining single goat species were entirely landless. Five farmers had 2 hectares of land and nine farmers had more than two hectares.

Senthil and Meganathan (2005) studied the socio-economic characteristics of sheep rearers in Tamil Nadu. They concluded that as the land holding size increased, the sheep flock size decreased. They also opined that among the respondents with small farms (10-25 sheep), 14.28 per cent were illiterates and 42.86 per cent had primary education as compared to 18.18 per cent illiterates and 45.45 per cent with primary education in medium (26-40 sheep) farms. In large farms (>41 sheep), 48.33 per cent had primary education. None had collegiate level of education in any of farm size groups.

Hossain *et al.* (2005) in their study on small scale dairy farming practice in selected areas of Bangladesh opined that 53 per cent of the respondents took dairying as a subsidiary occupation and 47 per cent took it as main occupation. They concluded that majority of the dairy farm owners had

secondary level education (60%). The average number of animals per farm was 13 and most of the farmers (90%) used tin shed and straw shed to house their cattle.

A study on socio-economic characterization of goat farms in Brazil was undertaken by Alves and Mello (2005). They concluded that 63 per cent of farms were under 25 ha, 14 per cent between 25 and 50 ha, and 23 per cent between 50 and 200 ha. They also noticed low level of education among the rearers. They observed that 82.85 per cent farms were having electricity facility and 51.42 per cent of the farms had telephone facility.

Baghat *et al.* (2005) conducted a study in Maharashtra regarding farmers' perception of rearing cross bred cows. The study revealed that most of the farmers reared cross bred cows irrespective of educational status and landholding category and they considered it as economically affordable.

A study was conducted to explore the socio-economic status of shepherds in Sonadi of Rajasthan by Tailor *et al.* (2005). They observed that the overall literacy rate in adult males (26.32%) was more than that of adult females (2.70%) and the average number of total livestock maintained was 53.1 units with 9.3 units of small ruminants and 2.8 units of large ruminants. The overall average income through sale of milk of sheep and other animals was ₹ 281.81, with overall income from milk sale of ₹ 500.01 per family per year.

Shivakumar *et al.* (2006) studied the strategies for enhancing the economic status of pig farmers in Kancheepuram district of Tamil Nadu. It was observed that most of the farmers were illiterate (57.78%), landless farmers and were traditional growers rearing pigs for more than fifty years.

Kumar *et al.* (2006) studied the management practice of Sahiwal cows in Punjab during 2003. They observed that all the farmers were landless. They were educated upto primary standard (77.14%) and had large family size of more than 8 members (50%).

Singh *et al.* (2006) studied the socio-economic aspects of sheep and goat flock owners during 2001-02 in Himachal Pradesh. Their study revealed that about 46 per cent were small and 54 per cent were large, maintaining 34 and 66 per cent of the total animals, respectively. The share of goats was higher on small (35%) than on large flocks. The average family size and land holding varied widely according to flock-size. The average size of landholding was 0.30 ha for small and 0.77 ha for large flock-owners.

Sridhar (2008) studied contract farming in maize in Davangere and Haveri districts of Karnataka. The average age of contract farmer was 43 years. In the case of non contract farmers, it was 47 years. The annual income was found to be ₹ 73,823 per family in contract farmer, whereas in the case of non-contract farmer, the annual income was ₹ 66,950 per family. 21.66 per cent of the contract farmers were illiterate and 78.39 per cent were literate. In the case of noncontract farmers, 23.34 per cent were illiterates and 76.66 per cent were literates.

Sharanesh jalihal (2009) studied contract farming in medicinal plants in Karnataka. The average age of contract farmers was 37 years with an average family size of six members. The annual income was found to be ₹ 66,750 per family. 35 per cent of the farmers were illiterates and remaining 65 per cent were literates. Among the literates 53.85, 30.70, and 15.38 per cent farmers studied upto high school, primary school and college respectively.

Calbar (2010) studied the socio-economic profile of cattle farmers in three agricultural zones of Oyo State of Nigeria and their perception of milk production as a principal income generating activity. A total of 90 respondents were interviewed using well-structured questionnaires and data collected was analysed using descriptive methods. Survey results revealed that 90% of the respondents were married with majority falling within the age range of 21 and 50 years. 10. 85 per cent of the respondents had primary school education while 15 per cent had no formal education. Most of the respondents (93%) were engaged in livestock farming as their main occupation and crop production as a secondary occupation.

2.2 INVESTMENT PATTERN

Venkatasheshaiah (1992) evaluated groundnut processing units in Andra Pradesh. It was found that there was a direct relationship between the total capital invested and the size of oil mills. It was also indicated that the capital requirement per quintal of oil production was ₹ 161.01 in baby expeller mills, ₹ 112.24 in 2- chamber expeller mills and ₹ 83.86 in 3-chamber expeller mills.

Amrutha (1994) studied economics of processing paddy into Rice, Poha, Murmura and Popped rice in Chitradurga and Dharwad districts of Karnataka State. The results showed that the capital investment on rice mill, poha mills, murmura mills and popped rice units was ₹ 17, 92,250, ₹ 5, 33,225, ₹ 16,740 and ₹ 20,786 respectively.

Singh *et al.* (1994) while studying the economics of marketing and processing of pulses in Bhundelkhand region (Uttar Pradesh), estimated that of the total cost, land/building accounted for the highest share (51.97 %) followed by machinery and equipment (40%), electricity fitting (4.72 %) and other fixed capitals (3.31 %) in arhar processing plant. In the case of grain processing unit, land/building, machinery, electricity and other fixed capital accounted for 50.26, 42.19, 4.77 and 2.78 per cent, respectively.

Maurya *et al.* (1995) in their study on economics of production and processing of Aonla in Varanasi district of Uttar Pradesh worked out the cost of Aonla processing plant and its establishment. The total establishment cost (fixed cost) per quintal was Rs. 8.00. It was the highest for depreciation (₹. 3.40/q) followed by interest on fixed capital (₹. 2.50/q), insurance (₹. 1.00/q), maintenance cost (₹. 0.60/q) and electricity and water charges (₹.0.50/q).

Rachhapal and Darshan (1996) conducted a study to examine the performance of cooperative sector infrastructure in Punjab market canneries. The study showed that the gross value of the fixed assets stood at ₹ 152.77 lakhs. The depreciation accumulated was ₹ 92.13 lakhs. The present value of fixed assets was computed at ₹ 60.64 lakhs.

Dev (1998) in his study on management appraisal of cashew processing industry in Uttar Kannad found that the total capital investment directly varied with the size of the unit. Further, he concluded that the total capital investment was ₹ 117.5 lakhs for large scale units and ₹ 36.32 lakhs for small scale units, wherein the marketing capital accounted for about 25 per cent of the total capital investment with a majority of the fixed capital investment of about (80%) made in building and machinery.

Joshi *et al.* (1999) studied the capital investment pattern in the home, cottage, small and large scale mango pulp processing units. Fixed capital was ₹ 1.01 lakh, ₹ 1.6 lakh, ₹ 1.8 lakh and ₹ 20.7 lakhs and the working capital ₹ 2.25 lakh, ₹ 11.35 lakh, ₹ 4.34 lakh and ₹ 21.03 lakhs, respectively. The working capital had a larger proportion than fixed capital in all the categories. Analysis also indicated processing of mango pulp was more economical as indicated by higher scale efficiency than all the other categories.

Veena and Tajinder (2000) had studied performance analysis of Bhagpur and Jargoan Sugar Mills of Ludhiana district in Punjab. They found that production cost of sugar in Bhagpur Sugar Mill was ₹12.37 per kg and it was ₹. 9.89 per kg in Jargaon Sugar Mill. The expense on raw material was the major item of the total cost.

Manjunath (2004) evaluated the performance of fruits and vegetable processing units of Bangalore district which revealed that the total cost of processing amounted to ₹ 31147.38 and ₹ 33890.37 per tonne of processed products in private and public sector units, respectively.

Siddaram (2004) studied the investment pattern in the processing units. It clearly showed that plant, machinery and equipments formed major component of investment accounting for 50.12 per cent followed by building and civil structures (33.35 per cent), cost of land (9.02 per cent) and infrastructure facilities (6.69 per cent). The investment on plant, machinery and equipments was ₹ 150.36 lakhs followed by building and civil structures (₹ 100.05 lakhs) and cost of land (₹ 27.05 lakhs). Investment on infrastructure facilities, office and fixtures and miscellaneous fixed assets contributed to an extent of 7.51 per cent, envisaging total investment of ₹ 300.03 lakhs in the co-operative processing unit. Investment on infrastructure facility structures, office fixtures and miscellaneous fixed assets contributed to an extent of 7.49 per cent, envisaging total investment of ₹ 500.98 lakhs in private processing unit.

Shwetha (2010) reported that the total investment in modern rice mills was ten times higher (₹ 379.25 lakhs) as compared to conventional rice mills (₹ 36.97 lakhs). The net present value for modern unit and conventional unit was ₹ 408.35 lakhs and ₹ 27.55 lakhs respectively. The capacity utilization was higher (68%) in modern units in comparison with conventional units (44%). The total returns obtained from both rice milling and poha making processes were higher in modern rice units (₹ 1478) as compared to conventional units (₹ 1381). This showed that the modern rice mills were more efficient than the conventional rice mills. Procurement costs were lower when paddy was

purchased directly from farmers instead of purchasing commission agents. It was infered that mills would benefit from strong contractual arrangements with paddy growers.

Chadachal (2012) studied production and marketing management of orchids in Uttar Karnataka District. She studied the investment pattern and establishment of orchids. The total cost of establishment was found out to be ₹ 2,32,920 per gunta of which material cost constituted 94.97 per cent and maintenance cost 5.33 per cent. The construction of green house, well and planting material formed bulk of the establishment cost.

2.3 BUSINESS PERFORMANCE OF ENTERPRISES

Vliegar (1983) studied the economics of contract production in pig farming in Holland. He reported that majority of the costs inured by the farmers pertained to the maintenance of animals at rational stage of production, wherein consumption starts doubling every week.

Ram Mohana Rao and Nagabushanam (1985) conducted a study around Mysore city and found that the per centage of pre laying cost to the total cost was 29.02 per cent, 24.80 per cent, 29.41 per cent and 20.42 per cent in group I, group II, group III and group IV farms respectively. The cost of laying period to total cost was 70.98 per cent, 70.59 per cent, 70.54 per cent, 70.48 per cent for group I , group II, group III and group IV farms respectively. Further, they observed that feed cost accounted for 69.38 per cent of total costs of production. The gross returns per layer in different size groups ranged from ₹ 125.13 to ₹ 130.17 and net return ranged from ₹ 16.93 to ₹ 47.47.

Srivastava *et al*. (1986) conducted a study in which they concluded that the feed cost constituted a major part (54.70%) of the total cost in chick rearing. The cost of day old chicks constituted 19.86 per cent. On an average total cost incurred on poultry farms was estimated at ₹ 118.85, ₹ 115.40 and ₹ 110.06 in small, medium and large farms respectively. Further, they estimated the net returns per bird per year which was higher in the case of large size poultry unit (₹ 27.87) as compared to medium farms (₹ 23.63) and small farms (₹ 19.68).

Ramesh (1990) conducted a research study on the economics of sheep rearing in Bangarupet taluk of Kolar district of Karnataka. He found that the total costs in small (No $\leq$ 20) and large (No $\geq$ 20) flocks were ₹ 3611.15, ₹ 5703.19 and corresponding gross returns were ₹ 4410.12 and ₹ 7071.50 respectively.

Deoghare and Bhattacharya (1993) studied the costs and returns of goat keeping. Data were collected from 80 goat-rearing households in Mathura, UP. The income from milk, sale of animals, manure and stock acceleration was analyzed. Large flocks (>10 goats), medium flocks (6-10 goats) were better managed than small flocks (2-5 goat). Capital investment per goat was ₹ 813, ₹ 732 and ₹ 780 for small, medium and large flocks respectively. The net income from small, medium and large flock was ₹ 146, ₹ 296 and ₹ 616 respectively.

Padmanaban (1994) analysed sheep farming in Tamil Nadu. The average income from sheep per farm was ₹ 2,699.97. The income from wool was negligible at 0.34 per cent. The average annual income and net income per sheep was ₹ 222.23 and ₹ 64.36 respectively.

Francis (1994) studied the goat rearing challenges and opportunities at the state bank institute of rural development, Hyderabad. It was found that Goat rearing under stalled conditions was encouraged as it was sustainable in nature and provided income and self employment. He estimated total investment of ₹ 58,600 which comprised investment on goats, shed and equipments. The total recurring expense per year per goat was ₹ 50,900. The gross and net profits were ₹ 19,220 and ₹ 10,137 per year respectively.

Shah and Singh (1995) studied costs and returns in crossbred cows in rural and urban area of Barielly district of Uttar Pradesh. It was evident from the study that the total cost per cow in one complete lactation was ₹ 5,403.39, with a total return of ₹ 8,288.02 and net profit of ₹ 2,884.63 in the rural area. The results further revealed that the total cost, total return and net profit in urban area were ₹ 5,760.74, ₹ 9,295.85 and ₹ 3,535.09 respectively. Thus, it was clear from the study that the net profit, total costs and total returns were higher in urban area as compared to rural area.

Tripathi (1997) studied the costs and returns of Angora rabbit rearing in high-hills of Uttar Pradesh. He found that the cost of rabbit rearing was ₹ 32,344.6 per unit (18 angora rabbits). The highest share of the total cost of rabbit rearing was on feed which accounted for about 71 per cent of

total cost followed by overhead cost (about 18%) and the labour cost (11 per cent). They also noticed that the gross returns from the enterprise was ₹ 57,525.46 per unit per year. The average net income was ₹ 25,180.80 per unit per year.

Verma and Singh (1997) studied the effect of farm size, educational level and occupational status of entrepreneurs on the economics of egg production in Haldwani area of Nainital district. The total cost per bird was ₹ 381.59. The average gross returns per bird were ₹ 399.49. Income from the sale of eggs, culled birds and manure accounted for 87.33 per cent, 10.7 per cent and 1.97 per cent of the total income respectively.

Raiz and Chistie (2000) studied the economics of broiler farming in Kamrup district of Assam. They reported that a typical farm had to incur a cost of about ₹ 31 to produce one Kg of broiler and earn a net income of ₹ 7.31 from the same in a cycle of eight weeks. The income of the farmers increased with an increase in size groups. They also reported that both break even production and breakeven price were lower than the respective average production and average price received.

Boehlje and Ray (2000) studied the financial feasibility of contract v/s independent pork production in Washington and found out that the contract pig production yielded two folds as compared to independent farming both in production as well as profits.

Karim *et al*. (2001) made an attempt to analyse the performance of the broiler farms in Bangladesh under contract farming system in terms of profitability under constant rate of price. Seventy five farmers (25 small, 25 medium and 25 large farms) were purposively selected from the area. Costs and return were calculated to find out the profitability of broiler production. The total costs per bird were estimated at Tk. 78.43, Tk. 78.51, Tk. 78.32 and Tk. 78.31 for small, medium, large and all broiler farms respectively. On the return side, the average gross returns per bird per batch stood at Tk. 89.21, Tk. 89.40, Tk. 90.71 and Tk. 89.87 for small, medium, large and all broiler farms, respectively. The profit or net returns per bird for small, medium, large and all broiler farms were Tk. 10.80, Tk. 10.85, Tk. 12.40 and Tk. 11.75, respectively. Findings of the study clearly indicated that all broiler farms made good profit and the large farms, however, earned a little higher profit.

Rahman *et al.* (2003) studied the economics of dairy farming in six divisions of Bangladesh during 2000-01. Tabular analysis was carried out to work out cost and returns from milk. Annual rearing cost per animal accounted to 14,667.74 TK in group 1 (5-10 cows), 18,559.09 TK in group-2 (11-25 cows). The annual gross returns per farm per animal and net returns per milk cow were TK 18,899.77 and TK 25.99 respectively.

Shinde *et al.* (2003) studied the economics of goat rearing in Rajasthan. Cost of animal constituted 80.64 per cent and equipment 3.87 per cent of total investments in initiation of the goat rearing ventures. Total cost incurred in goat rearing was ₹ 1,425.95 and ₹ 683.45/goat/year. The income from sale of milk, surplus animals and manure constituted 50.64, 39.42 and 9.92 per cent of total receipts. The gross income obtained per goat per year was ₹ 911.30 and net income per goat per year was Rs. 277.85. The B:C ratio was found to be 1:1.34. It was concluded that goat rearing was reasonably remunerative providing ₹ 1.34 against every rupee invested.

Aslam and Khaushk (2004) analyzed the economics of buffalo dairy farms in Sindh district of Pakistan. They concluded that the total costs of dairy farms were estimated at ₹ 2,64,938, ₹ 10,94,658 and ₹ 27,91,760 for small, medium and large farms, respectively. The net return of selected dairy farms were analyzed and found that average net return were ₹ 67,134, ₹ 39,0482 and ₹ 13,46,580 per year respectively for small, medium and large farms.

Dwaipayan *et al.* (2005) studied the economics of buffalo milk production in Tarai area of Maharashtra which covers two blocks Udham Singh Nagar and Rudrapur block and five villages from each block which were selected randomly. It was revealed that returns occurred mainly from the sale of milk (97%) and sale of manure (3%). The total cost of milk production was more in the case of large farmers (>4 ha of land) i.e. ₹ 21,053.56/ha, followed by medium farmers (2 to 4 ha), small farmers (1 to 2), landless (having no land) and marginal farmers (<1 ha) who had incurred ₹ 20,849/ha, ₹ 19,773/ha, ₹ 19,047/ha and ₹ 17,071/ha respectively. The total returns obtained were more in large farmers (₹ 20,237/ha) followed by small farmers (₹ 19,513/ha), medium farmers (₹ 19,144/ha), marginal (₹ 17,225/ha) and landless (₹ 18,338/ha).

Jitender *et al.* (2005) studied the costs and returns from sheep and goat farming in Mahendergarh and Gurgaon districts of Haryana. Tabular analysis was used to study the status of

sheep and goat rearers and costs and returns from sheep and goat rearing. The annual average total cost per sheep farm was worked out to be ₹ 26,674, while on goat farm, it was ₹ 12,169. The average net returns from sheep and goat rearing were ₹ 4,983 and ₹ 16,605 respectively.

Gupta *et al.* (2005) studied economics of Angora rabbit rearing in Himachal Pradesh. He concluded that the cost of rearing per animal amounted to ₹ 448.654 and the gross (actual) annual income was ₹ 549.58 giving B:C ratio of 1.22.

Hossain *et al.* (2005) studied the dairy farming in Bangladesh. They concluded that the small scale dairy farming was financially feasible because the benefit cost ratio was 1:1.26.

Ganesh and Rai (2006) observed that the total costs involved in broiler poultry farm were ₹ 20,653, ₹ 59,261 and ₹ 94,612 for small (300 birds), medium (900 birds) and large (1500 birds) units respectively. Similarly the net returns obtained were ₹ 2,507, ₹ 10,279 and ₹ 21,188 in that order. They inferred that the profit increases as the size of the unit increases.

Ragavendra Naduvinmani (2007) studied the economics of red banana production under contract farming in Karnataka and found that the total cost of red banana production per hectare was ₹ 1,30,991 while the gross and net returns were ₹ 4,28,630 and ₹ 2,97,639 respectively. The benefit cost ratio for red banana was 3.28.

Zakir siraz (2008) studied the structure of contract farming in poultry industry and found that total cost incurred was ₹ 3.75 per bird. In the case of non contract, it was ₹ 5.83 per bird. The net return obtained per bird was ₹ 1.94 in the case of contract farmers and in the case of non contract farmers, it was ₹ 1.23. Similarly, the B-C ratio in the case of contract and non contract farmers were 1.52 and 1.02 respectively.

Mandeep Singh and Joshi (2008) conducted the economic analysis of dairy farming by marginal and small farmers in Punjab for the year 2003-04. It was found that a majority of the farm households were not able to meet their requirements from their income from crops. Further, dairy farming had emerged as a major allied enterprise for supplementing the income of marginal and small farmers in Punjab. Income from off-farm sources was identified as another important factor contributing significantly to the disposable income of the farm households. The study suggested to further exploit the potential of off-farm sources towards meeting the domestic expenditure.

Shivakumara (2008) conducted a study on production and marketing of vermicompost in Karnataka. To examine the financial feasibility in vermicompost production, NPV, BC ratio, IRR and PBP were worked out. The study revealed that the net present value was ₹ 99827, benefit cost ratio was 3.44, internal rate of return was 38 per cent and payback period was 1.71 years. This indicated the economic feasibility of vermicompost enterprise.

Sharma and Pandey (2008) studied the costs and net profits from Guava processing in Uttar Pradesh. The cost of processing guava into jam and jellies was estimated at ₹ 3,96,482 per year. The gross returns obtained from selling it worked out to ₹ 5,28,750 per year and the net returns obtained were ₹ 1,32,268 per annum. It was observed that the processing of guava was more profitable than selling it raw.

2.4 MARKETING ARRANGEMENTS FOR FARM PRODUCTS

Venkateshaiah (1992) while studying groundnut processing by different categories of traditional oil mills in Cuddapha district of Andhra Pradesh noticed three main channels. All the three channels were used for marketing oil while only last two were used for marketing of oil caters. The identified channels were

Channel-I: Producer – Wholesaler – Retailer – Consumer

Channel-II: Producer – Retailer – Consumer

Channel-III: Producer – Consumer

Chahal and Gill (1993) identified six channels of milk marketing in Punjab of which one channel was through milk plant and in other channels many intermediaries were operating. The authors concluded that producers share in consumer rupee depended upon length of channel, the number of intermediaries and the form in which finally product was sold to consumer. They reported that co-operative channel had highest share of producer in consumer rupee.

Maurya *et al.* (1995) indicated that in the marketing of anola products, highest per centage of consumer's rupee (62.25%) was the processing cost followed by the cost of kutch anola (15.58%), retailers margin (10.87%), manufacturers margin (8.67%) and charges paid by retailer (2.63%).

Shobha (1998) studied the performance of co-operative and private fruit and vegetable processing units at North Karnataka. She found that in the marketing of processed products, the following channels were involved:

Channel-I: Processor – Wholesaler – Retailers – Consumers

Channel-II: Processor – Retailer – Consumer

Channel-III: Processor – Consumer

Channel-IV: Processor – Wholesaler – Caterer

Channel-V: Processor – Caterer

The private sector unit was marketing the produce through the channels IV and V.

Baruah and Barman (2000) studied economic analysis of production and marketing of tomato in Barpeta district of Assam. The marketing cost, marketing margin, marketing efficiency, benefit- cost ratio and price spread involved in the production and marketing of tomatoes in Barpeta district of Assam were estimated based on data for 1997-98 collected from five primary wholesalers, seven secondary wholesalers and ten retailers. Net returns over costs showed direct relationship with farm size. Producers return was found to be highest when the farmers sold their produce through secondary wholesalers rather than through primary wholesalers.

Sawant *et al.* (2001) studied marketing of mushroom. The system of assembling and distribution of dried mushrooms consisted of mushroom growers, commission agents and consumers including hotels and big consumers. The commodity was disposed through two main channels namely:

Channel – I: Producer- Commission agent (farmgate) – Consumers

Channel – II: Producer- Commission agent (market) – Consumers

In channel –II, the producer directly sold mushroom to the commission agents near big city while in channel – I, the commission agent purchased mushroom from producer at their farm gate.

Pandey *et al.* (2003) estimated the price spread and producers' and market intermediaries' share in the consumer price in the channel: Producer – Commission agent – Retailer – Consumer in potato marketing at Shimla. For the study, a sample of 25 potato growers, 10 commission agents and 25 retailers was selected purposively. The result showed that the producer realized around 73 per cent share in consumer's rupee. The price spread and marketing efficiency was found to be about 27 and 3 per cent respectively.

Bhatia *et al.* (2004) studied marketing of sheep in Haryana and found various channels involved in the trade of live sheep and wool. For live sheep, the channel- IV, (Farmer-village middle men- local trader-wholesaler) was the most popular channel followed by channel III (Farmer-village middlemen-wholesaler). Moreover, small farmers had the highest sale through channel IV, followed by channel I (farmer to farmer). Medium farmers sold maximum through channel I followed by channel IV, and large farmers by channel III followed by channel I. Farmer-local trader-wholesaler channel had highest disposal of wool. But, small farmers had maximum sale through channel I (farmer-village middlemen-local trader-wholesaler), while medium and large farmers sold through channel II (farmer-local trader-wholesaler). For live sheep, the price received by the farmers through channel IV was the highest. Channel-II proved to be more efficient and the best channel in the study area for wool trade.

Bagde and Masane (2004) found the potential of goat meat marketing as profitable venture. The total receipts obtained by rearing herd of 16 animals amounted to ₹ 12679. They found two channels of live goat marketing. Channel I- (goat rearer to butcher) paid highest share to the goat rearers (99.08%) in consumer's rupee as against channel II (92.04%) involving middleman. The average live weight of goat was found to be 19.88 kg. For marketing of goat meat, 60 per cent carcass was obtained against live weight.

Shamsher singh and Chauhan (2004) studied on marketing of vegetables in Himachal Pradesh. A survey was conducted among 80 vegetable growers in Himachal Pradesh to study the channels, costs, margins and efficiency of vegetable marketing in the state. Results showed that most

of the vegetables were marketed through the channel involving wholesalers or commission agents and retailers. This led to an increase in wastage and marketing cost. Furthermore, due to the perishable nature of vegetables and the huge glut during the peak season, farmers did not get remunerative prices.

Talathi *et al.* (2005) conducted a study on economics of marketing of sapota in Kaskan region of Maharastra state and reported the following four channels.

i) Producers – Fruit merchants – Commission agents – Retailers – Consumers.

ii) Producers – Fruit merchants – Commission Agents – Retailers – Consumers.

iii) Producers – Commission Agents – Retailers – Consumers.

iv) Producers– Co-operative Society – Commission agents – Retailers – Consumers.

v) Producers – Fruit merchants – Hawkers – Consumers.

The producers share in consumer's rupee was found to be highest (34.40 %) in channel – II and lowest (28.39 %) in channel – I.

Thripathi *et al.* (2006) studied price spread and marketing efficiency in the marketing of ginger through different marketing channels in Meghalaya. They found four channels.

Channel – I: Producer – Village trader/ Commission agent at local market – Wholesaler – Retailer – Consumer.

Channel – II: Producer – Commission agent at local market – Wholesaler – Retailer – Consumer.

Channel – III: Producer – Commission agent – Retailer – Consumer.

Channel – IV: Producer – Small trader – Commission agent – Retailer – Consumer.

Gauraha *et al.,* (2007) studied marketing of soybean in Sehore district of Madhya Pradesh. Data were obtained from 120 soybean farmers as well as from market intermediaries and processors to examine the marketing patterns, costs and margins for soybeans in Sehore district. Three channels for marketing soybeans to processors were identified (1) through village merchants and wholesale dealers (2) through co-operative societies, and (3) through wholesale dealers in regulated markets. Total marketing cost was highest on channel-I (₹ 202.52) and lowest on channel – II (₹ 160.40). The producers share in the consumer price was almost similar in channel II and III.

Hatai (2007) studied economics of production and marketing strategies of potato in Orissa. Stratified random sampling techniques were employed to select the sample. Total 90 potato growers were selected on the basis of different cost concept. The cost of cultivation had been estimated. The net returns over different cost concepts have been estimated.

Naphade and Tingre (2008) conducted a study in Buldhana district of Maharastra to find out the price spread in guava marketing observing three marketing channels.

i) Producer – Wholesaler – Retailer – Consumer.

ii) Producer – Retailer – Consumer

iii) Producer – Consumer

The result of the study observed that the price spread was ₹ 170 in channel – I, ₹ 113 in channel – II and ₹ 70 in channel – III. Marketing of guava was mostly done via channel – I.

Shalender *et al*. (2009) found goat marketing channel (I) (farmer – butcher/ retailer-consumer), where farmer had 72% share in the consumers' price. In channel (II) (farmer- petty trader-butcher/retailer – consumer), farmers had 65% share in the consumers' price. They also found that basis of price fixation was body weight by the butchers (90%). The paper reported that almost all butchers purchased slaughter goats on weekly basis. In price and composition of purchase of goat by butchers, they had purchased 41 per cent adult males and rest others females and kids. He found that farmers most preferred time of sale of their goats was winter as the demand as well the price of meat goat remained high in winter. The second preference for time of sale was summer followed by rainy season. The availability fodder was the major factor in deciding the time of sale.

Anchal and Sharma (2009) conducted a study in the sub- mountainous region of Gurdaspur district of Punjab to know the price spread of litchi observing the following three marketing channels.

i) Producer – Pre-harvest contractor – Retailer – Consumer (local market)

ii) Producer – Pre-harvest contractor – Retailer (through commission agent) – Consumer (Amritsar market)

iii) Producer – Pre-harvest contractor (wholesaler) – Retailer (through commission agent) – Consumer (Delhi market).

Of the three channels, the first one was found to be the most efficient as the producer could get as high as 72.08 per cent of the consumer's rupee. The price spread was ₹ 540.98 for local market, ₹ 1,126.02 for Amritsar market and ₹ 1664.19 for Delhi market.

Kerutagi (2009) conducted a study on sapota marketing in Belgaum and Dharwad district of Northern Karnataka. He identified the following channels of sapota marketing.

i) Producer – Commission agent – Retailers – consumers

ii) Producer – Pre-harvest contractor cum wholesaler – Retailers – Consumers

The producer's share in consumer's rupee in channel – I was higher (59.58%) than in the channel – II (48.14%). Similarly, price spread in channel – I (₹ 2500, 26.32%) was less than the channel – II (₹ 4,000, 42.11%) indicating higher efficiency of channel – I.

Kumar and Singh (2010) estimated the price spread of Mango in the following four marketing channels in Lucknow district of U. P.

i) Producer (local) – Pre-harvesting contractor (local) – Commission agent (lucknow) – Wholesaler (New Delhi) – Retailer (New Delhi) – Consumer (New Delhi)

ii) Producer (local) – Pre-harvesting contractor (local) – Commission agent (Lucknow) – Retailer (Lucknow) – Consumer (Lucknow)

iii) Producer (local) – Pre-harvesting contractor (local) – Wholesaler (Lucknow) – Retailer (Lucknow) – Consumer (Lucknow)

iv) Producer (local) – Pre-harvesting contractor (local) –Retailer (Lucknow) – Consumer (Lucknow)

Among the four channels, channel – IV was the most efficient one from the points of view of producer as well as consumer as the producers got as high as 46.09 per cent of the consumer's rupee and remaining 54 per cent was incurred on different marketing costs or the margin by the pre-harvest contractor/ retailer. The per centage share of the total marketing margin in consumer's rupee was the highest in channel IV (34.06%) followed by channel III (32.79%), channel II (30.06), and channel I (28.32). Thus the price spread was found to be minimum in local markets and maximum in distant markets.

2.5 PROBLEMS ASSOCIATED WITH LIVESTOCK ENTERPRISE

Belli (1990) studied the problems encountered in dairying by Gavali community in Dharwad taluk. He revealed that all the respondents expressed the problem of depleted grazing lands and fodder problems; 91.67 per cent of them complained about water scarcity. A majority of the respondents complained about inadequacy of market infrastructure for the marketing of milk and milk products. The remedies suggested by them were allotment of more land for growing fodder by the forest department, providing water facilities by digging open wells, tube wells or by constructing small tanks for their animals, better milk price and establishment of veterinary hospitals near their settlements.

Venkateshaiah (1992) in his study on groundnut processing units in Andhra Pradesh identified stiff competition among the processors for getting the required raw material. Frequent power shedding, high taxation, low product recovery and non-adoption of efficient technology at an affordable costs were the major problems associated with the groundnut processing.

Rajendran and Prabaharan (1993) undertook a study in Tamil Nadu to know the problems in management of milch animals. They concluded that the problems faced by the farmers were high investment costs, frequent illness of buffaloes, high feed requirement and high veterinary treatment costs.

Prabaharan and Thirunavakkarasu (1994) studied the constraints in goat farming in seven agro-climatic zones of Tamil Nadu. They found inadequate fodder and grazing lands. Exploitation by middlemen was the major constraint of goat farming.

Mangala (1995) while studying the strategies for effective management of sugar factories in India found lack of quality raw material, efficient technology and professionally trained management personnel at different levels of organizational structure as the main problems. She also pointed to the firm's external problems such as governments pricing policies.

Eswara and Radha (1996) in their survey on analysis of the constraints in sheep marketing and their products in Karimnagar district of Andhra Pradesh concluded that about 60 per cent of the respondents felt marketing place as their main problem. They also found that about 75 per cent of the respondents had the problem of technical know-how and lack of information about marketing functionaries.

Rachhpal and Darshan (1996) in their study on performance of agro-processing units in Punjab revealed that failure of these units on the market front in terms of brand was the major problem. Further, he opined that any such failure ultimately puts a question mark on the very survival of the industry or unit under consideration.

Brahmaprakash and Dinesh (1997) in their study on infrastructural requirements for establishment, development and operation of agro-processing industries in rural areas opined that lack of market information system, timely and adequate financial support and post-harvest technology were the major problems to realize the rural projects in India.

Roy (1997) opined that lower capacity utilization of the agro-based industries was reasoned by lack of infrastructural facilities such as transportation, storage and technology for post-harvest handling. He also opined that the lack of integrated network between the producer, farmer and the processor was an indirect problem of agro-based industries.

Ramandev (1998) in his study on business performance analysis and appraisal of the cashew nut processing units in Uttar Kannada district of Karnataka identified that high taxation, short supply of raw materials, unfavourable government policies and marketing system were major problems as conceived by the industry.

Shobha (1998) studied performance of private and co-operative processing units of fruit and vegetable processing units in North Karnataka. The problems in the co-operative sector processing units were inadequate availability of raw material in terms of quality and quantity; lack of power supply; lack of modernization of machinery; inadequate transport facility and high flight charges.

The study undertaken by Sani *et al.* (2000) regarding the economics of poultry production in Bachi state of Nigeria concluded that the major constraints associated with poultry enterprise were high cost of feed and the prevalence of diseases.

A study by Vyas and Patel (2000) on constraints faced by milk producers in adoption of dairy technology revealed that non-availability of loan facilities for purchase of milch animals and fodder, non-availability of marketing facilities, lack of knowledge of scientific animal feeding were the main constraints in adoption of dairy technology.

Aslam and Khaushk (2004) conducted the economic analysis of buffalo dairy farms in Pakistan. They observed that there were a number of technical and socio-economic problems which limit the productivity of dairy farms such as shortage of feed, high mortality, poor genetic potential, high input cost and inadequate marketing facilities.

Hossain *et al.* (2005) studied the problems associated with small scale dairying in Bangladesh. The problems identified were scarcity of feed and fodder, high price of concentrate and lack of technical knowledge.

Senthil and Meganathan (2005) in their study on marketing of sheep/mutton observed that among various problems, sheep farmers ranked non-availability of required food as their major problem followed by poor credit facility and unremunerative price and lack of capital for their investment.

Mahendra and Anil (2006) studied the constraints faced by dairy farms in Rajasthan. The main constraints observed by them were high cost of feeds and fodder, poor availability of fodder and feed, limited financial resources, lack of facilities for treatment, vaccine and medicines, lack of

veterinary dispensaries and poor knowledge of scientific management and animal health care practices.

Singh *et al.* (2006) studied the socio-economic conditions of sheep and goat owners and the constraints of rearing in Himachal Pradesh. The major problem was poor veterinary facility in the study area. They also reported that low price for live animal and wool, transportation problems, wild animal attack, higher mortality rate (15-25%) were their major problems.

Suhag *et al.* (2007) studied the periodicity of cattle fairs, cattle transactions, organizational structure of cattle fairs and problems therein at Hisar circle fair. They found that 95 per cent of the animals transacted in cattle fairs included bullock, calves and camel; trading of buffaloes was only one per cent. Both buyers and sellers encountered several problems, and market intelligence service was absent in cattle market fairs, but horizontal integration was observed.

Gnankumar (2007) studied the financial feasibility of investment in contract poultry farming in Coimbatore district of Tamil Nadu. The study found out the problems of poultry farmers that compelled them to enter into a contract. Poor income from traditional agriculture, water scarcity, high market risk, labour crunch, and need for more substantial working capital were the primary reasons that were evolved from the study.

Raghuvendra (2007) studied the problems experienced by retailers in meat marketing. He revealed that 80 per cent chicken, mutton and beef retailers faced problems of high price. Other problems were fear of disease in meat in chicken (70%), competition from other retailers (40 %) and lack of meat availability (30%).

Mundad (2011) studied the problems faced by the FCIGs in organizing, pooling and marketing of the commodities indicating socioeconomic status of the farmer was a major problem in organizing. When it came to pooling of commodities, majority of the FCIGs encountered the high cost of transportation as the major problem, followed by scarcity of labours during peak period. Regarding marketing problems, proximity to market and high cost of transportation were the major ones as expressed by the respondents.

METHODOLOGY

This chapter is intended to present the demographic features of the study area, nature and source of data collected, analytical tools and techniques employed to evaluate the objectives of the present study.

The chapter is presented under the following headings.

3.1 Description of the study area

3.2 Sampling design

3.3 Nature and sources of data

3.4 Analytical tools and techniques employed

3.5 Concepts used in the study

3.1 Description of the study area

The present study was undertaken in Dharwad district of Karnataka state. Karnataka is the eighth largest state in India with an area of 190 lakh hectares. It is situated between 11˚5' and 18˚45' North latitude and between 74˚ and 78˚ East longitude in the southern plateau. The state receives the average rainfall of about 1139 mm both from south-west and north-east monsoons. The temperature ranges from 14˚C to 40˚C. The important crops grown in the state are jowar, paddy, ragi, maize and wheat, among cereals; red gram, bengal gram, green gram, among pulses; groundnut, sunflower and safflower, among oilseeds crops; cotton, chilli, sugarcane and tobacco, among commercial crops; and mango, sapota and banana among fruit crops, and coconut, arecanut and coffee among plantations.

Karnataka comprises 30 districts of which 13 districts are located in northern part of the state and rest in the southern part of state. Dharwad district was chosen for study purposively as Dharwad district is the major Emu farming district in North Karnataka. The Map of the study area is presented in Fig 2.

3.1.1 Location

Dharwad district is situated in Northern part of Karnataka (Figure 1). It lies between 15˚02' to 15˚05' North latitude and between 73˚43' to 75˚20' East longitudes. The district is bound by Belgaum, Haveri, Gadag and Uttar Kannada districts in North, South, East and West respectively. The district is divided into three belts geographically as Malanad, Transition and Dry regions. Dharwad district comprises of 14 hobilies. Among these, 4 hobilies are included in Dharwad taluk, 3 in Kalaghatagi, 3 in Hubli and 2 hoblies each in Kundagol and Navalgund taluks.

3.1.2 Geographic and demographic features of Dharwad district

Dharwad district is situated in the Western sector of the northern half of Karnataka State. The District encompasses an area of 4263 km^2. The district is bounded on the North by the District of Belgaum, on the East by the district of Gadag, on the South Haveri and on the West by Uttara Kannada district. All these districts which surround Dharwad district belong to Karnataka State itself.

Fig 1: Map of Karnataka state Showing Dharwad district

Fig 1. Map of Karnataka state Showing Dharwad district

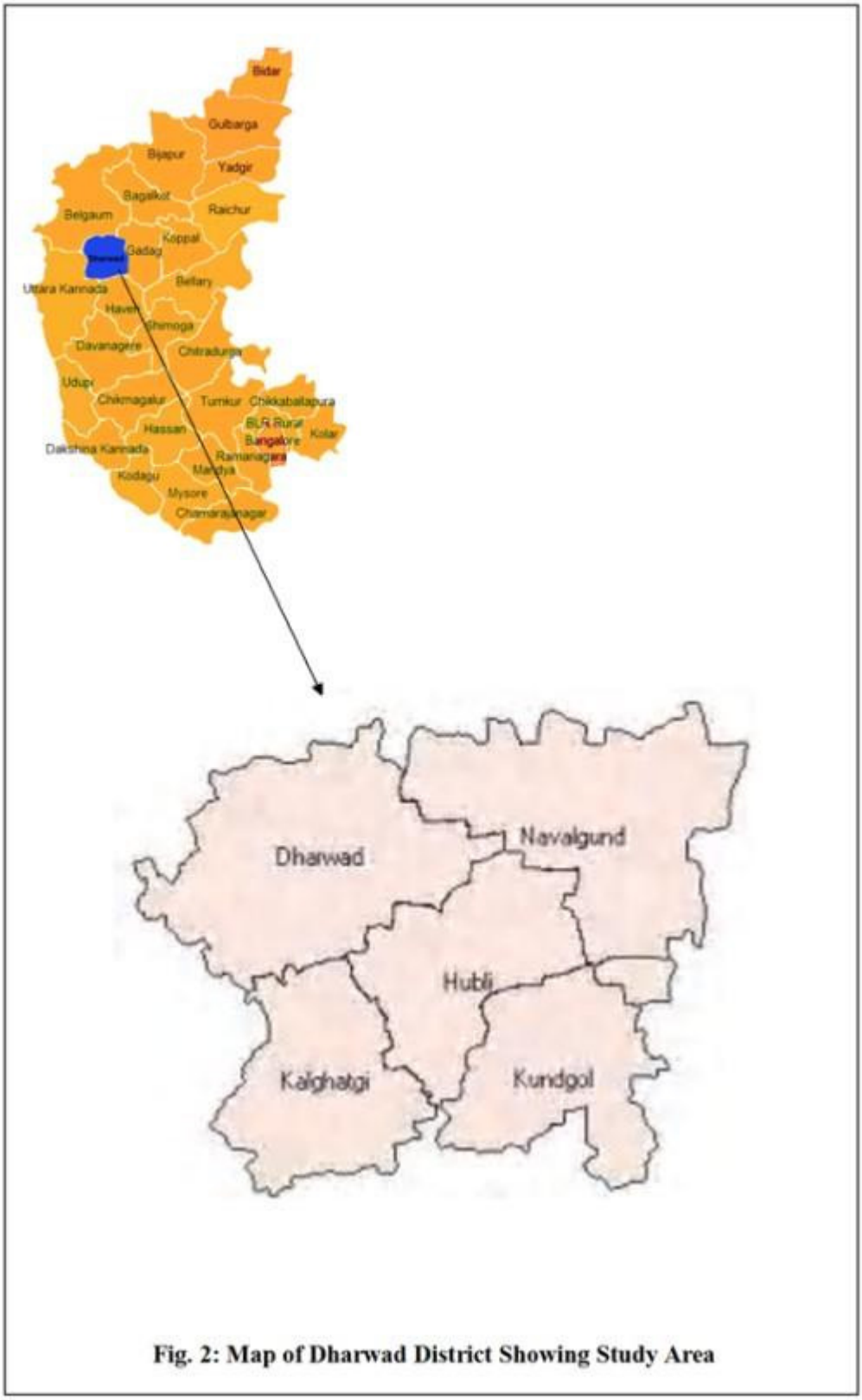

Fig. 2: Map of Dharwad District Showing Study Area

Fig 2. Map of Dharwad District Showing Study Area

Geographical location	15˚ 02' and 15˚ 51' North latitude 73˚ 43' and 75˚ 35' East longitude
Temperature	40^{o} C (Max) 12^{o} C (Min)
Average Rainfall	772 mm
Rivers	Bennihalla (Krishna basin), Bedthi and Shalmala
Area	4,263 km^2
District headquarter	Dharwad
Population	1,846,993
Population density	434 /km^2
Sex ratio	967 per 1000 male
Literacy rate	80.3 %
Nearest Airport	Hubli Airport
Industrial areas	Seven Industrial Areas, two Industrial Estates and a proposed SEZ
Hospitals	Dharwad has 30 primary health centers along with 156 privately operated hospitals. Dispensaries and drug shops are also available in plenty in the district. The district has been a centre for various healthcare initiatives at Government level like Tuberculosis control programme, polio immunization programme, etc.
Education	Dharwad has 1077 primary schools, 304 High schools and 97 Pre-university colleges. In higher education segment, the district has 98 general (arts, science and commerce) colleges, two medical colleges, three engineering colleges, one dental college and nine polytechnics. The district represents a higher interest in education with 132 libraries.

3.2 SAMPLING DESIGN

Through interaction with the operators of Emu rearing units and experts in livestock industry, it was found that there are totally 13 Emu farming units in Dharwad district. The present study considered 12 units for analysis. However, since the number of birds varied widely across these 12 units, they (units) were classified into small and commercial units. For the purpose of classification, Emu units with more than 25 pairs of birds were considered as the commercial units and those with 25 pairs or less were considered as small units. Based on this criterian 10 out of the selected 12 units turned out to be small units, while the remaining two were identified as the commercial units. The details of the Emu units considered in this study are given in table 3.2.1

3.2.1 Details of Emu units selected for the study

Units		Address
I	Commercial units	
a)	Gokul Emu farm	Jayachandra T. Gituri Gokul road hubli Dist: Dharwad Tq: Hubli Mob no: 9164529141
b)	Vinni's Indo Aussi Emu farm	Vinay . T Sulla Dist: Dharwad Tq: Hubli Mob no:9663248627
II	Small units	John .K

Units		Address
a)	John Emu farm	Navanagar Dist: Dharwad Tq: Dharwad Mob no :9980248437
b)	Juber Emu farm	Juber yargoppa Tarihal Dist: Dharwad Tq: Hubli
c)	Jadav Emu farm	P. Jadav Amargol Dist: Dharwad Tq: Dharwad
d)	Basavaraj Emu farm	Basavarajppa parekar Varur Dist: Dharwad Tq: Hubli Mob no: 9743436227
e)	Pale Emu farm	Satif.A. shek Pale Dist: Dharwad Tq: Hubli
f)	Abdul Emu farm	Abdul sadik Kalaghatagi Dist: Dharwad Tq: Kalaghatagi
g)	Ramesh Emu farm	Ramesh jadav Varur Dist: Dharwad Tq: Hubli
h)	Babu Emu farm	Babu dasar Linganhalli Dist: Dharwad Tq: Hubli
i)	Mohamad Emu farm	Mohamad shek Sulla Dist: Dharwad Tq: Hubli

3.3 Nature and sources of data

The present study relied on primary data collected from Emu farm operators. The data pertaining to their socio-economic status, cost of production, returns, marketing arrangements, awareness about Emu birds and problems faced in production and marketing of emu birds were collected from Emu farmers through personal interview method using pre-tested schedule.

3.4 Analytical tools and techniques employed:

Tabular analysis

Tabular analysis was used to interpret the results obtained from the investigation. The investment pattern, socio-economic characteristics of Emu farmers, marketing arrangements, problems faced by Emu rearers were subjected to tabular analysis through the tools like averages and percentages to obtain meaningful inferences.

Financial analysis

The financial feasibility of Emu units was analyzed using the techniques such as:

(i) Net Present Value/worth (NPV)

(ii) Benefit-Cost Ratio (B: C Ratio)

(iii) Internal Rate of Return (IRR) and

(iv) Pay Back Period (PBP)

Assumptions made for financial feasibility analysis :

a) Both small and large units of Emu farming were assumed to start business with two year old Emu birds, which is a common practice in the study area.

b) Two year old Emu birds cost ₹ 30,000 per pair

c) The life of the project was assumed to be 15 years. Since Emu farming is a relatively recent development, the operators of the two large units felt that it would be difficult to foresee what would happen to the business after 15 years. Also after 15 years of laying eggs, the birds' productivity declines. As such, they expressed that they would continue the business for 15 years at the most. Thus this study assumed 15 years as the life of the project.

d) The present price of an egg is assumed to be ₹ 1500, which is expected to grow at five per cent per annum. Similarly, the price of a chick assumed to be ₹ 2500 in the beginning is expected to grow at five per cent. (These assumptions based on past trend)

e) Emu feed cost, veterinary charges, labour charges, electricity charges and maintenance cost are assumed to grow at five per cent, six per cent, four per cent, seven per cent and five per cent respectively, based on the past trend.

f) A discount rate of 11 per cent is used for the feasibility analysis.

g) Emu bird lays ten eggs during the first year of laying, 20 eggs during the second year and 30 eggs thereafter.

h) In the case of large farms, egg hatchability is 65 per cent during the first year of laying, 75 per cent during the second year of laying and 85 per cent thereafter.

i) Small farms sell all eggs without any retention for hatching.

j) Depreciation: Depreciation was calculated by using straight line method for shelter shed and written down value method for buildings like office room, hatchery room and feed store room.

k) Depreciation on birds: The life span of birds is 35 years and will be disposed at the age of 17 years (when the project is assumed to be closed). At this time, the birds body weight will be increased resulting in much increased meat yield. As such, it can be well assumed that the sale price of the bird while winding up the project after 15 years will be at least as much as the purchase price For this reason, the present study assumes zero depreciation on the value of Emu birds.

l) Age of birds at the time of purchase: Two years

m) Incubation period: 52 days

n) Feed cost: Feed cost considered for 313 days (@ ₹ 15/kg) because in a year Emu bird sit 52 days for incubation during this period it will not eat food.

3.4.1 Net Present Value (NPV)

This indicates the present value of expected or realized net cash flows or returns of the project over its life time when discounted at the opportunity cost of capital. The opportunity cost of capital considered in this study was 11 per cent per annum.

The NPV was worked out as follows:

$$NPV = \sum_{t=1}^{n} \frac{Yt}{(1+r)^t} - I$$

Y= net returns in period t

t = 1…….n

r = discount rate

I= Initial investment

3.4.2 Benefit cost ratio (B-C ratio)

The benefit cost ratio was worked out by discounting the net returns during the life period of the Emu farming unit at a discount rate of 11 per cent per annum.

The formula used was:

$$\text{B-C ratio} = \frac{\text{Discounted net return}}{\text{Initial investment}}$$

3.4.3 Internal rate of return (IRR)

IRR is the discount rate which makes the net present value of the project equal to zero. However, IRR needs to be found through trial and error method. For this purpose we need to use two different discount rates such that the NPV at one discount rate (called lower discount rate) is positive and the NPV at the other discount rate (called the higher discount rate) is negative. Then IRR is calculated using the following formula.

$$\text{IRR} = \text{Lower discount rate} + \frac{\text{NPV at lower discount rate}}{\text{Sum of the two NPVs Ignoring the negative sign}} \times \text{(difference between two discount rates)}$$

The project is considered to be feasible if the IRR is higher than the opportunity cost of capital.

3.4.4 Payback period (PBP)

It indicates the number of years required to recover the initial investment made in Emu units. The method followed is to successively add the net returns from each production year until the investments are completely recovered.

3.5 TERMS AND CONCEPTS USED

Fixed capital: The items included under fixed capital are land, buildings, incubator, equipments and cost of birds.

Working capital: The working capital include feed for birds, medicine and veterinary charges, labour charges, electricity charges, packing charges and interest on working capital.

Interest on working capital: Interest on working capital was calculated at 11 per cent on total working capital.

Interest on fixed capital: Interest on fixed capital was calculated at 9 per cent on total fixed capital.

RESULTS

The results of the study are presented under the following heads.

4.1 Socio-economic conditions of farmers engaged in Emu farming

4.2 Investment pattern for Emu farms

4.3 Business performance of Emu farms

4.4 Marketing arrangements for Emu farming products

4.5 Problems encountered in production and marketing of Emu products

4.1 Socio-economic conditions of farmers engaged in Emu farming

Table 4.1 presents socio-economic characteristics of Emu rearers. These characteristics pertained to average age of the head of the family, educational level, family size, main occupation, subsidiary occupation and annual income. As can be seen from the table, average age of the head of the family was 52 years in respect of large Emu farm and 54 years in the case of small farms. The head of the family was less than 35 years old in the case of one large farm and more than 50 years in the case of the other. With regard to small farmers, a majority of the farmer (50 per cent) were in the age group of 35-50 years followed by the age group of less than 35 years (40 per cent) and the age group of more than 50 years (10 per cent). With regard to education level, it can be seen that one of the two large Emu rearers had secondary education and the other had college education. In the case of small rearers, as many as five rearers (50 per cent) had college education. Of the remaining five small rearers, three had secondary education, one had primary education and one was illiterate.

With regard to family size, one large farmer had family with less than four members, while the other one had medium sized family. A majority of small rearers (70 per cent) had medium family with 4-8 members, while 20 per cent had small families of less than four members. Only one small rearer had a large family of more than eight members. It was revealed by all small and large Emu farmers that Emu farming itself was their major occupation. However, both the large Emu rearers had some subsidiary occupation in other agriculture and allied activities as well as non agriculture sector. Similarly, all the ten small rearers had subsidiary occupation in other agriculture and allied fields. Further, six small rearers had subsidiary occupations in non agricultural sector also.

For the purpose of documenting the annual income of Emu rearers, three categories of income were formed such as category of less than ₹ 5 lakhs, ₹ 5-10 lakhs and more than ₹ 10 lakhs per annum to accommodate both categories of farmers. It can be seen from the table that both the large rearers had income of more than ₹ 10 lakhs. In the case of small rearers, two had annual income less than ₹ 5 lakhs and remaining eight had income in the range of ₹ 5-10 lakhs.

4.2 Investment pattern for Emu farms

4.2.1 Investment pattern for large scale Emu farm with herd size of 300 pairs of birds

In the present study, investment pattern for the establishment of Emu farming unit was analysed both for large and small farms. Table 4.2 depicts investment pattern for the large farm with 300 pairs of birds. It can be seen that the total establishment cost (including the cost of birds) for starting an Emu farm with 300 pairs of birds would amount to ₹ 97,87,800. As the table shows, the major chunk of this investment expenditure would be on account of cost of birds. At the prevailing price of ₹ 30,000 per pair, a sum of ₹ 90,00,000 would be needed for buying birds, which would account for around 92 per cent of the total investment expenditure. The second major item of investment would be fencing. At the rate of ₹ 5 per square foot, the fencing and entrance gate expenditure would account for 2.23 per cent of the total investment. The incubator and digging of bore well (along with accessories) would each cost ₹ 1,00,000, each accounting for 1.02 per cent of investment expenditure. The shelter shed would occupy the fourth place in the order of the extent of expenditure with an outlay of ₹ 96,000. Hatchery room, requiring an outlay of ₹ 81,000 would account for 0.83 per cent of the total expenditure the other items of investment requiring small expenditure include office room, feed store room, vegetable cutting machine, furnishing etc.

Table 4.1 Socio economic characteristics of Emu rearers

S No.	Characters	Unit	Large Rearers (n=2)	Small Rearers (n=10)	Overall
1	Average age of head of the family	Yrs	52	54	53.66
	Age group of <35 years	No's	1 (50.00)	4 (40.00)	5 (41.66)
	Age group of 35-50 years	No's	0 (0)	5 (50.00)	5 (41.66)
	Age group of >50 years	No's	1 (50.00)	1 (10.00)	2 (16.66)
2	Educational level				
	Illiterates	No's	0 (0)	1 (10.00)	1 (8.33)
	Primary Education	No's	0 (0)	1 (10.00)	1 (8.33)
	Secondary Education	No's	1 (50.00)	3 (30.00)	4 (33.33)
	College Education	No's	1 (50.00)	5 (50.00)	6 (50.00)
3	Family size				
	Small (< 4 members)	No's	1 (50.00)	2 (20.00)	3 (25.00)
	Medium (4-8 members)	No's	1 (50.00)	7 (70.00)	8 (66.66)
	Large (> 8 members)	No's	0 (0)	1 (10.00)	1 (08.33)
4	Main occupation				
	Emu farming	No's	2 (100)	10 (100)	12 (100)
	Other agriculture and allied activities	No's	0 (0)	0 (0)	0 (0)
	Non agriculture		0 (0)	0 (0)	0 (0)
5	Subsidiary occupation				
	Other agriculture and allied activities	No's	2 (100)	10 (100)	12 (100)
	Non agriculture	No's	2 (100)	6 (60.00)	8 (66.66)
6	Annual income				
	Low (<₹ 5 lakhs/ annum)	No's	0 (0)	2 (20.00)	2 (16.66)
	Medium (₹ 5-10 lakhs/ annum)	No's	0 (0)	8 (80.00)	8 (66.66)
	High (>₹ 10 lakhs/ annum)	No's	2 (100)	0 (0)	2 (16.66)

Table 4.2 Investment pattern for large scale Emu farm with herd size of 300 pairs of Birds

S. No	Particulars	Area/Number	Value (₹)
1	Fencing @ ₹ 5 /sq.foot and entrance gate	43560 sq.foot	2,17,800 (2.23)
2	Shelter shed (40'x 60') @ ₹ 40/sq foot	2400 sq. foot	96,000 (0.98)
3	Office room (12'X 12') @ ₹ 400 /sq.foot	144 sq.foot	57,600 (0.59)
4	Furnishing	1	20,000 (0.20)
5	Cost of birds @ ₹ 30000/pair	300	90,00,000 (91.95)
6	Hatchery room 18'x18' @ ₹ 250/sq foot	324 sq.foot	81,000 (0.83)
7	Incubator	1	1,00,000 (1.02)
8	A bore well with pump set and electric connection	1	1,00,000 (1.02)
9	Feed store room (12'X 12') @ ₹ 400/ sq foot	144 sq. foot	57,600 (0.59)
10	Equipments		
	Tub @ ₹ 300/tub	50	15,000 (0.15)
	Barrel @ ₹ 600/Barrel	20	12,000 (0.12)
	Vegetable cutting machine	1	30,000 (0.31)
	Water can @ ₹ 200/water can	4	800 (0.01)
	Total		97,87,800

*Numbers in brackets are percentages to the total

4.2.2 Investment pattern for small scale Emu farm with herd size of 25 pairs of birds

The investment pattern for small scale Emu farm with a herd size of 25 pairs of birds is presented in table 4.3. It is evident from the table that the total investment outlay for the starting of small Emu farm would be ₹ 9,41,000, which would also include the cost of birds. As in the case of large farm, here also cost of birds is the major item of investment accounting for 79.70 per cent (₹ 7,50,000) of the investment expenditure at the rate of ₹ 30,000 per pair of birds. The next major component of investment would be fencing which requires ₹ 65340 accounting for around 7 per cent of total investment. The third in the order of magnitude of expenditure would be store room requiring 5.36 per cent of the total investment outlay. Bore well with accessories and shelter shed would be in the fourth and fifth place accounting for 4.25 per cent and 2.55 per cent of the total investment expenditure respectively. The other items of investment in the decreasing order of magnitude are furnishing (0.53 per cent), tub (0.32 per cent) and water can (0.04 per cent).

4.3 Business performance of Emu farms

4.3.1 Costs and returns in large scale Emu farm

The cost and returns structures of the large scale Emu farm with 300 pairs of birds is presented in table 4.4. The variable costs include feed for birds, medicine, and veterinary charges, labour charges, electricity charges, packing charges, and interest on working capital. It can be seen from the table that the total variable cost per annum for the farm was ₹ 35,37,570. Feed for the birds at the rate of ₹ 15 per bird per day accounted for the maximum proportion (₹ 28,17,000) of the total variable cost. The other major items of variable cost were interest on working capital at 11 per cent which amounted to ₹ 3,50,570, labour charges to the tune of ₹ 1,92,000 and medicine and veterinary charges to the extent of ₹ 1,44,000.

The items included under the fixed cost were interest on fixed capital, depreciation on building, depreciation on incubator, rental value, and land revenue. Interest on fixed capital at the rate of 9 per cent ₹ 7,32,236; depreciation on building at the rate of 5 per cent ₹ 12,638; depreciation on incubator was ₹ 8100 and rental value was ₹ 15000. The total fixed cost was ₹ 7,67,982. As such, the total cost per annum for the large Emu farm was ₹ 43,05,552.

Returns from the Emu farming in respect of the selected large farms in the study consisted revenue from the sale of eggs, chicks and manure. At the rate of 30 eggs per annum per bird, the flock of 300 pairs of birds gives 9000 eggs. The large farms sell 80 per cent of these eggs, which amounts to 7200 eggs. With each egg fetching ₹ 1500, the total revenue from the sale of eggs is ₹ 1,08,00,000. The remaining 20 per cent of the eggs are used for hatching. The normal hatching per centage of eggs when the birds attain the age of five years is 85 per cent. As such, only 1530 eggs will hatch. At the price of ₹ 2500 per chick, the income from the sale of chicks amounts to ₹ 38,25,500. In addition, the large farms also get an income of ₹ 64,000 from the sale of 160 bags of manure with each bag fetching a price of ₹ 400. Thus, the total returns obtained by the large farm from eggs, chicks and manure amounted to ₹ 1,46,89,000. The net returns were ₹ 1,03,83,448.

4.3.2 Costs and returns in small scale Emu farm

The cost and return structure in small scale Emu farming with 25 pairs of five year old birds is presented in table 4.5. The components of variable cost included feed for birds, medicine and veterinary expenditure, labour charges, electricity charges, interest on working capital and miscellaneous expenditure. Feed cost had the largest share in the total variable cost at ₹ 2,34,750 followed by labour charges (₹ 48000), interest on working capital at 11 per cent (₹ 33,589), medicine and veterinary expenditure (12,000), electricity charges (₹ 9600) and miscellaneous expenditure of ₹ 1000. The total variable cost incurred by a small Emu farm of 25 pairs of birds was to the tune of ₹ 3,38,939 per annum.

The total fixed cost which was of the order of ₹ 81,730 mainly consisted of interest on fixed capital (₹ 73,452). The other items of fixed cost included rental value of land (₹ 6000) and depreciation ₹ 2274. The total cost, therefore, amounted to ₹ 4,20,669.

The returns from small scale farming consisted of income from the sale of eggs and manure only as these farms did not engage in rearing of chicks. The return from the sale of 750 eggs at the

Table 4.3 Investment pattern for small scale Emu farm with herd size of 25 pairs of birds

S. No	Particulars	Area/number	Value (₹)
1	Fencing @ ₹ 3 /sq feet	21780 Sq foot	65,340 (6.94)
2	Shelter shed (20'x40') @ ₹ 30 sq.foot	800 Sq. foot	24,000 (2.55)
3	Store room(12'x12') @ ₹ 350/sq foot	144 sq foot	50,400 (5.36)
4	Furnishing	1	5,000 (0.53)
5	Cost of birds @ ₹ 30000/pair	25 pairs	7,50,000 (79.69)
6	Bore well with accessories	1	40,000 (4.25)
7	Equipments		
	Tub @ ₹ 300/tub	10	3,000 (0.32)
	Barrel @ ₹ 600/barrel	5	3,000 (0.32)
	water can ₹ Rs 200/can	2	400 (0.04)
	Total		9,41,140

* Numbers in brackets are percentages to the total

Table 4.4 Costs and returns in large scale Emu farm with 300 pairs of birds

S. No	Particulars	Value (₹)
1	Variable cost	
	I) Feed for birds @ ₹ 15/kg /bird/day	28,17,000
	II) Medicine and veterinary charges @ ₹ 20/month/bird	1,44,000
	III) Labour @ ₹ 4000/month/man	1,92,000
	IV) Electricity @ ₹ 2000/month	24,000
	V) Packing charges	10,000
	VI) Interest on working capital (11%)	3,50,570
	Total variable cost (A)	35,37,570
2	Fixed costs	
	I) Interest on fixed capital (9%)	7,32,236
	II) Depreciation on Buildings (5%)	12,638
	III) Depreciation on incubator (10%)	8,100
	IV) Rental value	15,000
	V) Revenue	8
	Total fixed cost (B)	7,67,982
3	Total cost (A+B)	43,05,552
4	Returns	
	I) Return from sale of 7200 eggs @ ₹1500 /egg	1,08,00,000
	II) Return from sale of 1530 chicks @ ₹ 2500/chick	38,25,000
	III)Return from sale of 160 bags of manure @ ₹ 400/bag	64,000
	Total returns	1,46,89,000
5	Net returns	1,03,83,448

Table 4.5 Costs and returns in small scale Emu farm with 25 pairs of birds

S. No	Particulars	Value (₹)
1	Variable cost	
	I) Feed for birds @ ₹ 15/kg/bird/day	2,34,750
	II) Medicine and veterinary @ ₹ 20/month/bird	12,000
	III) Labour @₹ 4000/month	48,000
	IV) Electricity @ ₹ 800 /month	9,600
	V) Miscellaneous	1,000
	VI) Interest on working capital (11%)	33,589
	Total variable cost (A)	3,38,939
2	Fixed cost	
	I) Interest on fixed capital (9%)	73,452
	II) Depreciation	2,274
	III)Rental value	6,000
	IV)Revenue	4
	Total fixed cost (B)	81,730
3	Total cost (A+B)	4,20,669
4	Returns	
	I) Return from sale of 750 eggs @ ₹ 1300 /egg	975000
	II) Return from sale of 50 bags of manure @ ₹ 400 /bag	20,000
	Total returns	9,95,000
5	Net Returns	5,74,331

price of ₹ 1300 per egg amounted to ₹ 9,75,000. In addition, the small farms could generate ₹ 20,000 by selling 50 bags of manure at the rate ₹ 400 per bag. Thus, the total annual returns for a small Emu farm were ₹ 9,95,000 and the net returns were ₹ 5,74,331.

4.3.3 Financial feasibility in large scale Emu farming with 300 pairs of birds

In this study, an attempt was made to analyse the financial feasibility of Emu farming both for large and small scale farms. The assumptions underlying the feasibility study for both types of farms are mentioned in methodology chapter. Table 4.6 presents projected cash inflows, cash out flows and net cash flows from large scale Emu farming enterprise with 300 pairs of two year old birds. The cash flows are indicated in the table for 15 years, the life of the project assumed in the study. Cash inflows are the sum total of returns from eggs, chicks and manure each year during the life of the project. However, during the 15th year, which is the terminal year of the project, the cash flows also include the returns from the sale of the birds. The cash out flows include various items of expenditure such as feed cost, electricity charges, veterinary expenditure, depreciation, interest on working capital etc. The total initial investment to be made for the large size Emu farm would be ₹ 97,87,800. The net cash flows of ₹ 14,08,782 for the first year would keep on growing during entire life of the project and would be of the size of ₹ 2,87,19,255 during the 15th year, when the project will be terminated.

Measures of financial feasibility in large scale Emu farming calculated based on the cash flows of table 4.6 are presented in table 4.7. These measures are worked out assuming a discount rate of 9 per cent. It can be seen from the table that the net present value (NPV) from the 15 years project would be of the order of ₹ 8,60,90,543. The benefit cost ratio happened to be 9.79 with the internal rate of return (IRR) of 70 per cent. The feasibility analysis would also suggest that initial investment would be recovered in 2.25 years.

A sensitivity analysis was conducted to know the response of NPV, B C ratio, IRR and payback period to unfavorable changes in egg and chick prices. Five scenarios of unfavorable changes in egg and chick prices were created as against the base scenario in which egg and chick prices were assumed to grow at five per cent during the life of the project. The results of this sensitivity analysis conducted for large Emu farms are presented in table 4.8. In scenario -1 with three per cent growth in egg and chick prices, NPV was ₹ 7,16,19,882; B-C ratio was 8.31; IRR was 67 per cent and payback period was 2.4 years. In scenario 2 with just one per cent growth in egg and chick prices, NPV was ₹ 5,91,81,944; B-C ratio was 7.04; IRR was 64 per cent and payback period was 2.5 years. In scenario - 3, a negative growth of one per cent in egg and chick prices was assumed. This scenario resulted in NPV of ₹ 4,84,70,398; B-C ratio of 5.95; IRR of 61 per cent and payback period of 2.65 years. Scenario -4, which assumed negative growth of three per cent in egg and chick prices indicated NPV of ₹ 3,92,25,357, B-C ratio of 5.00, IRR of 57 per cent and payback period of 2.85 years. Scenario -5 with negative growth of five per cent in egg and chick prices led to NPV of ₹ 3,12,26,555 B-C ratio of 4.19, IRR of 54 per cent and payback period of 3.00 years.

The result of the sensitivity analysis conducted with respect to feed cost and labour cost are presented in table 4.9 and 4.10 respectively. The results indicated that the project would be financially feasible despite unfavourable changes in feed and labour costs compared to their base values.

4.3.4 Financial feasibility in small scale Emu farming with 25 pairs of birds

Financial feasibility analysis was also conducted for small scale Emu farm of 25 pairs of two year birds. Table 4.11 presents cash out flows, cash inflows and net cash flows for each year during the life of the project, which was assumed to be 15 years. As the table shows, the initial investment for small Emu farm would be ₹ 9,41,140. From the first year (when the birds attained the age of three years), cash inflows from the sale of eggs and manure start. In the first year, net cash flows would be ₹ 28,993, which keep on growing till the terminal year of the project i.e. 15th year. During the 15th year, cash out flows would be 6,19,686, inflows would be ₹ 19,70,032 and net cash flows would be ₹ 18,50,346.

The results of cash flow estimation presented in table 4.11 were used to compute the financial feasibility measures for small scale Emu farm. Table 4.12 shows computed values of NPV, BCR, IRR and payback period assuming the discount rate of 9 per cent. The table reveals that net present value (NPV) would be of the order of ₹ 47,16,840. The benefit cost ratio (BCR) would be 6.11; internal rate of return (IRR) would be 49 per cent and payback would be 2.73 years for the small Emu farm.

Table 4.6 Projected cash flows in large scale Emu farming with 300 pairs of birds

Year	Cash out flows (₹)	Cash inflows (₹)	Net cash flows (₹)
0	97,87,800	0	-97,87,800
1	32,30,218	46,39,000	14,08,782
2	33,88,558	99,89,700	66,01,143
3	35,55,047	1,61,94,623	1,26,39,576
4	37,30,078	1,70,04,354	1,32,74,276
5	39,14,065	1,78,54,571	1,39,40,507
6	41,07,444	1,87,47,300	1,46,39,856
7	43,13,273	1,96,84,665	1,53,71,392
8	45,26,708	2,06,68,898	1,61,42,190
9	47,55,996	2,17,02,343	1,69,46,347
10	49,93,069	2,27,87,460	1,77,94,392
11	52,40,622	2,39,26,833	1,86,86,211
12	55,00,722	2,51,23,175	1,96,22,453
13	57,75,391	2,63,79,334	2,06,03,943
14	60,62,416	2,76,98,300	2,16,35,884
15	63,63,960	2,90,83,215	2,87,19,255

Table 4.7 Measures of financial feasibility in large scale Emu farming

Measures	Values
NPV (₹)	8,60,90,543
BCR	9.79
IRR (%)	70
Payback period (years)	2.25

Table 4.8 Sensitivity analysis for large scale Emu farms for unfavorable growth rates in egg and chick prices

Scenario	Growth rate of egg and chick prices (%)	NPV (₹)	B:C Ratio	IRR (%)	Payback period (years)
I	3	7,16,19,882	8.31	67	2.43
II	1	5,91,81,944	7.04	64	2.50
III	-1	4,84,70,398	5.95	61	2.65
IV	-3	3,92,25,357	5.00	57	2.85
V	-5	3,12,26,555	4.19	54	3.00

Note: In the base scenario, growth in chick and egg prices was assumed to be 5 %

Table 4.9 Sensitivity analysis for large scale Emu farms for unfavorable growth rates in feed cost

Scenario	Growth rate of feed costs (%)	NPV (₹)	B:C Ratio	IRR (%)	Payback period (years)
I	10	7,33,02,104	8.48	66	2.80
II	15	5,58,88,765	6.71	62	3.00
III	20	2,92,47,813	3.98	57	3.10

Table 4.10 Sensitivity analysis for large scale Emu farms for unfavorable growth rates in labour cost

Scenario	Growth rate of labour costs (%)	NPV (₹)	B:C Ratio	IRR (%)	Payback period (years)
I	8	8,51,99,636	9.70	71	2.65
II	12	8,44,39,682	9.62	72	2.74
III	15	8,36,96,040	9.55	73	2.85

Table 4.11 Projected cash flows for small scale Emu farming with 25 pairs of birds

Year	Cash out flows (₹)	Cash inflows (₹)	Net cash flows (₹)
0	9,41,140	0	-941,140
1	3,16,007	3,45,000	28,993
2	3,31,341	7,03,500	3,72,160
3	3,47,467	10,96,988	7,49,521
4	3,64,426	11,51,837	7,87,411
5	3,82,259	12,09,429	8,27,170
6	4,01,012	12,69,900	8,68,888
7	4,20,730	13,33,395	9,12,665
8	4,41,462	14,00,065	9,58,603
9	4,63,262	14,70,068	10,06,806
10	4,86,181	15,43,572	10,57,391
11	5,10,277	16,20,750	11,10,473
12	5,35,611	17,01,788	11,66,177
13	5,62,245	17,86,877	12,24,632
14	5,90,247	18,76,221	12,85,974
15	6,19,686	19,70,032	18,50,346

Table 4.12 Measures of financial feasibility in small scale Emu farming

Measures	Values
NPV (₹)	47,16,840
BCR	6.11
IRR (%)	49
Payback period (years)	2.73

Table 4.13 Sensitivity analysis for small scale Emu farms for unfavorable growth rates in egg prices

Scenario	Growth rate of egg and chick prices (%)	NPV (₹)	B:C Ratio	IRR (%)	Payback period (years)
I	3	37,51,804	4.98	46	2.78
II	1	29,22,284	4.10	43	2.85
III	-1	22,07,856	3.34	39	2.92
IV	-3	15,91,196	2.69	35	3.00
V	-5	10,57,617	2.12	30	3.15

Note: In the base scenario, growth in egg prices was assumed to be 5 %

Table 4.14 Sensitivity analysis for small scale Emu farms for unfavorable growth rates in feed cost

Scenario	Growth rate of feed costs (%)	NPV (₹)	B:C Ratio	IRR (%)	Payback period (years)
I	10	36,51,508	4.87	45	3.23
II	15	22,00,397	3.33	39	3.35
III	20	-19,682	0.97	8.95	4.25

Table 4.15 Sensitivity analysis for small scale Emu farms for unfavorable growth rates in labour costs

Scenario	Growth rate of labour costs (%)	NPV (₹)	B:C Ratio	IRR (%)	Payback period (years)
I	8	51,13,069	6.43	51	3.18
II	12	50,97,236	6.41	52	3.20
III	15	50,81,651	6.39	53	3.25

Table 4.13 presents the sensitivity analysis conducted for the decision criteria of NPV, B-C ratio, IRR and payback period with respect to egg prices. The purpose of conducting the sensitivity analysis was to examine the adverse effect of unfavorable change in Egg prices on decision criteria mentioned above. For this, five unfavorable scenarios with regard to egg prices were created. Scenario -1 and 2 indicated positive growth of 3 per cent and 1 per cent in egg prices respectively as compared to the base scenario of 5 per cent growth in egg prices. Scenarios 3, 4 and 5 reflected negative growth of 1 per cent, 3 per cent and 5 per cent respectively in egg prices. In all these scenarios, NPV, B-C ratio, IRR were less than in the base scenario, while payback period increased. Specifically, in scenario 1 NPV was ₹ 37,51,804, B-C ratio was 4.98, IRR was 46 per cent and payback period was 2.78 years. In scenario 2, NPV was ₹ 29,22,284, B-C ratio was 4.10, IRR was 43 per cent and payback period was 2.85. In scenario 3, NPV fell down to ₹ 22,07,856, while B-C ratio decrease to 3.34. IRR was 39 per cent with payback period rising to 2.92 years. The NPV, B-C ratio, IRR and payback period in scenario 4 were ₹ 15,91,196, 2.69, 35 per cent and 3 years respectively. In the last scenario, the NPV diminished to ₹ 10,57,617, while B-C ratio, IRR and payback period were 2.12, 30 per cent and 3.15 years respectively.

The results of sensitivity analysis conducted with respect to feed cost and labour cost are presented in tables 4.14 and 4.15. These results indicated that small scale Emu farming would be still feasible in the face of future escalation of feed and labour costs.

4.4 Marketing arrangements for Emu farming products.

4.4.1 Marketing arrangements of large scale Emu units

Marketing arrangements for Emu products of both large and small farms were studied, the results of which are presented in table 4.16 and 4.17 respectively. Table 4.16 shows that Emu products sold by large farms were eggs, chicks and manure. The large farms sold all the eggs procured from small farms and 80 per cent of the eggs produced on their farms and they also sold 80 per cent of the manure produced and retained 20 per cent for self use. These farms sold eggs and chicks on the farm itself to the buyers from Andra Pradesh, Tamil Nadu and Kerala. However manure was sold to the neighbouring farmers on the farm.

The cost of packing of eggs, trays and egg transportation from small farms is borne by the large farm units only. The buyers from other states who visit the large farms for buying eggs and chicks take care of packing and transportation themselves. In respect of manure, the neighboring buyers meet the expenditure associated with packing and transportation.

The price of eggs and chicks are not predetermined. They are subject to variation depending upon market condition. The current price of three month old chicks would range between ₹ 2500 to ₹ 3000 per pair. An egg would cost around ₹ 1400 to ₹ 1600. The transactions are carried out in cash.

4.4.2 Marketing arrangements of small scale Emu units

The marketing arrangements of small scale Emu units are presented in table 4.17. In this case, Emu products sold include eggs and manure. The small units sell all the eggs to the large units and 60 per cent manure to the neighboring farmers. The units operate with the understanding that the eggs on their farms are necessarily purchased by the large units. In respect of both egg and manure sale, the cost of packing and transportation is born by the buyers. The price received by the small farms for egg changes depending upon market condition and is presently in the range of ₹ 1200 to ₹ 1400 per egg. All transactions are carried out in cash.

4.5 Problems encountered in production and marketing of Emu products.

4.5.1 Production related problems faced by Emu rearing units

Table 4.18 presents production related problems faced by small scale and large scale units of Emu farming. It can be seen from the table that high initial investment was a problem faced by all the ten small units of Emu farming. The problem of electricity failure and non availability of technically skilled labour was experienced by 80 per cent and 70 per cent of small units respectively. Half of the small units expressed that non availability of feed in time and non availability of vaccines and veterinary aids were the problems faced. 30 per cent of small units faced the problem of bird mortality.

Table 4.16 Marketing arrangements of large scale Emu units

S.No	Particulars	Details
1	Emu products sold	Eggs, chicks and manure. The large units sell all the eggs procured from the small scale units. However, they sell only 80 percent of the eggs produced on their farms. The remaining 20 percent of the eggs are used for hatching and normally, all the chicks hatched are sold. In the case of Emu manure, 20 percent is retained on the farm, while the rest is sold
2	Method of sale	The eggs and chicks from large sized farms are purchased on the farm itself by the buyers from Andra Pradesh, Tamil Nadu and Kerala. The manure from the large farms is purchased on the farm by the neighbouring farmers.
3	Packing and transportation cost	When purchasing eggs from the small farmers, the large farm operators pack the eggs in trays. The cost of trays, packing, and transportation of eggs from small farms is borne by the large farm operators. When the buyers from Andra Pradesh, Tamil Nadu and Kerala visit large farms for purchasing eggs and chicks, they fully bear all the costs of packing and transportation. Similarly, the farmers who purchase manure from the large farms take care of packing and transportation cost themselves.
4	Price of eggs and chicks	Prices of eggs and chicks are not predetermined and vary depending upon market conditions. Presently three month old chick prices range between ₹ 2500 to ₹ 3000 per pair, while the egg prices range between ₹ 1400 to ₹ 1600 per egg.
5	Mode of payment	All transactions are paid for in cash at the time of transaction.

Table 4.17 Marketing arrangements of small scale Emu units

S.No	Particulars	Arrangements
1	Emu products sold	Eggs and manure. These units sell the eggs to large Emu rearers located at Hubli and Sulla. They sell all the eggs produced on their farms. In the case of Emu manure 40 percent is retained on the farm while the rest is sold to neighbouring farmers
2	Method of sale	Small Emu farmers operate with the guarantee from large farm operators that the latter would buy eggs from them. The buyers visit the small units and lift the eggs from there. Similarly, the manure buyers also visit small Emu units for purchasing manure.
3	Packing and transportation cost	Large farm operators procure eggs directly from small farms. Eggs are packed in trays and packing cost is borne by the buyers. Transportation is also the responsibility of buyers. Similarly, the farmers who purchase manure from the small farms take care of packing and transportation cost themselves.
4	Price of eggs	Prices of eggs are not predetermined and can vary depending upon market conditions. Presently, the egg prices range between ₹ 1200 to ₹ 1400 per egg.
5	Mode of payment	All transactions are paid for in cash at the time of transaction.

Table 4.18 Production related problems faced by Emu rearing units

S. No	Problems	Large scale units (n=2)		Small scale units (n=10)	
		Number	Percentage	Number	Percentage
1	High initial investment	1	50	10	100
2	Electricity failure	1	50	8	80
3	Non availability of technically skilled labour	0	0	7	70
4	Non availability of feed in time	0	0	5	50
5	Non availability of vaccines and veterinary aids	1	50	5	50
6	Mortality of birds	1	50	3	30
7	Maintenance of incubator	1	50	NA	NA

In the case of large units, the problem of high initial investment, mortality of birds, non availability of vaccines, veterinary aids, electricity failure and maintenance of incubator was experienced by one unit each out of the two study units. Neither unit had any problem with regard to availability of feed on time and availability of technically skilled labour.

4.5.2 Marketing problems faced by Emu rearing units

The marketing problems analysed in respect of ten small scale units and two large scale units are presented in table 4.19. The marketing problems identified in consultation with small and large Emu rarers were eight in number. They were: (a) absence of local demand for Emu eggs or meat (b) complete reliance only on a few buyers (c) lack of knowledge about the alternative domestic markets for Emu products (d) absence of information on export avenues and agencies (e) wide fluctuation in manure price (f) absence of institutional arrangements for dissemination of market information (g) fear of losing patronage of regular buyers of eggs and chicks and (h) non existence of Emu products processing facilities. It was interesting to note that all the ten small emu farms faced each one of these problems. The situation, however, was different in the case of large units. Neither of the two units faced problem of lack knowledge of alternative domestic market for selling Emu products; nor had they any fear of losing their regular buyers. However, the absence of local demand for Emu eggs and meat, absence of institutional arrangements to disseminate market information dissemination and non existence of Emu processing facilities were the problems for both the large units. The other problems of reliance on a few buyers, absence of information on export market and fluctuating manure prices were experienced by only one of the two large units.

4.5.3 Opinions of Emu rearers

To elicit the opinions of Emu rearers regarding their Emu enterprise certain questions were posed to them and responses were collected. The questions asked to both small and large units and their responses are presented in table 4.20. When asked if they faced any difficulty in disposing eggs/chicks in time, each small and large rearer replied ‘NO’. Similarly, no one from small or large units expressed that he was a victim of default in payment by the buyers. 50 per cent of small units and no large units replied in affirmity when asked if they ever felt that the Emu farming prospects were not as bright as they thought. With regard to the impression made on the neighbours, 30 per cent small units felt that their impression on the neighbors is enough to motivate them to start Emu units and the remaining 70 per cent felt that they could not make such impression. In the case of large farms, while one unit claimed of such impression, the other one did not see any such influence on the neighbors. While all the small units felt that they were carrying out the business at buyers’ mercy, no such opinion was expressed by large units. Both the large and small units were of the opinion that the returns from Emu farming were quite satisfactory. Not surprisingly, none of the units felt that they missed a better opportunity for investing their money. 40 per cent of the small units and both the large units expressed that they would whole heartedly recommend Emu farming venture to their friends and relatives.

Table 4.19 Marketing problems faced by Emu rearing units

S. No	Marketing Problems	Large scale units (n=2)		Small scale units (n=10)	
		Number	Percentage	Number	Percentage
1	Absence of local demand for Emu eggs/ meat	2	100	10	100
2	Absence of institutional arrangements for dissemination of market information concerning Emu products	2	100	10	100
3	Non existence of Emu products processing facilities	2	100	10	100
4	Absence of information about export avenues and export agencies	1	50	10	100
5	Wide fluctuation in manure price depending on demand conditions	1	50	10	100
6	Complete reliance only on a few buyers	1	50	10	100
7	Constant fear of losing the patronage of regular buyers of eggs/ chicks	0	0	10	100
8	Lack of knowledge about the alternative domestic markets where Emu products can be sold	0	0	10	100

Table 4.20 Opinions of Emu rearers

S.No	Questions asked	Response			
		Large units		Small units	
		YES	NO	YES	NO
1)	Have you ever faced difficulty in disposing your eggs/ chicks in time?	0 (0)	2 (100)	0 (0)	10 (100)
2)	Have you ever been victim of default in payment by your buyers?	0 (0)	2 (100)	0 (0)	10 (100)
3)	Have you ever been informed by any source that the prospects of Emu rearing are not as bright as they are depicted?	0 (0)	2 (100)	5 (50)	5 (50)
4)	Has your business impressed your neighbours such that they will start planning for Emu rearing?	1 (50)	1 (50)	3 (30)	7 (70)
5)	Have you ever felt that you are carrying out business at your buyers' mercy?	0 (0)	2 (100)	10 (100)	0 (0)
6)	Do you feel your returns from Emu farming are quite satisfactory?	2 (100)	0 (0)	10 (100)	0 (0)
7)	Have you ever felt that you had better option to invest your money rather than taking up Emu rearing?	0 (0)	2 (100)	0 (0)	10 (100)
8)	Do you whole heartedly recommend this venture to your friends/ relation?	2 (100)	0 (0)	4 (40)	6 (60)

DISCUSSION

The discussion of the results is presented under the following heads.

5.1 Socio-economic conditions of farmers engaged in Emu farming

5.2 Investment pattern for Emu farms.

5.3 Business performance of Emu farms

5.4 Marketing arrangements for Emu farming products

5.5 Problems encountered in production and marketing of Emu products

5.1 Socio-economic conditions of farmers engaged in Emu farming

The findings pertaining to socio-economic conditions of farmers engaged in Emu farming are presented in table 4.1 of the previous chapter. The results revealed that a majority of the small farmers engaged in Emu rearing were aged between 35 and 50 years. While one large Emu rearer was relatively young (less than 35 years), the other was relatively aged (more than 50 years). In respect of educational level of Emu rearers, it was clear that both the large rearers had education beyond primary level. Among the small rearers, only one (10 per cent) was illiterate. 80 per cent of them had education beyond primary level, with 50 per cent of them having college education. This observation, in particular indicates that the farmers engaged in Emu rearing are well educated in general. It was also indicated by the results that a majority of the small rearers (70 per cent) had medium sized families (4-8 members). In the case of large rearers, one had small family, while the other had medium sized family. Interestingly, Emu farming was the main occupation for all the large and small rearers. Both the large rearers had other agricultural activities as well as non agricultural activities as subsidiary occupation. Similarly, all the ten small rearers had subsidiary occupation in the form of other agriculture and allied activities; six of them had subsidiary activities in non agricultural sector. Both the large Emu rearers had annual income of more than ₹ 10 lakhs. However, no small rearer had annual income of this magnitude. The annual income of a majority of small rearers (80 per cent) ranged from ₹ 5 to 10 lakhs.

5.2 Investment pattern for Emu farms.

5.2.1 Investment pattern for large scale Emu farm

The investment pattern for large Emu farms with the herd size of 300 pairs of birds is presented in table 4.2. A perusal of the table reveals that cost of the birds (₹ 90,00,000) had a lion's share (92 per cent) in the total investment of the unit (₹ 97,87,800). The outlay for birds was huge since the cost of a pair of two year old birds normally bought to set up Emu farm was very high at ₹ 30,000. The other items of expenditure, which required an outlay of a minimum of ₹ 1,00,000 were fencing (₹ 2,17,800), incubator (₹ 1,00,000) and borewell with accessories (₹ 1,00,000). The shelter shed also formed a sizable portion (₹ 96,000) in the total investment requirement. These five components of investment accounted for 97 per cent of the total investment expenditure of Emu farm with 300 pairs of birds. The remaining 3 per cent investment expenditure was accounted for by the components like office room, furnishing, hatching room, feed store room and equipments like tub, barrel etc.

5.2.2 Investment pattern for small scale Emu farm

Investment pattern for small scale Emu farm with 25 pairs of birds is presented in table 4.3. In this case also, cost of the birds was the largest component of the total investment expenditure of ₹ 9,41,140. Specifically, the cost of the birds amounted to ₹ 7,50,000, which formed 79.7 per cent of the total investment expenditure. The other components of small scale investment, which accounted for more than two per cent each of the total investment, included fencing (6.94 per cent), borewell with accessories (4.25 per cent), store room (5.36 per cent) and shelter shed (2.55 per cent). These components together accounted for around 99 per cent of total investment expenditure. Furnishing and the equipments like tub, barrel and water can formed the remaining small proportion of around one per cent.

5.3 Business performance of Emu farms

5.3.1 Costs and returns in large scale Emu farm

The findings relating to the costs and return in large scale Emu farm per annum are presented in table 4.4. It is clear from the table that the total cost incurred for the Emu farm with 300 pairs of birds was ₹ 43,05,552. This was composed of the total variable costs amounting to ₹ 35,37,570 and total fixed cost amounting to ₹ 7,67,982. The variable cost, which formed 82 per cent of the total cost consisted of feed cost, veterinary expenses, labour charges, electricity charges, packing charges and the interest on working capital. It may be seen from the table that feed cost was huge at ₹ 28,17,000, accounting for around 80 per cent of the total variable cost. Interest on working capital, labour charges and veterinary charges accounted for 9.90 per cent, 5.43 per cent and 4.07 per cent of the total variable cost.

The fixed cost amounting to ₹ 7,67,982 formed around 18 per cent of the total cost. The major component of the fixed cost, which accounted for 95 per cent was interest on fixed capital. The other items, which had a small share in the fixed costs were rental value, depreciation on building, depreciation on incubator and land revenue.

With regard to the returns, it can be seen from the table that the sale of eggs, chicks and manure fetched an annual return of ₹ 1,46,89,000. The returns from eggs at the rate of ₹ 1500 per egg were the most important source of revenue forming 73.5 per cent of the total returns. This was followed by the return from the sale of chicks (₹ 2500 per chick) which stood at 24 per cent of the total return. The return from the sale of manure, which amounted to ₹ 64,000 was the smallest component of total returns. The large farm, as a result, earned the net returns of ₹ 1,03,83,448 per annuum.

5.3.2 Costs and returns in small scale Emu farm

The costs and return structure for small scale Emu farms is given in table 4.5. It can be made out from the table that the total cost of farming per annum was₹ 4,20,669. This was made up of fixed costs of ₹ 81,730 and variable costs of ₹ 3,38,939. The variable costs formed around 81 per cent of the total cost. The size of the variable costs was determined mainly by the cost of feed for birds, which was as high as ₹ 2,34,750 (69 per cent of the total variable costs). The other components of variable costs, namely, labour charges, interest on working capital, veterinary charges, electricity charges and miscellaneous charges formed 14.16 per cent, 9.95 per cent, 3.5 per cent, 2.8 per cent and 0.3 per cent respectively.

The major component of fixed cost (₹ 81,730) was interest on fixed capital which was as high as around 90 per cent. The other components of fixed costs in the decreasing order of magnitude were rental value, depreciation and land revenue. The small Emu farms did not rear chicks. As such, the income from farming for small farms consisted of the revenue from the sale of eggs and manure. In the total returns of ₹ 9,95,000, the return from the sale of eggs had a huge share of 98 per cent. The remaining share of two per cent was that of manure. The annual net returns for the small farm with 25 pairs of birds was ₹ 5,74,331.

5.3.3 Financial feasibility in large scale Emu farming

With a view to assessing the financial feasibility of large scale Emu farm (with the herd size of 300 pairs of birds), the feasibility criteria of net present value (NPV), internal rate of return (IRR), benefit cost ratio (B-C ratio) and payback period were computed after projecting the cash inflows and cash out flows assuming a life span of 15 years. The large size farm was assumed to have been setup with two year old Emu birds. The required information for financial feasibility analysis such as cost of two year old birds, egg and chick prices, manure prices, labour charges, electricity charges, salvage value of the project etc was determined in consultation with the operators of the existing Emu farms in and around Hubli-Dharwad area. A discount rate of 9 per cent was assumed for calculating the feasibility criteria such as NPV, IRR, and B-C ratio. Further, in order to know how sensitive the computed feasibility measures would be to the unfavorable changes in the assumed values of certain parameters in the base scenario, a sensitivity analysis was also conducted.

Table 4.6 presents projected cash flows in respect of large Emu farm for 15 years. The initial investment for Emu farm would be ₹ 97,87,800. The cash out flows in year 1 would be ₹ 32,30,218, which would keep on growing until they reached the level of ₹ 63,63,960 in the 15th year. The cash

inflows would be ₹ 46,39,000 in the first year, which would eventually reach the level of ₹ 2,90,83,215. The net cash flows would increase from ₹ 14,08,782 in year 1 to ₹ 2,87,19,255 in year 15.

The project would be highly feasible based on each feasibility criterion computed (table 4.7). The NPV would be as large as ₹ 8,60,90,543. This implied that the wealth of the entrepreneur undertaking this venture would increase by around ₹ 8,61,000,00. The benefit cost ratio of 9.79 indicated that each rupee invested in large scale Emu farming would yield net cash flows of ₹ 9.79. Further, the IRR of 70 per cent was much larger than the cost of capital (9 per cent) implying that it was worthwhile to invest money in Emu enterprise. The payback period of 2.25 years indicated that the project would generate enough returns to recover entire initial investment in just 2.25 years.

The results of the sensitivity analysis with respect to egg and chick prices in the case of large sized Emu farm are presented in table 4.8. For conducting sensitivity analysis, five scenarios of adverse movement in egg and chick prices were created in comparison with the base year assumption of five per cent annual growth in egg and chick prices throughout the project period. Scenario 1 indicated only three per cent growth in egg and chick prices instead of five per cent growth. This scenario resulted in NPV of ₹ 7,16,19,882, B-C ratio of 8.31, IRR of 67 per cent and payback period of 2.43 years. Scenario 2 showing one per cent growth in egg and chick prices would still lead to substantially high NPV (₹ 5,91,81,944), B-C ratio (7.04) and IRR (64 per cent). Payback period would be just 2.5 years. Scenarios 3, 4 and 5 indicated negative growth in egg and chick prices. Scenario 3 which stood for -1 per cent growth in egg and chick prices, would still result in high NPV, B-C ratio, IRR and a comfortable payback period of just 2.65 years. In the present sensitivity analysis, scenario 5 represented the most adverse changes in egg and chick prices, with -5 per cent growth. Even in this scenario, the NPV would be more than ₹ 3,00,00,000 and B-C ratio would be more than four implying that each rupee invested would return a net cash flow of ₹ 4.19. The IRR would also be high at 54 per cent. Further, the entrepreneur would recover entire investment in just three years.

The results presented in tables 4.9 and 4.10 indicated that project would still be feasible even if feed cost would grow at as high as 20 per cent and labour cost would grow at as high as 15 per cent instead of their base scenario growth rates.

5.3.4 Financial feasibility in small scale Emu farming

The projected cash flows in respect of a small scale Emu farm with 25 pairs of birds are presented in table 4.11. As revealed by the table, the initial investment required for the enterprise is ₹ 9,41,140. The cash out flows during the first year of venture would be ₹ 3,16,000, which would keep on growing throughout the life of the project and attain the level of ₹ 6,19,686. The cash inflows would also show increasing trend beginning at ₹ 3,45,000 in the first year till they reach the level of ₹ 19,70,000. As a result, the net cash flows, which would be around ₹ 29,000 in the first year would keep on rising and equal ₹ 18,50,346.

The financial feasibility measures namely NPV, B-C ratio, IRR and payback period calculated based on the cash flow pattern mentioned above are presented in table 4.12. The estimated NPV implies that the entrepreneur taking up small scale Emu farming with 25 pairs of birds would evidence an increase in his wealth to the extent of ₹ 47,16,840. The B-C ratio of 6.11 implied that the benefit for every rupee invested in the business would be to the extent of ₹ 6.11. The IRR at 49 per cent was much above the cost of capital at 11 per cent. All these three measures established the financial feasibility of the small scale Emu farm. Also, the payback period was highly encouraging in that it indicated that the entire initial investment would be recovered in less than three years.

A sensitivity analysis was carried out for small scale Emu farm also as in the case of large scale Emu. Here also, five scenarios of growth in egg prices were created, which represented the growth in egg price at less than five per cent, the rate assumed in the base scenario. The growth rate in egg price represented by scenarios 1 to 5 were 3 per cent, 1 per cent, -1 per cent, -3 per cent and -5 per cent in that order. The results of the sensitivity analysis are presented in table 4.11. The NPV's projected under scenarios 1 to 5 were ₹ 37,51,804; ₹ 29,22,284; ₹ 22,07,586; ₹ 15,91,196 and ₹ 10,57,617. This clearly indicated that the project would be financially feasible even under the worst scenario assumed in this analysis (-5 per cent growth in egg prices) as the NPV would be still a huge positive number of ₹ 10,57,617. Similarly, the benefit cost ratio would be 4.98 in the first scenario and 2.12 in the worst scenario indicating that each rupee invested could get the entrepreneur a net cash

flow of ₹ 2.12, even if the egg prices declined at 5 per cent. The internal rate of return also established the financial feasibility of the project as it would be 30 per cent in the worst scenario far exceeding the cost of capital. Finally, the payback period would also be comfortable as per the sensitivity analysis. Even assuming that egg price would fall by five 5 per cent, the project would pay for itself in just 3.15 years.

The results presented in the tables 4.14 and 4.15 indicated that the small scale Emu rearing would be feasible even if feed cost and labour cost grew at 15 percent each.

5.4 Marketing arrangements for Emu farming products.

5.4.1 Marketing arrangements of large scale Emu units

The marketing arrangements of large and small Emu farms were analysed in the present study. The findings pertaining to the large scale farm are presented in table 4.16. With regard to the products sold, it can be seen from the table that large farms sell eggs, chicks as well as manure. It may be noted that the large Emu farms procure Emu eggs from small farms. While selling all the eggs procured from small units, the large units sell only 80 per cent of the eggs produced on their farms. The remaining 20 per cent eggs produced on the farm are used for hatching, and all the hatched chicks are sold. It was observed that these large units apply 20 per cent of the manure produced on their farms and sell out the remaining 80 per cent to the neighbouring farms. Both Eggs and chicks are disposed of by these units on the farm itself to the buyers from other states like Andra Pradesh, Tamil Nadu and Kerala.

As for the prevailing practices, the buyers bear the transportation and packing cost. As such, the large units bear the cost of trays and other packing charges as well as the transportation charges to carry the eggs from the small farms to their establishment. Similarly, the buyer from Andra Pradesh, Tamil Nadu and Kerala visiting the large farms for the purchase of eggs and chicks take care of all the packing and transportation expenditure. In respect of manure also, the buyer from the neighbouring farmers take care of this expenditure.

There is no contractual agreement between the buyers and sellers of eggs and chicks with regard to the prices. As such, these prices are determined based on the market conditions of supply and demand. Presently, price of three month old chicks ranges between ₹ 2500 to ₹ 3000 per pair and that of eggs sold by large farms ranges between ₹ 1400 to ₹ 1600. There is no system of credit sales, and all transactions are carried out in cash.

5.4.2 Marketing arrangements of small scale Emu units

Table 4.17 presents the findings relating to the marketing arrangement of small scale Emu units. It may be seen from the table that the small units sell only eggs and manure. All eggs are sold to the large units at Hubli and Sulla. In the case of manure, the small units retain 40 per cent for on farm use and sell the rest to the neighbouring farmers. The buyers of the eggs and manure visit the Emu farms and pick the material from there. The cost of egg trays, other packing charges and transportation cost is entirely borne by the buyers. Similarly, all the costs incurred in lifting and transporting the manure is met by the purchasers. As mentioned above, egg prices are not determined in advance and are subject to market fluctuations. Presently, the prices at which the small farmers sell their eggs to the large farmers range between ₹ 1200 to ₹ 1400 per egg.

5.5 Problems encountered in production and marketing of Emu products.

5.5.1 Production related problems faced by Emu rearing units

The production related problems faced by Emu units are documented in table 4.18. For large scale units the problems faced were high initial investment, mortality of birds, non availability of vaccines and veterinary aids, electricity failure and maintenance of incubator. As table 4.2 shows, the cost of birds amounting to ₹ 90,00,000 constitutes 92 per cent of the total investment cost. This huge cost is on account of very high price of Emu at ₹ 30,000 per pair. Of the two farms engaged in large scale Emu farming, one farm pointed out that mortality of birds was also a problem faced. The owner of the unit facing this problem mentioned that during the previous two years he suffered the losses on account of five per cent mortality rate, which would amount to big financial loss on account of high cost of birds. Also, non availability of vaccines and veterinary aids, electricity failure and maintenance of incubator were the problems faced by one farm each. Smooth electricity supply is required for Emu

farming in general and egg hatching in particular. The fluctuating power supply acts as an impediment in Emu rearing activity.

In respect of small Emu units also, high initial investment was the most significant problem as this problem was pointed out by all the ten units. Failure of electricity, the smooth supply of which is essential for maintenance of farm was the problem for 80 per cent of the small units. Rearing of Emu birds requires special skills. According to the Emu unit owners, they have to depend on skilled labour available in other states like Andra Pradesh, Tamil Nadu and Kerala. Or else, they have to depend on the locally available workers who are adequately trained in Emu raring. As such, non availability of technically skilled labour was the problem faced by 70 per cent of the units. Mortality of birds was another problem which was faced by only 30 per cent small units.

5.5.2 Marketing problems faced by Emu rearing units

Marketing problems reported by Emu units are presented in table 4.19. Of the eight problems on which the large units were asked to comment, only six turned out to be pertinent to them. Specifically, the problem relating to the absence of local demand, absence of institutional arrangements for dissemination of market information and the problem of non existence of Emu products processing facility were faced by both the large units studied. As a matter of fact, these are the problems which are hindering the expansion of Emu rearing business in the region. As local use of eggs and meat for consumption is almost absent in the state, more so in the study area, the units do not find any local market for their products. This naturally puts the entrepreneurs in a disadvantageous situation. Also these operators have no means to get the market information from any institutional setup. For such information, they have to seek only the opinions of their clients from other states. The absence of Emu product processing is indeed a big obstacle in Emu for enterprise in the region. This is depriving the Emu units of extra profits they could get from value added products. The other problems experienced by one large scale unit each included complete reliance on only a few buyers, absence of information about export avenues and wide fluctuations in manure prices. It may be noted that these units depended only on a few selected buyers from the neighbouring states of Andra Pradesh, Tamil Nadu and Kerala. As such, the Emu units lacked bargaining power while disposing the products. Also, there is no systematic and reliable information on export avenues for Emu eggs and meat, and the agencies involved in the export business. Because of this, the large units are finding it hard to enjoy the benefits of export business, which exist as per some reports. Further, it is the experience of Emu units that the neighbouring farmers do not have the strong preference for Emu manure for application on their farms. Because of this, the units face wide fluctuation in manure prices.

All the small Emu units invariably faced the above problems identified in respect of large Emu units. In addition, all the ten small units encountered the problem of (i) lack of knowledge about the alternative domestic market, where Emu products can be sold and (ii) constant fear of losing the patronage of their regular buyers. As against the large Emu units, which had some knowledge of domestic markets, the small operators were totally in dark as per this issue was concerned. This constituted a problem for them since they had no idea about where they could alternatively sell their products domestically in the event of adverse terms with the two large units on whom they depended for their business. It is on account of this peculiar situation that the all small units were constantly operating under the fear of losing their business dealings with the large units.

5.5.3 Opinions of Emu rearers

An effort was made to collect the opinions of Emu rearers on certain aspects by asking related questions. The questions were framed to know (a) whether they faced difficulty in disposing Emu products in time (b) whether they suffered default in payment by their buyers (c) whether they felt that Emu farming prospects were not as bright as they thought (d) whether their business inspired the neighbours to take on Emu farming (e) whether they felt that their business was at the mercy of buyers (f) whether they considered the returns satisfactory (g) whether they ever felt that there was a better option for them than Emu farming (h) whether they would happily recommend Emu farming to others. Both the large farm operators expressed that they never faced any problem in disposing Emu products as they had smooth business relations with the buyers from the neighbouring states. These two units also did not suffer the default in payment by their buyers. These two units felt that the business prospects of Emu farming were certainly as bright as they thought. The large units did not admit that they were carrying their business at the mercy of buyers, which indicated that they could find alternative domestic markets if the situation warranted. Further, neither large firm felt that it had better option for investing the money put into Emu farming. This is in line with the feeling of the large

units that their returns from Emu farming were quite satisfactory. In view of the above, both the units expressed that they would recommend Emu venture to their friends and relatives. However, only one operator opined that his business inspired the neighbours to start Emu enterprise.

The opinions of small Emu entrepreneurs presented in the above table indicate that all the ten respondents expressed that they did not have difficulty in disposing of their eggs; they did not suffer from any default in payment by their buyers and they did not feel that they missed better opportunity of investing their money. These observations highlighted the fact that the small Emu rearers had assured market for eggs with the large units; the large units which bought the eggs were prompt in payment and the small units made more profits from Emu farming than what they could get from alternative propositions. It was for this reason that all the small farmers felt that their returns from Emu farming were quite satisfactory. However, it may be noted that all of them felt that they were running the business at the mercy of large rearers, who bought their eggs. This particular observation pointed out that small units had no alternative markets which they could depend upon. Inspite of steady and good returns from Emu farming, a majority of small rearers (70 per cent) expressed that their business activities did not motivate the neighbours to start Emu farming. Also 60 per cent of them were hesitant to recommend Emu farming to their friends and relatives. This clearly pointed out that the small farmers were always concerned about the future prospects of the business, as they were solely depending on a few large rearers for marketing of eggs. The feeling of uncertainty among the small rearers can also be inferred from the response of 50 per cent of them that Emu farming was not as bright as they thought.

SUMMARY AND POLICY IMPLICATIONS

Agriculture plays an important role in the Indian economy. From time immemorial, agriculture has occupied a pivotal position in India's economic development and it has been regarded as a major economic powerhouse that has a bearing on the whole economy. It has been realized that the success of economic planning in India largely depends on the growth of agricultural sector.

Agriculture and livestock are inter-dependent in our economy and livestock has been recognized as an important approach for sustained livelihood. Livestock activities provide manure and drought power required for agriculture in addition to contributing the products like milk, meat, eggs etc, while the crop residues form the major source of feed to livestock and this system of interdependence has sustained for centuries. Livestock are important sources of income and employment in rural sector. They help to meet the equity objective in rural development through their contribution to the cash income of small and marginal farmers and landless labourers. India has made remarkable stride in the area of livestock population in the world. Animal husbandry has been an inseparable part of human civilization and culture from the very ancient period. It is also emphasized in Vedas and Puranas that possessing livestock is a symbol of prosperity. In India, no problem is as grave and alarming as that of unemployment. Poverty and unemployment coupled with glaring inequalities of income and consumption constitute a big challenge to economic development. In this context, a relatively recent addition to animal production activities in India that holds the promise of stable income and gainful employment is that of Emu rearing.

Emu (pronounced E-moo in the United States or E-mew in Australia) is the second largest flightless bird under the group ratites. Emu is scientifically classified as Dromius Noveahollandiae. It is comprised of three sub species which are inter breeding in the wild as well as on farms. These are Dromaius novaehollandiae novaehollandiae, Dromaius novaehollandiae woodwardi and Dromaius novaehollandiae rothschildi. The Emu is originally from Australia and is in the ratite family of birds. There are only five birds in the ratite family, the ostrich, emu, cassowary, rhea and kiwi. 'Ratite' has Latin root meaning raft. This is so because of their breastbone, which is flat. There is no breast meat like in chicken, which has a keel type breastbone. Because of this flat breast bone, ratites do not fly. Aborigines in Australia utilized these birds for their basic needs like food, clothing and for treatment. It is a sober bird living on grains. Its immune system is so strong that it hardly suffers from any disease. It survives in any type of climate. Each and every part of the bird has commercial values.

Businesses such as poultry, dairy, sheep or goat raring often suffer due to various factors such as eruption and spread of infectious and contagious diseases, climatic changes, excessive heat and scarcity of water resulting in sudden fall in production. Emu is naturally immune to all these adversities. Hence, Emu farming is preferred all over the world today. Emu farming as complementary to agriculture is going to be a profitable venture.

In India, an Emu farm by name Vijaya Ratite Farm (Pvt.) Ltd. was established by Shri P. Satyanarayana in Andhra Pradesh in 1996. Similarly, in Maharashtra state, Shri. Ganesh Kale & Group introduced 20 pairs of Emu during 2001. In Baramati, Shri. Sandip Taware established first Emu Farm with 10 pairs in April 2002. Emu farming in India is presently concentrated in Southern States. Farmers buy birds from big breeders and have option of becoming self sustained breeders to produce chicks for sale, or integrated farmers to sell hatching eggs back to the integrators. The sale of Emu products in India is yet to take shape due to lack of awareness and non-availability of sufficient emu population.

Present estimate of Emu population in India is above two lakhs. The biggest Farm is located in Andhra Pradesh with 6000 Emus at one place. Vijayawada, West Godavari, Hyderabad, Chittoor and Nellore in Andra Pradesh; Coimbatore, Namakkal, Erode and Hosur in Tamil Nadu; Bangalore, Mysore, Gokak, Hubli etc in Karnataka; Pune and Nasik in Maharashtra are major production belts for Emus.

The Government as per 1972 Forest Animal Husbandry Act for protection and rearing of forest animals, has permitted Emu farming, which offers great opportunity for foreign investments and export. Emu farming is a big venture with a huge growth potential. Emus are tough birds and are even immune to bird flu, but have to be protected from other specific diseases including encephalitis. With a little effort, Emu farmers can sit back and count their money, if they get together to promote Emu meat in households as well as hotel menus. Due to growing awareness of eating healthy, Emu meat has started getting into demand in India too. With the increasing acceptability of alternative medicines, Emu oil containing the pain-relieving oleic acid believed to be good for arthritis, has a huge

commercial potential. Leather products from Emu skin, made on a pilot basis by the Central Leather Research Institute, were showcased at Delhi's Pragati Maidan some years ago to a great acclaim by the visitors.

In Karnataka, Rangrej Emu Farm is one of the pioneers in starting of emu farms in Karnataka. They started farming in 2003 and currently have more than 800 birds at the farm which is spread across more than three acres at Bangalore. Fongeee Emu farm, Sai Emu farm, and Tall bird Emu farms have sub units of both large scale and small scale farming in different locations in south Karnataka places. Presently, there are about 200 farms in Karnataka with more than 2.5 lakhs of birds. Hubli, Bagalkot, Jamakandi, Koppal and Gokak are important locations in north Karnataka, where Emu farming in large scale can be seen.

Not much work has been done on the management and economic aspects of Emu farming. This activity which has a great potential for income and employment generation at commercial as well as small scale needs to be investigated. The present study is an attempt in this direction. This study is proposed to address the business activities of emu farming in Dharwad district, which is the major Emu farming district in North Karnataka. The present study was conducted with following objectives:

1. To study the socio-economic conditions of farmers engaged in Emu farming.
2. To study the investment pattern for Emu farms.
3. To analyse the business performance of Emu farms.
4. To study the existing marketing arrangements for Emu farming products.
5. To analyse the problems encountered in production and marketing of Emu products.

In consultation with the operators of Emu rearing units and experts in livestock industry, it was found that there are totally 13 Emu farming units in Dharwad district. The present study considered 12 units for analysis. However, since the number of birds varied widely across these 12 units, they (units) were classified into small and commercial units. For the purpose of classification Emu units with more than 25 pairs of birds were considered as the commercial units and those with 25 pairs or less were considered as small units. Based on this criterion 10 out of the selected 12 units in the district turned out to be small units, while the remaining two were identified as the commercial units.

The present study relied on primary data collected from Emu farm operators. The data pertaining to their socio-economic status, cost of production, returns, marketing arrangements, awareness about Emu birds and problems faced in production and marketing of emu birds were collected from Emu farmers through personal interview method using pre-tested schedule. The tools and techniques employed in the study area were tabular analysis and financial feasibility analysis.

FINDINGS OF THE STUDY

1. The findings pertaining to socio-economic conditions of farmers engaged in Emu farming revealed that a majority of the small farmers engaged in Emu rearing were aged between 35 and 50 years. While one large Emu rearer was relatively young (less than 35 years), the other was relatively aged (more than 50 years). In respect of educational level of Emu rearers, it was clear that both the large rearers had education beyond primary level. Among the small rearers, only one (10 per cent) was illiterate. 80 per cent of them had education beyond primary level, with 50 per cent of them having college education. This observation, in particular indicates that the farmers engaged in Emu rearing are well educated in general. It was also indicated by the results that a majority of the small rearers (70 per cent) had medium sized families (4-8 members). In the case of large rearers, one had small family, while the other had medium sized family. Interestingly, Emu farming was the main occupation for all the large and small rearers. Both the large rearers had other agricultural activities as well as non agricultural activities as subsidiary occupation. Similarly, all the ten small rearers had subsidiary occupation in the form of other agriculture and allied activities; six of them had subsidiary activities in non agricultural sector. Both the large Emu rearers had annual income of more than ₹ 10 lakhs. However, no small rearer had annual income of this magnitude. The annual income of a majority of small rearers (80 per cent) ranged from ₹ 5 to 10 lakhs.
2. The investment pattern in large scale Emu farms revealed that cost of the birds (₹ 90,00,000) had a lion's share (92 per cent) in the total investment cost of the unit (₹

97,87,800). The outlay for birds was huge since the cost of a pair of two year old birds normally bought to set up Emu farm was very high at ₹ 30,000.

3. In the Investment pattern for small scale Emu farms, cost of the birds was the largest component of the total investment expenditure of ₹ 9,41,140. Specifically, the cost of the birds amounted to ₹ 7,50,000, which formed 79.7 per cent of the total investment expenditure.

4. The findings relating to the costs and return in large scale Emu farm per annum revealed that the total cost incurred for the Emu farm with 300 pairs of birds was ₹ 43,05,552. This was composed of the total variable costs amounting to ₹ 35,37,570 and total fixed cost amounting to ₹ 7,67,982. With regard to the returns, it can be seen from the table that the sale of eggs, chicks and manure fetched an annual return of ₹ 1,46,89,000. The returns from eggs at the rate of₹ 1500 per egg were the most important source of revenue forming 73.5 per cent of the total returns. This was followed by the return from the sale of chicks (₹ 2500 per chick) which stood at 24 per cent of the total return. The return from the sale of manure, which amounted to ₹ 64,000 was the smallest component of total returns of ₹ 1,03,83,448. The large farm, as a result, earned the net returns of ₹ 1,03,83,448 per annum.

5. With respect to small farms, it was found that the total cost of farming per annum was ₹ 4,20,669. This was made up of fixed costs of ₹ 81,730 and variable costs of ₹ 3,38,939. The small Emu farms did not rear chicks. As such, the income from farming for small farms consisted of the revenue from the sale of eggs and manure. In the total returns ₹ 9,95,000, the return from the sale of eggs had a huge share of 98 per cent. The remaining share of two per cent was that of manure. The annual net returns for the small farm with 25 pairs of birds was ₹ 5,74,331.

6. The large size Emu project would be highly feasible based on each feasibility criterion computed. The NPV would be as large as ₹ 8,60,90,543. This implied that the wealth of the entrepreneur undertaking this venture would increase by around ₹ 8,61,000,00. The benefit cost ratio of 9.79 indicated that each rupee invested in large scale Emu farming would yield net cash flows of ₹ 9.79. Further, the IRR of 70 per cent was much larger than the cost of capital (9 per cent) implying that it was worthwhile to invest money in Emu enterprise. The payback period of 2.25 years indicated that the project would generate enough returns to recover entire initial investment in just 2.25 years.

7. For conducting sensitivity analysis, five scenarios of adverse movements in egg and chick prices were created in comparison with the base year assumption of five per cent annual growth in egg and chick prices throughout the project period. Scenario -1 indicated only three per cent growth in egg and chick prices instead of five per cent growth. This scenario resulted in NPV of ₹ 7,16,19,882, B-C ratio of 8.31, IRR of 67 per cent and payback period of 2.43 years. Scenario -2 showing one per cent growth in egg and chick prices would still lead to substantially high NPV (₹ 5,91,81,944), B-C ratio (7.04) and IRR (64 per cent). Payback period would be just 2.5 years. Scenario -3, 4 and 5 indicated negative growth in egg and chick prices. Scenario 3 which stood for -1 per cent growth in egg and chick prices, would still result in high NPV, B-C ratio, IRR and a comfortable payback period of just 2.65 years. In the present sensitivity analysis, scenario -5 represented the most adverse changes in egg and chick prices, which would show -5 per cent growth. Even in this scenario, the NPV would be more than ₹ 3,00,00,000 and B-C ratio would be more than four implying that each rupee invested would return a net cash flow of ₹ 4.19. The IRR would also be high at 54 per cent. The entrepreneur would recover entire investment in just three years.

8. In small scale Emu farming units, the estimated NPV implied that the entrepreneur taking up small scale Emu farming with 25 pairs of birds would evidence an increase in his wealth to the extent of ₹ 47,16,840. The B-C ratio of 6.11 implied that the benefit for every rupee invested in the business would be to the extent of ₹ 6.11. The IRR at 49 per cent was much above the cost of capital at 11 per cent. All these three measures established the financial feasibility of the small scale Emu farm. Also, the payback period was highly encouraging in that it indicated that the entire initial investment would be recovered in less than three years.

9. A sensitivity analysis was carried out for small scale Emu farm also as in the case of large scale Emu. Here also, five scenarios of growth in egg prices were created, which represented the growth in egg price at less than five per cent, the rate assumed in the base scenario. The growth rate in egg price represented by scenarios 1 to 5 were 3 per cent, 1 per cent, -1 per cent, -3 per

cent and -5 per cent in that order.The NPV's projected under scenarios 1 to 5 were ₹ 37,51,804; ₹ 29,22,284; ₹ 22,07,586; ₹ 15,91,196 and ₹ 10,57,617. This clearly indicated that the project would be financially feasible even under the worst scenario assumed in this analysis (-5 per cent growth in egg prices) as the NPV would be still a huge positive number of ₹ 10,57,617. Similarly, the benefit cost ratio would be 4.98 in the first scenario and 2.12 in the worst scenario indicating that each rupee invested could get the entrepreneur a net cash flow of ₹ 2.12, even if the egg prices declined at 5 per cent. The internal rate of return also established the financial feasibility of the project as it would be 30 per cent in the worst scenario far exceeding the cost of capital. Finally, the payback period would also be comfortable as per the sensitivity analysis. Even assuming that egg price would fall by five 5 per cent, the project would pay for itself in just 3.15 years.

10. The marketing arrangements of large and small Emu farms were analysed in the present study. With regard to the products sold, it can be seen from the results that large farms sold eggs, chicks as well as manure. It may be noted that the large Emu farms procured Emu eggs from small farms. While selling all the eggs procured from small units, the large units sold only 80 per cent of the eggs produced on their farms. The remaining 20 per cent eggs produced on the farm were used for hatching, and all the hatched chicks were sold. It was observed that these large units applied 20 per cent of the manure produced on their farms and sold out the remaining 80 per cent to the neighbouring farmers. Both Eggs and chicks were disposed by these units on the farm itself to the buyers from other states like Andra Pradesh, Tamil Nadu and Kerala. As for the prevailing practices, the buyers bear the transportation and packing cost. As such, the large units bear the cost of trays and other packing charges as well as the transportation charges to carry the eggs from the small farms to their establishment. Similarly, the buyer from Andra Pradesh, Tamil Nadu and Kerala visiting the large farms for the purchase of eggs and chicks take care of all the packing and transportation expenditure. In respect of manure also, the buyer from the neighbouring farmers take care of this expenditure.

    There is no contractual agreement between the buyers and sellers of eggs and chicks with regard to the prices. As such, these prices are determined based on the market conditions of supply and demand. Presently, price of three month old chicks ranges between ₹ 2500 to ₹ 3000 per pair and that of eggs sold by large farms ranges between ₹ 1400 to ₹ 1600. There is no system of credit sales, and all transactions are carried out in cash.

11. Marketing arrangement of small scale Emu units reveals that the small units sell only eggs and manure. All eggs are sold to the large units at Hubli and Sulla. In the case of manure, the small units retain 40 per cent for on farm use and sell the rest to the neighbouring farmers. The buyers of the eggs and manure visit the Emu farms and pick the material from there. The cost of egg trays, other packing charges and transportation cost is entirely borne by the buyers. Similarly, all the costs incurred in lifting and transporting the manure is met by the purchasers. As mentioned above, egg prices are not determined in advance and are subject to market fluctuations. Presently, the prices at which the small farmers sell their eggs to the large farmers range between ₹ 1200 to ₹ 1400 per egg.

12. The production related problems faced by Emu units are high initial investment, mortality of birds, non availability of vaccines and veterinary aids, electricity failure and maintenance of incubator. In respect of small Emu units also high initial investment was the most significant problem as this problem was pointed out by all the ten units.

13. The marketing problems analysed in respect of ten small scale units and two large scale units are identified in consultation with small and large Emu rarers were eight in number. They were: a) absence of local demand for Emu eggs or meat b) complete reliance only on a few buyers c) lack of knowledge about the alternative domestic markets for Emu products d) absence of information on export avenues and agencies e) wide fluctuation in manure price f) absence of institutional arrangements for dissemination of market information g) fear of losing patronage of regular buyers of eggs and chicks and h) non existence of Emu products processing facilities. It was interesting to note that all the ten small emu farms faced each one of these problems. The situation, however, was different in the case of large units. Neither of the two units faced problem of lack knowledge of alternative domestic market for selling Emu products; nor had they any fear of losing their regular buyers. However, the absence of local demand for Emu eggs and meat, absence of institutional arrangements to disseminate market information and non existence of Emu processing facilities were the problems for both the large units. The other problems of

reliance on a few buyers, absence of information on export market and fluctuation manure prices were experienced by only one of the two large units.

14. An effort was made to collect the opinions of Emu rearers on certain aspects by asking related questions. The questions were framed to know (a) whether they faced difficulty in disposing Emu products in time (b) whether they suffered default in payment by their buyers (c) whether they felt that Emu farming prospects were not as bright as they thought (d) whether their business inspired the neighbours to take on Emu farming (e) whether they felt that their business was at the mercy of buyers (f) whether they considered the returns satisfactory (g) whether they ever felt that there was a better option for them than Emu farming (h) whether they would happily recommend Emu farming to others. Both the large farm operators expressed that they never faced any problem in disposing Emu products as they had smooth business relations with the buyers from the neighbouring states. These two units also did not suffer the default in payment by their buyers. These two units felt that the business prospects of Emu farming were certainly as bright as they thought. The large units did not admit that they were carrying their business at the mercy of buyers, which indicated that they could find alternative domestic markets if the situation warranted. Further, neither large firm felt that it had better option for investing the money put into Emu farming. This is in line with the feeling of the large units that their returns from Emu farming were quite satisfactory. In view of the above, both the units expressed that they would recommend Emu venture to their friends and relatives. However, only one operator opined that his business inspired the neighbours to start Emu enterprise.

POLICY IMPLICATIONS

1. Cost return analysis of Emu farming revealed that profits were quite high from the enterprise. However, heavy dependence on a few buyers, lack of knowledge about alternative markets and absence of processing facilities make Emu farming very risky, especially for the small rearers. Thus, any decision to start this venture needs to be made with a lot of caution and after ensuring marketing avenues.

2. It is widely believed that Emu products, especially eggs and meat have good export demand. However, the information pertaining to the export avenues and export agencies was missing among the sample respondents. To make Emu farming a reliable venture and to sustain its income in the long run, institutional efforts are required for dissemination of market information relating to Emu products both in domestic and foreign markets.

3. It was invariably expressed by all the respondents, whether small or large, that their products did not find local demand. It is found that Emu eggs have less saturated fat than chicken eggs and Emu meat has less cholesterol than chicken meat. As such, these Emu products are believed to have many health benefits. Thus, efforts are needed to popularise these products among the public, and create good domestic market for Emu industry.

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BUSINESS PERFORMANCE OF EMU FARMING IN DHARWAD DISTRICT

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ABSTRACT

Emu farming activity which has a great potential for income and employment generation at commercial as well as small scale level. In India not much work has been done on the management and economic aspects of Emu farming. The present study is an attempt in this direction. This study is proposed to address the business activities of Emu farming in Dharwad district, which is the major Emu farming district in north Karnataka. The present study relied on primary data collected from Emu farm operators. The data pertaining to their socio-economic status, cost of production, returns, marketing arrangements, awareness about Emu birds and problems faced in production and marketing of Emu birds were collected from Emu farmers through personal interview method using pre-tested schedule. The tools and techniques employed in the study area were tabular analysis and financial feasibility analysis.

The results showed that the investment on large units was higher (₹ 97,87,800) as compared to small units (₹ 9,41,140). The cost involved in large and small units were ₹ 43,05,552 and ₹ 4,20,669 respectively. Around ₹ 1,03,83,448 and ₹ 5,74,331 of net returns were obtained from both large and small rearing units respectively. The financial feasibility analysis on investment in Emu farming had indicated that the investment on business is financially feasible and economically sound, as the NPV for large unit and small unit were ₹ 8,60,90,543 and ₹ 47,16,840 respectively. Benefit-cost ratio of large unit was found to be 9.79 and in case of small units it was 6.11. The internal rate of returns in both large and small units were 70 percent and 49 percent respectively. The payback period were 2.25 and 2.73 years in large and small Emu rearing units. The major problems observed in rearing were absence of local market, non existence of Emu products processing facility and absence of institutional arrangements for dissemination of market information.