

A Comprehensive study on the issue of coconut production in Karnataka

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Report Submitted

To

Directorate of Economics & Statistics, Department of Agriculture, Cooperation &
Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India,
New Delhi

February, 2019

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ACKNOWLEDGEMENTS

I am extremely grateful to the Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India, New Delhi, for financing this study titled "A Comprehensive Study on the issue of coconut production in Karnataka". I am very thankful to the Director of ISEC Professor M.G Chandrakanth for encouraged me to work on this project. My special thanks to Prof. Parmod Kumar, who helped me at various stages of this project. Further I thank to all my colleagues in the ADRTC for their unstinted help.

I am very thankful to Horticulture department staff provided valuable suggestion in Gubbi Taluk in Tumakuru district; Chennarayapatna Taluk in Hassan district, and Hiriyuru Taluk in Chitradurga district.

I thank all respondents who have responded immediately and spared their valuable time. My sincere thank to the investigators who worked on this project. I am thankful to Dr.Yogesh M S, Research Associate, Raviteja J N, Research Associate, Indiraji K N, Research Assistant, Sindhu M, Research Assistant, Mr. Narasimha Murthy, Research Assistant, Kavita S Naik, Research Assistant and Mr. Shivakumar G, Field investigator, for their help in collection of primary data and entry of data.

The secretarial assistance by Mr. Vijay N Malave (Senior Assistant), and Mr. Muthuraja is thankfully acknowledged.

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EXECUTIVE SUMMARY

Background

The Indian agriculture sector occupies an important place in Indian economy. Government of India (2016) published "State of Indian Agriculture 2015-16" and mentioned the importance of agriculture sector in India. The agriculture and allied sector contribution of production, employment and exports growth rate is increasing constantly. At the same time, the contribution of agriculture in GDP is continually declining due to service sector and manufacturing sectors are contributing significant growth. According to Gol (2016) report, the agriculture and allied sector contributed 14 per cent to the GDP during 2013-14. According to Sathya and Muruges (2015) India is the second largest producer of coconut in the world; contributed 24.24 per cent in production, first in productivity and third in area under cultivation (16%). As for Government of India is concerned, the total India's coconut area was 2088.47 thousand hector under coconut cultivation, 22167.45 million of nuts produced and productivity nut per ha.10614 in 2015-2016 (Coconut Board). Among the states in India, Kerala achieved first place in terms of cultivated area which was 770.62 ha and the share of Kerala in all India is 36.9 per cent, Karnataka state obtained second highest area (526.38 Ha.) and share in all India is 25.2 per cent during 2015-16. The coconut farmers are facing problems in India in general and particularly in Karnataka state. In addition to that, what are the features of the coconut farmers in Karnataka is brought into this study.

The cultivation of coconut crop is gradually increasing in Karnataka state. Through coconut crop, large people are getting direct or indirect employment. Every part of the coconut tree is useful in economic perspective. For example; the coconut tree gives neera, tender coconut, dry coconut, copra, leaves, trunk is also useful one or the other purpose. Due to these reasons, Borkar Prema (2015) mentioned that, in India, most of the people treat coconut tree as a "Kalpavruksha" or tree of life. The coconut area about 90 per cent comes from southern states, viz Kerala, Karnataka, Tamil Nadu and Andhra Pradesh.

Objectives

The Karnataka state occupied third position in terms of coconut production in all over India. In Karnataka most of the people treat coconut tree as a “Kalpavruksha” or tree of life. In Karnataka state almost all districts are cultivating coconut crop.

With this background, the study addresses following explicit objectives:

- To investigate growth of Area, Production and Productivity of coconut cultivation in Karnataka
- To study the socio-economic profile of coconut farmers' in selected households.
- To analyze the cost of cultivation and estimate the profitability in coconut cultivation in Karnataka
- To study the problems and prospects of coconut cultivation in Karnataka.
- To recommend suitable policies to the coconut cultivators to overcome their problems.

Data and Methodology

The study pertains to the Karnataka state. The study is following suitable methodology and technique to collect the needful data for the analysis of both quantitative and qualitative information. The study also focused on the secondary data to provide background insights on the coconut cultivators in India in general and particularly in Karnataka state. Primary survey is adopted. The sample respondents used based on purposively sampling technique. In the first stage three districts (Tumakuru, Hassan and Chitradurga) selected where the coconut cultivated area was higher over period of time (nearly 15 years). In second stage, in each district two villages selected. And in final stage, in each village 40 coconut households were selected (except Malenahalli-44 and Nambihalli-36). At the time of field visiting, due to lack of sufficient coconut farmers in Nambihalli, the study selected 36 coconut farmers' households, to cover rest of the (4 households) coconut farmers, the study considered another study village Malenahalli, covered 44 coconut households. According to methodology, our study wanted to select in every district 80 coconut farmers. So, here we covered total 80 households in Tumakuru, Hassan and Chitradurga districts. The study considered in each district 80 samples representing and the total sample size is 240. The primary study period is from 1st July, 2017 to 30th June, 2018. The field work was completed in the month of July-August, 2018.

Findings

- The Karnataka state coconut crop area share was increased from 18 per cent in 2000-01 to 25 per cent in 2015-16.
- The Tumakuru district share of production in Karnataka is higher among the 30 districts in Karnataka and followed by Hassan and Chitradurga. But the Tumakuru district share of production in Karnataka state gradually declined from 37.64 per cent in 2000-01 and 32.66 per cent in 2014-15.
- Among the sample villages, OBC are higher in Nambihalli (88.89%) village, followed by Parabhavanahalli (78%). Among the social groups SCs are very less in cultivation of coconut crop.
- Few (12%) of the coconut farmers insured their crop during study period. The bankers (26) suggested to farmers to insure their coconut crops for future crop loss purposes.
- The main reasons for not insuring coconut crops are: Farmers are not interested, followed by lack of awareness, don't know policy information and no trust on insurance companies.
- Land is very important production asset for rural people. The average owned land is higher in Chitradurga district (7.65 acres). In similar way, the average owned land is higher in Alur village (9.26 acres).
- The main irrigation source of the farmers were tube well (75%), followed by canal (4%), open well (3%), tanks (1%), others (1%). Some of the farmers were used two irrigation sources.
- Half of the farmers land soil quality is good (51%), followed by average (48%) and poor (1%).
- The agricultural income contributed in significant manner among the activities. Among the activities, the highest average income comes from agricultural sector in Vadaluru village (₹.4,45,975) and the lowest income from Malenahalli village (₹.89,227). The share of agriculture income is higher in Chitradurga (92%) district. The highest second income

comes from service sector (7%), followed by dairy & animal husbandry (3%), other sources (1%) and self business (0.46%).

- The institutional average borrowed loan amount is higher in Chitradurga (₹.1,31,750) district. At the same time, the institutional borrowed amount is higher in Alur (₹.1,96,250) village. The average outstanding amount is higher in Chitradurga (₹.1,28,625) district. In similar way, among the villages, the outstanding average amount is higher in Allur (₹.1,95,000) and the lowest outstanding amount comes from Parabhavanahalli (₹.34,375). At the time of our study, only six farmers repaid full loan amount and remaining coconut farmers due is still pending.
- Very few of the coconut farmers borrowed money from land lords (10), Money lenders (10) and others (23) and these are all from non-institutional sources. For agriculture purpose all farmers took loan.
- In study area, the total cultivated land is 964 acres and 38,908 coconut trees were grown at the time of our study in all selected villages. The coconut average land is higher in Tumakuru (4.78 acres) district, followed by Chitradurga (4.82 acres) and Hassan (2.45 acres). Village wise, the average coconut land is higher in Alur (5.74 acres) village, followed by Parabhavanahalli (4.88 acres), and Vadaluru (4.69 acres).
- Nearly 95 per cent of the farmers received production during study period, whereas five per cent of the farmers were not getting production due to coconut trees not reaching yield stage.
- The copra net returns (income) are higher in Tumakuru district (₹.3,21,791) and village wise, the highest net returns received is by Parabhavanahalli (₹.4,12,171) village.
- There are a lot of average income differences among the farmers. The large farmers' average income is higher than the other farmers. And the large farmers' highest average income comes from Tumakuru (₹.8,31,540) district. Village wise Vadaluru (₹.9,76,000) farmers' average income is higher. All coconut farmers earned income but large farmers earned more profit as compared to marginal, small and medium farmers.

- Coconut farmers reported that seedling cost (38), diesel charges (93), water charges (26), fertilizer (166), pesticides (58), manure (6), technical labour (219), other labour (107) and transportation (33) charges increased over past five years.
- Firstly, very few (3%) of the farmers faced lack of quality of seedling during cultivation of their coconut crops in study period. Secondly, few (5%) of the farmers expressed that they want better varieties and more yield seeds.
- Nearly 40 per cent of the farmers informed that they faced weather problem and 52 per cent of the coconut farmers faced water problem during study period. In our study results shows that the coconut farmers faced many diseases, problems and affected main diseases are: Pests and disease (68%), tatipaka (3%), thanjaw wilt (36%), bud rot (9%), lethal yellowing (48%) and nusi roga (24%).
- Majority (68%) of the coconut farmers were not having shed facilities. Because of this reasons farmers had to sell their coconut production immediately. Due to this reason, some of the coconut farmers were getting low prices/income.
- Nearly 27 per cent of the farmers informed that there was a middlemen problem in their places. Infrastructure is very important for the rural people for going from one place to another place. Our study results reveal that 15 per cent of the coconut farmers informed that there was a transportation problem in their place.
- Due to lack of sufficient water, yields declined in study areas. Nearly 64 pr cent of the coconut farmers reported that they did not get extension services.

Policy suggestions

- To cultivation of coconut crop land played a key role, in addition to that, financial background is required. Due to lack of financial support, SCs were unable to cultivate coconut crop more in selected villages. To inclusive (SCs farmers') growth, Government of Karnataka has to provide some intensive facilities to them. Therefore, social imbalances will reduce in selected villages.
- Majority (68%) of the coconut farmers were not having shed facilities. Because of this reason farmers had to sell their coconut production immediately. Due to this reason, some of the coconut farmers were getting low prices/income. To avoid the loss, government will provide some subsidies to construct the shed for coconut farmers.
- Nearly 27 per cent of the farmers informed that there was a middlemen problem and broker problem in their places. To avoid middlemen/broker, if possible, government has to provide alternative facilities to the coconut farmers.
- Marginal and small farmers earned less profit as compared to large farmers. To inclusive growth of marginal and small farmers', government has to provide some technical/financial/extension/ facilities to the marginal and small coconut farmers.
- Some of the farmers are facing disease problems to avoid the diseases, study suggested that to control the disease holistic pest management techniques should be approached. Our study suggested that the capacity building programmes should be conducted for coconut farmers; therefore, farmers are able to know updated skills.

Chapter 1

INTRODUCTION

1.1. Background

The Indian agriculture sector occupies an important place in Indian economy. Government of India (2016) published "State of Indian Agriculture 2015-16" and mentioned the importance of agriculture sector in India. The agriculture and allied sector contribution of production, employment and exports growth rate is increasing constantly. At the same time, the contribution of agriculture in GDP is continually declining due to service sector and manufacturing sectors are contributing significant growth. According to Gol (2016) report, the agriculture and allied sector contributed 14 per cent to the GDP during 2013-14. According to Sathya and Muruges (2015) India is the second largest producer of coconut in the world; contributed 24.24 per cent in production, first in productivity and third in area under cultivation (16%). As for Government of India is concerned, the total India's coconut area was 2088.47 thousand hectares under coconut cultivation, 22167.45 million of nuts produced and productivity nut per ha.10614 in 2015-2016 (Coconut Board). Among the states in India, Kerala achieved first place in terms of cultivated area which was 770.62 ha and the share of Kerala in all India is 36.9 per cent, Karnataka state obtained second highest area (526.38 Ha.) and share in all India is 25.2 per cent during 2015-16. The coconut farmers are facing problems in India in general and particularly in Karnataka state. In addition to that, what are the features of the coconut farmers in Karnataka is brought in to this study.

The cultivation of coconut crop is gradually increasing in Karnataka state. Through coconut crop large people are getting direct or indirect employment. Every part of the coconut tree is useful in economic perspective. For example; the coconut tree gives neera, tender coconut, dry coconut, copra, leaves, and trunk is also useful for one or the other purpose. Due to these reasons, Borkar Prema (2015) mentioned that, in India, most of the people treat coconut tree as a "Kalpavruksha" or tree of life. The coconut area about 90 per cent comes from southern states, viz Kerala, Karnataka, Tamil Nadu and Andhra Pradesh.

The cultivation of coconut area is increasing gradually in Karnataka state due to increasing net returns. Initially in Karnataka state, few districts cultivated coconut crops, but presently almost all 30 districts are cultivating coconut crop. Among the 30 districts, Tumakuru, Hassan and Chitradurga districts contributed more area in Karnataka state and this information is furnished in further chapters. Even though coconut farmers are facing little problems in major districts (Tumakuru, Hassan and Chitradurga), but the net returns are more in coconut farmers as compared to other farmers. Coconut farmers' net returns details are furnished in the coming chapters. The coconut production is gradually increasing from year to year.

The Karnataka state contributed significantly to coconut area, production and productivity in India; in addition to that, some districts of Karnataka are more suitable for cultivation of coconut and other crops. Some of the eminent people have done research on coconut area, production and productivity, and literature is furnished in the review of literature part.

1.2. Review of literature

According to Nampoothiri (1999) coconut palms were divided into two groups, the tall and dwarfs. In general, the tall cultivators are available in the entire world. In the world, most of them are tall cultivators as compared to dwarfs. By nature, dwarfs are shorter and life span is also low as compared to Tall. The author stressed the importance of irrigation or water supply to the coconut crops and the distribution water is very essential to coconut.

Rajendran (2002) examined in coconut neera, and it is generating income to the farmer. The coconut gives neera continuously at least six months, after that it gives tender coconut. In Karnataka state, some places farmers are openly selling the coconut neera and this was the major economic activity in the districts like Hassan, Tumakuru, Chamarajanagar, Mandya, Shimoga and Mysuru. The coconut trees are having life span of nearly 60 to 100 years, in addition coconut cultivation is a labour intensive and it cultivates inter crops. In Karnataka state some large farmers are leasing their coconut trees for years and getting an average of ₹.1000 to ₹.2000 for collection of neera and this is higher in Mandya and Chamarajanagar in southern Karnataka.

Siju et al., (2005) aim of the study is to know the stability of coconut cultivators for dry matter and yield characteristics at two different agro climatic regions in India. According to author, environmental factors like rainfall, temperature, relative humidity, solar radiation and other soil factors influence coconut plant growth and productivity. The study collected data from two agro-climatic locations: Kidu, Dakshina Kannada district, Karnataka selected in Western Ghats location; and Veppankulam, Thanjavur district, Tamil Nadu selected from eastern coastal plains -hot sub humid region. The study finds that, coconut cultivators grown at Veppankulam region are superior in dry matter production and nut yield. Secondly, in all prospects, local tall cultivators (Kidu) performed better at western ghats-hot sub humid per humid region. The study identified that both regions produced higher nut yield over study period.

Lathika and Ajith (2005) examined growth trends in coconut area, production and productivity for the last five decades in Indian states. The author emphasized on coconut production and area and yield in coconut. The study used secondary data, area, production and productivity in coconut crop. The study covered coconut produced States/Union territories in India and study period from 1950-51 to 2001-02. The author finds that coconut area affected due to weather conditions in all over regions.

Acharya et al., (2012) focused on area production and productivity in major crops in Karnataka state. The Karnataka state is having different agro-climatic conditions which is helpful to the farmers to cultivate different crops in their locations. The study emphasized all major crops in Karnataka state. The study estimated compound growth rates in all major crops and study covered during 1982-83 to 2007-08. The study finds that the coconut production increased per annum about 1.95 per annum. The increase in growth of coconut is cause of increase in area.

Sudha (2012) explored production analysis of coconut and areca nut in Tumakuru district in Karnataka state. The coconut trees are an important income source of rural people. Tumakuru is the largest producer in the state. The study used secondary data, from 1981 to 2009. The study focused on area, production and productivity of coconut and areca nut. The study divided into three decades; first decade covered from 1981-1990; second decade 1991-2000 and third decade from 2001-2009. The major findings of the study are: areca nut area and production increased 98 per cent as compared to coconut crop in third decade. The trend

analysis shows that the increase in production is because of increase in area and productivity. The decomposition analysis explored that the coconut productivity of growth was improved in third decade at the rate of 38 per cent as compared to first decade (five per cent). The main reason for increase in production is due to increase in area and under coconut crop. In second decade, coconut production was not much changed and third decade increased very significantly due to increase in area.

Priyadarshini (2013) explained about Karnataka state and relevance of the resources in the state. The objectives of the study are; firstly, to assess the trend in area and production of coconut crop in districts of Karnataka; secondly to compute instability index and sustainability index for area and production of coconut crop in districts of Karnataka. And finally, to estimate the temporal variability in coconut area and production in selected districts in Karnataka. The study concerned was during 1981-82 to 2008- 2009. The study finds that there is an increase in trend area, production and productivity of coconut crop over the study periods. Secondly, during 1982-2009, the Hassan district (0.104) had low sustainability Index next by Tumakuru district (0.192) followed by Bidar district (0.215). Thirdly, during 1982-2009 Chitradurga districts (0.676) had higher sustainability index next by Tumakuru district (0.603) and Hassan district (0.506). Accordingly instability index of 11 districts are: Bellary, Chitradurga, Davanagere, Gulbarga, Hassan, Mandya, Tumakuru, Udupi, Uttara Kannada, Chamarajanagar, Dakshina Kannada and Gadag plunges under the low category, it shows lower variation in the production of coconut crop.

Karunakaran and Gangadharan (2014) investigated coconut cultivation in Kerala. According to authors during 1960s, 1970s and 1980s coconut crop cultivation took second place in Kerala state in terms of area expansion and after 1980s coconut area has increased to 56 per cent. The author focused on what are the determinant causes of changes in area coconut in Kerala state by adopting supply response method. The study covered 1960s to 2010. The study divided into six periods, from first 1960-61 period, second 1970-71 period; third period 1980-81; fourth period 1990-91, fifth period 2000-01 and sixth period 2009-10. The study finds that coconut production increase due to area increased. Irrigation and area are influential to increase in coconut cultivation in Kerala state. The rainfall and expected prices are the positive influence on the yield of coconut crop.

According to Sathya and Murugesh (2015) India is the second largest producer of coconut in the world; contributed 24.24 per cent in production, first in productivity and third in area under cultivation (16%). Authors were chosen for study purpose in pollachi taluk. In Pollachi majority of the farmers cultivated coconut crop. According to author, 1500 coconut growers were in Pollachi. But for the study 250 sample respondents in four regions were selected based on convenient random sampling techniques. The main findings of the study are: Most of the respondents (farmers) were given long term yield of the coconut trees. Secondly, greater parts of the coconut farmers' coconut trees were affected mostly by pests and diseases. The chosen study area's farmers were unable to get good remuneration price, due to this slowly losing the cultivation.

Kishore and Murthy (2016) observed growth in area production and productivity of coconut in Karnataka and provided suitable information in their paper. The study used secondary data from 2000-01 to 2014-15 in all districts of Karnataka state. The results reveal that, the growth rates of area, production and productivity in Karnataka state were positively increased. Tumakuru, Hassan, Chitradurga and Chikamagalur were major coconut growing districts in terms of area and production. The decrease in production and productivity because of droughts and pest and disease incidences happen after 2011-12. The state of Karnataka's coconut economy increased during the said period.

Thamban et al., (2016) provided information on management of coconut in rainy season. The study expressed that there was an under planting in coconut gardens and these led to unproductive and uneconomic to the coconut farmers. Proper drainage system should be very important for coconut garden to avoid the waterlogged conditions in the coconut gardens. Coconut farmers should be aware about several diseases like bud rot, leaf rot and root grubs in rainy season. Farmers have to take precautions over the disease. Some cases of individual farmers cannot control the fungal disease; in this case group of the farmers should adopt IDM practice to stop the bud rot in the coconut.

Naik and Nagaraja (2017) studied on coconut cultivation and marketing in Ambajipeta Taluk, East Godavari district of Andhra Pradesh. In India, there are many leading coconut producing states, among them Andhra Pradesh stands first in terms of productivity. In East Godavari, the study had chosen Ambajipeta taluk. The study collected 300 respondents from the selected area. The major findings of the study are: to increase productivity, planning should be in

proper manner, replace the old plants and cut the unproductive and disease affected plants in proper manner. The study finds that Ambajipeta plays a vital role in coconut production in East Godavari district. In the same way coconut provides more employment opportunities to rural people and it provides profit for all categories of farmers. But it is slow and it loses its position due to price not remunerative.

Anandu and Pushpa (2017) emphasized the importance of horticulture crops and their contribution of employment and income. The study used secondary data from 1975-76 to 2009-10 and considered five major coconut growing districts, namely, Tumakuru, Hassan, Chitradurga, Chikmagalur and Dakshina Kannada (DK) in Karnataka state. The study divided into three periods: Period I covered from 1975-76 to 1980-81, Period II covered from 1981-82 to 2009-10 and Period III (Overall period) covered from 1975-76 to 2009-10. The study finds that in Karnataka state during 1975-76 to 2009-10; coconut area increased significantly and production also increased in significant trend, but productivity shown slow growth. The major reason for declined productivity was higher labour cost, lack of human labour for land preparation and poor garden maintenance and not sufficient ground water and some other reasons. The study recommended that there is a need to boost productivity of coconut in Karnataka state.

Karunakaran (2017) emphasized on coconut and mentioned coconut plays a significant role in the agrarian economy of India in general and Kerala in particular. In case of Kerala, all most all districts were cultivated in coconut crop and it provided employment and income to the state economy. The author used secondary data and brought different issues in this paper. According to study, nearly 80 per cent of the coconut area accounted by small holdings, in addition to that it is growing mostly in low, middle and highlands in Kerala. The conclusions of the study are: Kerala having diverse climatic and socio-economic conditions were influenced by the cultivation of coconut crop. In Kerala, coconut farmers were facing price volatility. And the study suggested that government should provide more incentive to the coconut farmers to cultivate the coconut crops.

1.3. Objectives

The Karnataka state occupied third position in terms of coconut area and production in all over India. In Karnataka most of the people treat coconut tree as a “Kalpavruksha” or tree of life. In Karnataka state almost all districts are cultivating coconut crop.

With this background, the study addresses following explicit objectives:

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- To recommend suitable policies to the coconut cultivators to overcome their problems.

1.4. Data and methodology

The study pertains to the Karnataka state. The study is following suitable methodology and technique to collect the needful data for the analysis of both quantitative and qualitative information. The study also focused on the secondary data to provide background insights on the coconut cultivators in India in general and particularly in Karnataka state. Primary survey is adopted. The sample respondents were selected based on purposively sampling technique. In the first stage three districts (Tumakuru, Hassan and Chitradurga) were selected where the coconut cultivated area was higher over period (nearly 15 years) (Table 1.1). In second stage, in each district two villages were selected. And in final stage, in each village 40 coconut households were selected (except Malenahalli-44 and Nambihalli-36). At the time of field visit, due to lack of sufficient coconut farmers in Nambihalli, the study selected 36 coconut farmers' households, to cover rest of the (4 households) coconut farmers the study considered another study village Malenahalli, covered 44 coconut households. According to methodology, our study wanted to select in every district 80 coconut farmers. So, here we covered total 80 households in Tumakuru, Hassan and Chitradurga districts. The study considered in each district 80 samples representing and the total sample size is 240. The details are presented in Table 1.2. The primary study period is from 1st July, 2017 to 30th June, 2018. The field work was completed in the month of July-August, 2018.

1.5. Structure of the report

The report is provided in six chapters. The first chapter focuses on background of the study, review of literature, objectives and data methodology used for the study. The development of coconut farmers in terms of area, production and productivity are covered in Chapter two. The coconut farmers' socio-economic profiles and their family size, awareness of crop insurance, head of the family education status, occupation status, land details, source of irrigation, operation land and income sources and details of credit are presented in Chapter three. Chapter four covered coconut crop along with mixed crop/ inter crop, coconut production like, neera, tender coconut, dry coconut, copra, and etc; income from coconut crop, cost of cultivation. Chapter five provided problems faced by the coconut farmers like, seedling, weather problem, water problem, disease problem, post harvest management (PHM), marketing problem, infrastructure problem and extension services details are presented in Chapter five. The last chapter provides major findings and policy insights.

Table 1.1. District-wise coconut area cultivated during 2000-01 to 2014-15

Sl. No	District	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
1	Bagalkote	0.39	0.31	0.23	0.16	0.12	0.10	0.06	0.07	0.10	0.14	0.15	0.16	0.15	0.18	0.17
2	B. Rural *	4.49	5.93	5.71	5.35	5.16	4.86	4.80	0.98	0.55	1.05	1.02	0.91	0.52	0.65	0.51
3	B. Urban**	0.88	0.53	0.53	0.68	0.65	0.73	0.59	0.57	0.96	0.60	0.52	0.51	0.78	0.49	0.29
4	Belgaum	0.05	0.05	0.06	0.16	0.16	0.15	0.16	0.08	0.08	0.08	0.08	0.07	0.03	0.02	0.03
5	Bellari	0.38	0.34	0.42	0.35	0.33	0.29	0.31	0.32	0.26	0.24	0.23	0.21	0.16	0.67	0.13
6	Bidar	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00
7	Bijapur	0.05	0.11	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.07
8	C.Nagar***	2.19	1.99	2.02	2.02	3.17	3.08	2.79	2.81	2.71	2.64	2.58	2.57	2.58	2.16	2.07
9	Chikkaballapur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.17	0.19	0.27	0.72	0.70	0.72	0.47
10	Chikmagalur	8.98	8.40	8.29	8.29	8.12	9.54	9.39	9.41	9.08	8.84	8.64	8.60	9.60	9.57	9.38
11	Chitradurga	11.36	10.63	10.55	11.51	11.31	10.27	10.36	10.53	10.17	9.86	9.60	9.59	9.66	8.89	8.79
12	D. Kannada	4.41	4.17	4.16	4.16	4.09	3.98	3.99	3.99	3.85	3.74	3.64	3.63	3.67	3.78	4.18
13	Davangere	3.67	3.55	3.53	3.47	3.13	3.07	2.84	3.02	2.87	2.82	2.58	2.64	2.69	2.56	2.69
14	Dharwad	0.12	0.11	0.11	0.12	0.11	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.10	0.10	0.07
15	Gadag	0.11	0.11	0.11	0.14	0.16	0.15	0.15	0.15	0.15	0.15	0.16	0.10	0.04	0.07	0.04
16	Gulbarga	0.24	0.23	0.23	0.20	0.19	0.16	0.15	0.14	0.12	0.11	0.05	0.05	0.04	0.03	0.04
17	Hassan	14.61	14.89	15.42	15.98	15.94	15.60	15.31	15.31	14.78	14.48	14.16	14.11	14.32	14.19	13.85
18	Haveri	0.20	0.35	0.49	0.33	0.30	0.25	0.26	0.28	0.27	0.29	0.29	0.29	0.32	0.32	0.31
19	Kodagu	0.31	0.36	0.34	0.34	0.35	0.35	0.51	0.46	0.45	0.41	0.35	0.36	0.36	0.37	0.36
20	Kolar	0.63	0.57	0.56	0.56	0.55	0.53	0.52	0.36	0.35	0.34	0.64	0.63	0.64	0.65	0.58
21	Koppal	0.20	0.30	0.13	0.05	0.09	0.25	0.16	0.14	0.14	0.14	0.14	0.15	0.15	0.16	0.18
22	Mandya	5.07	4.61	4.76	4.78	4.74	4.83	4.53	4.44	5.48	5.91	5.98	6.03	4.86	4.85	6.26
23	Mysore	3.72	5.07	5.27	4.79	5.06	3.32	4.57	5.48	5.25	5.13	5.94	5.93	4.91	5.20	5.07
24	Raichur	0.03	0.06	0.14	0.13	0.12	0.03	0.04	0.11	0.05	0.04	0.01	0.01	0.01	0.01	0.02
25	Ramanagar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.43	3.31	3.33	3.40	3.28	3.18	3.17	3.42
26	Shimoga	2.06	1.87	1.82	1.78	1.73	1.73	1.70	1.70	1.59	1.47	1.44	1.34	1.30	1.26	1.23
27	Tumakuru	30.00	30.01	29.63	29.11	28.95	30.99	31.10	30.75	31.68	32.26	32.27	32.22	33.38	33.87	33.92
28	Udupi	4.09	3.79	3.78	3.81	3.77	3.76	3.71	3.72	3.61	3.77	3.88	3.94	3.99	4.13	4.05
29	Uttar Kannada	1.76	1.64	1.64	1.66	1.64	1.82	1.85	1.84	1.80	1.76	1.74	1.72	1.74	1.80	1.77
30	Yadgir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.04
	Karnataka	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: The author estimated based on the data source of <http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>.

Note: * Bengaluru Rural; ** Bengaluru Urban; *** Chamarajanagar.

Table 1.2. Sample size

Name of the District	Name of the Taluk	Name of the Village	Number of coconut farmers households interviewed
Tumakuru	Gubbi	Parabhavanahalli	40
		Vadaluru	40
District total:			80
Hassan	Chennarayapatna	Malenahalli	44
		Nambihalli	36
District total:			80
Chitradurga	Hiriyuru	Alur	40
		Kunikere	40
District total:			80
Total			240

Source: Primary data, 2018



Field visit Chitradurga District

AREA, PRODUCTION AND PRODUCTIVITY IN KARNATAKA

2.1. Introduction

India is the second largest producer of coconut in the world; contributed 24.24 per cent in production, first in productivity and third in area under cultivation (16%) (Sathya and Muruges) (2015). Naresh and Aggarwal (2013) investigated climate change and its impact on production prospective in Indian agro-climatic areas. According to him, nearly in 200 districts coconut crops are grow in India. But producing more area is only 20 districts and its contribution is nearly 70 per cent of national production. The cultivation of coconut crop is constantly increasing year by year due to demand from market in India. The coconut cultivation area was 1823.91 thousand ha, 12,678.4 million nuts production and productivity 6,951 nuts per ha. in 2001-02 and 2088.47, 22167.45 and 10614, area, production and productivity respectively in 2015-16 in all India level. The coconut area and production and productivity increased tremendously in the said period. In the state of Karnataka used area 335996.00 ha, produced 17624.03 lakhs nuts and 5245 productivity (Nuts/Ha) in 2001-02 and 44,0514 area, 39,310 productions and 8,924 productivity (Nuts/Ha) respectively in 2014-15. In this chapter focus is on the importance of the area, production and productivity in India, state share in all India and district share in Karnataka state. And the study emphases on district share of Karnataka and other relevant information furnished in upcoming pages. To cultivate coconut crop minimum facilities like weather condition, suitable temperature (minimum and maximum), irrigation facilities, infrastructure facilities are required for growing coconut garden/ plants. In India, Kerala area is more suitable for cultivating the coconut crop. It has vast atmosphere, hilly areas (particularly in Wayanad district), geographical conditions are comfortable, Coconut Board also located in the state for providing extension services from the institutional sources and sea snore also one of the reasons to cultivate more coconut area in Kerala state. In India, coconut cultivation second place is occupied by Tamil Nadu state. Here also similar conditions are available like Kerala state. Third place is occupied by Karnataka state. Karnataka is rich in resources, geographical conditions also good like Kerala state, In addition to that Cauvery River also supplying water to some places in Karnataka. According to Kadam and Madan (2017) coconut farming is one of the major commercial farming methods in Karnataka.

2.2. Indian scenario

India is a developing country and it has vast human resources. India is an agrarian country, and rich in minerals. Nearly 60 per cent of the population depends directly or indirectly on agriculture sector. Agriculture sector plays a predominant role in India. Indians are cultivating different crops season centuries together. But since independence the cropping pattern is shifting from traditional crops to commercial crops. Some of the farmers are cultivating coconut crop. The cultivation of coconut area in India is gradually increased from 1823 thousand ha in 2000-01 to 2088 thousand ha in 2015-16. The production also increased from 12678 million nuts to 22167 million nuts in above said period. In addition to that, the productivity constantly increased from 6951 nut per ha to 10614 nuts per ha in the same mentioned study period. The Average Annual Growth Rate (AAGR) in area, production and productivity increased from period-1 (2000-01 to 2009-10) to period-II (2010-11 to 2015-16) (Table 2.1). The main reason to increase the production is due to increase in the area.

Table 2.1. Area, production and productivity of coconut in India

Year	Area ('000ha)	Production (Million nuts)	Productivity (Nut per ha)
2000-01	1823.91	12678.4	6951
2001-02	1932.3	12962.9	6709
2002-03	1921.8	12535	6523
2003-04	1933.7	12178.2	6298
2004-05	1935.0	12832.9	6632
2005-06	1946.8	14811.1	7608
2006-07	1936.8	15840.4	8179
2007-08	1903.19	14743.56	7747
2008-09	1894.57	15729.75	8303
2009-10	1895.2	16918.4	8927
AAGR (2000-01 to 2009-10) Period-1	0.72	3.57	2.86
2010-11	1895.9	16942.92	8937
2011-12	2070.7	23351.22	11277
2012-13	2136.67	22680.03	10615
2013-14	2140.5	21665.19	10122
2014-15	1975.81	20439.6	10345
2015-16	2088.47	22167.45	10614
AAGR(2010-11 to 2015-16) Period-II	1.77	5.57	3.43
AAGR (2000-1 to 2015-16)- Period-III	1.11	4.32	3.07

Authors estimated based on the source.

<http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>.

2.3. State wise analysis

2.3.1. Area

The coconut crop is cultivated during study period all over in India, but the intensity is varying from state to state. The cultivation of coconut area in period-1 AAGR positively significant in India level, similar results reflected in the case of Odisha (19.34%), Tripura (9.13%), Karnataka (2.61%) and etc. In the same manner, during period-II, all India level area of AAGR performed well as compared to previous period. Same results reflected in Gujarat (15.33%), Maharashtra (5.42%), Karnataka (4.16%), Tripura (3.71%) and details are presented in Table 2.2. The main reason for coconut area increase over period of time is due to farmers getting profits in long run and also they are able to cultivate multiple crops in the same land. The total study period (2000-01 to 2015-16) AAGR declined as compared to period-1. But at the state level, Odisha state contributed significant area and followed by Maharashtra (2.67%), Karnataka (2.61%) and etc on the contrary the state share of area in all India level first place was occupied by Kerala, followed by Tamil Nadu, Karnataka, Andhra Pradesh and etc. In all years Kerala state area share is higher as compared to other states. But the area share of Kerala continually declined from 51 per cent in 2000-01 and 37 per cent in 2015-16 (Table 2.6). At the same time Karnataka state share was increased from 18 per cent in 2000-01 to 25 per cent in 2015-16 and same trend followed by Tamil Nadu. In case of Andhra Pradesh the share of area little bit increased constantly.

Table 2.2. Average annual growth rate (AAGR) of area, state- wise in India

Sl. No	Years	AAGR- (2000-01 to 2009-10) Period-I	AAGR-(2010 to 2015-16) Period-II	AAGR-(2000-01 to 2015-16) Period-III
1	Puducherry	-0.46	-2.14	-1.06
2	Lakshadweep	0.00	-0.97	-0.32
3	Tripura	9.13	3.71	6.96
4	Assam	-1.16	1.05	-0.28
5	Andaman Nicobar	-12.65	0.85	-7.77
6	Goa	0.26	0.93	0.50
7	Maharashtra	2.67	5.42	3.77
8	West Bengal	1.83	0.52	1.31
9	Gujarat	1.55	15.33	6.85
10	Odisha	19.34	0.03	11.62
11	Andhra Pradesh	0.16	1.15	0.56
12	Tamil Nadu	2.11	2.88	2.41
13	Karnataka	2.61	4.16	3.23
14	Kerala	-1.74	0.23	-0.95
	All India	0.45	1.77	0.98

Authors estimate based on the source.

<http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>.

2.3.2. Production

Every farmer expects more production and less cost in general trend. Our data reveals that during period-1, AAGR of production increased significantly in all India level and same trend followed by many states. The coconut production of AAGR increased slightly in all India level in period-II as compared to period-1, whereas, state level also increased as compared to previous period due to increased cultivation of coconut. The AAGR production increased States are: Gujarat (35.64%), Andaman Nicobar (30.53%), and Karnataka (23.36%) (Table 2.3). In the total study period AAGR production was 4.30 in all India level. In Gujarat (17.81%) state production AAGR was higher as compared to other states and followed by Tripura (13.55%), Karnataka (12.15%), Odisha (9.61%) and etc.

In contrast, the state share of production in all India level is higher in Kerala (all study years) state followed by Karnataka, Tamil Nadu, Andhra Pradesh (Table 2.7). In Kerala state the share of production of coconut gradually declined from 43.66 per cent in 2000-01 to 33.51 per cent in 2015-16. But in the case of Karnataka state, the share of production in all India level constantly increased from 13.84 per cent in 2000-01 to 23.14 in 2015-16. In the same way, Tamil Nadu state production share in all India level is increased slightly during study period (Table 2.7).

Table 2.3. Average annual growth rate (AAGR) of production, state wise in India

Sl. No	Years	AAGR (2001-02 to 2009-10) Period-I	AAGR (2010-1 to 2015-16) Period-II	AAGR (2001-02 to 2015-16) Period-III
1	Puducherry	3.17	-4.49	0.11
2	Lakshadweep	6.85	2.99	5.47
3	Tripura	8.06	21.78	13.55
4	Assam	2.93	10.07	5.79
5	Andaman Nicobar	-13.30	30.53	5.49
6	Goa	1.08	14.47	5.86
7	Maharashtra	-0.55	7.44	2.64
8	West Bengal	1.75	-0.36	0.90
9	Gujarat	6.66	35.64	17.81
10	Odisha	14.17	2.77	9.61
11	Andhra Pradesh	1.23	9.99	4.73
12	Tamil Nadu	8.32	1.59	5.63
13	Karnataka	4.68	23.36	12.15
14	Kerala	1.49	4.93	2.86
	India	3.46	5.57	4.30

Authors estimate based on the source.

<http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>.

2.3.3. Productivity

The productivity (Nuts/Ha) is very important to the farmers. The productivity is measured by total production (total nuts) divided by total area (total cultivated area) one can get the productivity. Here Table 2.4 suggested that productivity of AAGR increased significantly in period-1 in all India level (3.03%). In period-II the productivity of AAGR increased in all India level as compared to previous period. Similar results found in case of state level AAGR of productivity. But the state level productivity of AAGR is increased more in Andaman Nicobar (28.76%), Goa (22.98%), Tripura (16.87%) Gujarat (15.84%), Karnataka (15.31%) (Table 2.4). The productivity has been increased an an average at all India level and those states are Gujarat (9.25%), Goa (8.73%), Karnataka (7.42%), Tripura (6.50), Lakshadweep (5.88%), Assam (5.67), Kerala (3.54%) and Andhra Pradesh (3.28%).

Table 2.4. Average annual growth rate (AAGR) of productivity, State-wise in India

Sl. No	Years	AAGR-(2001-02 to 2009-10) Period-I	AAGR-(2010-1 to 2015-16) Period-II	AAGR- (2001-02 to 2015-16) Period-III
1	Puducherry	3.81	-3.28	1.28
2	Lakshadweep	6.85	4.14	5.88
3	Tripura	-0.42	16.87	6.50
4	Assam	4.64	7.21	5.67
5	Andaman Nicobar	-11.10	28.76	5.98
6	Goa	0.82	22.98	8.73
7	Maharashtra	-2.81	3.53	-0.27
8	West Bengal	0.12	-0.89	-0.28
9	Gujarat	5.13	15.84	9.25
10	Odisha	0.35	2.38	1.16
11	Andhra Pradesh	1.22	6.38	3.28
12	Tamil Nadu	6.08	-1.37	3.10
13	Karnataka	2.16	15.31	7.42
14	Kerala	3.27	3.94	3.54
	India	3.03	3.43	3.19

Authors estimate based on the source.

<http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>.

2.4. District-wise area, production and productivity in Karnataka

The area of AAGR has been declined in period-1 from 2.81 (2001-02 to 2009-10) and 0.51 in period-II (2010-1 to 2014-15). The district level AAGR declined in period-1 to period-II and those districts are: Bengaluru Urban, Bengaluru Rural, Belgaum, Bidar, Bijapur,

Charmrajnagar, Chikmagalur, Chitradurga, Dharwad, Gadag, Hassan, Haveri, Kodagu, Koppal, Mandya, Mysore, Raichur, Tumakuru and Uttar Kannada. Few district areas's AAGR increased from period-1 to period-II and those districts are: Bagalkote, Bellari, Dakshina Kannada, Kolar and Udupi and these details are available in Table 2.5. The coconut production declined from period-1 to period-II in state of Karnataka. In the same manner the production declined nearly in 23 districts. And in four districts coconut production increased and those are: Bellari, Davanger, Haveri and Raichur. Coconut productivity declined in state level in period-II as compared to period-1. In similar results, we can find in 24 districts in Karnataka.

The share of coconut area district wise details are presented in Table 2.8. Priyadarshini (2013) elaborated the importance of coconut in the Karnataka state. The coconut area was cultivated from ancient times and it used to be in worship of God and goddess in traditional Hindu religion. Tumakuru is the largest producer of coconut in Karnataka state. Among the districts, Tumakuru district share of coconut area is constantly increasing and also Tumakuru is highest coconut area share among the districts in Karnataka state followed by Hassan and Chitradurga. These three districts (Tumakuru, Hassan and Chitradurga) area share of total Karnataka is nearly 57 per cent in 2014-15. It indicates that cultivation of coconut area is constantly increasing compared to other districts.

The Tumakuru district share of production in Karnataka is highest among the 30 districts in Karnataka followed by Hassan and Chitradurga. But the Tumakuru district, share of production in Karnataka state gradually declined from 37.64 per cent in 200-01 and 32.66 per cent in 2014-15. It indicates that the share slowly is decreasing and similar relevant results are also seen in Hassan and Chitradurga districts. But the Mandya district share of production is increasing constantly and some fluctuation were observed during study period.

Table 2.5.Average annual growth rate (AAGR) of area, production and productivity, districts in Karnataka

Sl. No	Districts	Area			Production			Productivity		
		AAGR (2001-02 to 2009-10)-Period-I	AAGR (2010-1 to 2014-15)-Period-II	AAGR (2001-02 to 2014-15)-Period-III	AAGR (2001-02 to 2009-10)-Period-I	AAGR (2010-1 to 2014-15)-Period-II	AAGR (2001-02 to 2014-15)-Period-III	AAGR (2001-02 to 2009-10)-Period-I	AAGR (2010-1 to 2014-15)-Period-II	AAGR (2001-02 to 2014-15)-Period-III
1	Bagalkote	-3.00	4.19	-0.43	4.41	-8.01	-0.02	4.99	6.10	5.39
2	Bangalore R	0.76	-10.34	-3.20	0.73	-19.26	-6.41	6.16	6.11	6.14
3	Bangalore U	2.97	-7.55	-0.79	12.84	-10.18	4.62	6.49	6.11	6.35
4	Belgaum	17.12	-12.81	6.43	22.48	-18.00	8.02	6.27	6.11	6.22
5	Bellari	-1.44	39.37	13.13	2.90	18.61	8.51	5.00	6.11	5.39
6	Bidar	85.52	2.78	55.97	92.86	-9.65	56.25	5.24	6.19	5.58
7	Bijapur	16.93	2.03	11.61	22.46	-7.99	11.59	4.99	6.10	5.38
8	C.nagar*	6.32	-4.01	2.63	17.71	-9.43	8.02	11.31	7.68	10.01
9	Chikkaballapur	NA	35.24	14.62	NA	6.27	7.32	NA	6.11	4.92
10	Chikmagalur	2.79	1.80	2.44	15.19	1.75	10.39	12.47	1.54	8.57
11	Chitradurga	1.24	-1.70	0.19	4.21	-30.47	-8.18	3.01	10.39	5.65
12	D.Kannada	0.92	2.84	1.61	8.45	-11.45	1.35	7.53	20.57	12.19
13	Davangere	-0.12	-0.25	-0.16	4.84	30.32	13.94	5.05	24.80	12.10
14	Dharwad	2.15	-6.79	-1.04	7.12	-18.65	-2.08	5.00	6.11	5.40
15	Gadag	6.97	-14.80	-0.80	12.41	-27.68	-1.91	5.23	6.11	5.54
16	Gulbarga	-5.25	-9.35	-6.71	-1.25	9.49	2.58	4.39	6.10	5.00
17	Hassan	2.74	-0.39	1.62	6.23	6.73	6.41	3.80	3.33	3.63
18	Haveri	12.13	1.88	8.47	11.54	-23.64	-1.02	-0.52	21.67	7.41
19	Kodagu	7.11	-1.79	3.93	12.02	-3.94	6.32	4.99	6.11	5.39
20	Kolar	-3.33	16.43	3.73	1.43	-33.97	-11.21	6.17	6.11	6.15
21	Koppal	18.44	5.77	13.92	23.48	-2.55	14.18	5.01	6.11	5.40
22	Mandya	4.91	2.96	4.21	17.68	-1.21	10.93	12.25	4.39	9.44
23	Mysore	9.10	0.94	6.18	21.43	-38.10	0.17	11.77	16.21	13.36
24	Raichur	29.96	8.49	22.30	34.40	37.29	35.43	5.02	6.11	5.41
25	Ramanagar	NA	1.14	0.67	NA	-0.95	2.62	NA	12.94	7.30
26	Shimoga	-0.97	-3.11	-1.74	11.69	-10.66	3.71	12.83	6.15	10.44
27	Tumakuru	3.70	1.52	2.92	5.60	-7.79	0.82	1.95	5.13	3.09
28	Udupi	1.89	1.92	1.90	10.51	14.33	11.87	8.55	19.79	12.57
29	U. Kannada	2.90	0.53	2.05	8.16	-2.59	4.32	5.21	5.11	5.18
30	Yadgir	NA	-4.90	-1.75	NA	-5.74	-2.05	NA	-0.78	-0.28
	Karnataka	2.81	0.51	1.99	7.28	-8.21	1.75	4.57	6.11	5.12

Authors estimated based on the source. <http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>. * Chamarajanagar .

Table 2.6. State share in total area in India

Sl. No	Years	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Nagaland	0.00	0.05	0.36	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.06	0.07	0.07	0.02
2	Puducherry	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.10	0.09	0.09	0.10	0.00
3	Lakshadweep	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.12	0.12	0.13	0.00
4	Tripura	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.30	0.31	0.31	0.31	0.30	0.30	0.32	0.35	0.34
5	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.71	0.71	0.75	0.71
6	Assam	1.15	1.09	1.09	1.10	1.10	0.98	0.98	1.00	0.99	0.99	0.99	1.00	1.04	0.95	1.07	0.94
7	Andaman Nicobar	1.38	0.00	1.32	1.31	1.32	1.31	1.10	1.13	1.14	1.14	1.14	1.05	1.02	1.02	1.11	1.09
8	Goa	1.37	1.29	1.31	1.30	1.30	1.30	1.32	1.34	1.35	1.35	1.35	1.24	0.99	1.20	1.31	0.00
9	Maharashtra	0.92	0.87	0.85	0.93	0.93	0.92	1.08	1.10	1.11	1.11	1.11	1.01	1.31	1.31	1.42	1.33
10	West Bengal	1.34	1.29	1.30	1.26	1.27	1.28	1.30	1.50	1.51	1.51	1.51	1.41	1.37	1.37	1.49	1.41
11	Gujarat	0.00	0.73	0.78	0.83	0.85	0.84	0.85	0.86	0.84	0.84	0.84	1.01	1.20	1.48	1.60	0.00
12	Odisha	0.97	2.42	2.77	2.86	2.61	2.61	2.63	2.68	2.69	2.69	2.69	2.60	2.54	2.37	2.57	2.44
13	Andhra Pradesh	5.63	5.38	5.47	5.38	5.37	5.34	5.26	5.32	5.49	5.49	5.49	6.86	6.03	5.70	5.36	4.98
14	Tamil Nadu	17.74	17.38	18.00	18.24	18.45	19.04	19.34	20.14	20.56	20.58	20.57	20.80	21.77	21.73	23.54	22.01
15	Karnataka	18.30	19.14	19.53	19.44	19.92	19.80	20.70	21.28	22.12	22.11	22.10	24.68	24.01	24.17	26.07	25.20
16	Kerala	50.76	48.62	46.79	46.86	46.40	46.12	44.97	43.02	41.58	41.58	41.56	36.99	37.36	37.24	32.89	36.90
	India	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Authors estimated based on the source. <http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>.

Table 2.7. State share in total production in India

Sl. No	Years	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Nagaland	0.00	0.04	0.04	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.01
2	Puducherry	0.19	0.19	0.19	0.25	0.23	0.19	0.18	0.18	0.20	0.19	0.18	0.18	0.13	0.16	0.11	0.00
3	Lakshadweep	0.29	0.41	0.42	0.44	0.41	0.36	0.33	0.36	0.34	0.37	0.37	0.37	0.33	0.33	0.35	0.00
4	Tripura	0.06	0.05	0.06	0.06	0.05	0.05	0.04	0.08	0.07	0.07	0.07	0.07	0.12	0.13	0.14	0.13
5	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.65	0.69	0.64
6	Assam	1.07	1.26	1.28	1.27	1.20	1.38	0.97	0.92	0.94	0.93	0.93	0.93	1.30	0.63	1.16	0.60
7	Andaman Nicobar	0.70	0.00	0.75	0.78	0.68	0.59	0.56	0.55	0.52	0.52	0.60	0.60	0.48	0.60	0.63	1.41
8	Goa	0.99	0.97	0.97	1.00	0.96	0.85	0.80	0.87	0.81	0.81	0.81	0.81	0.60	0.59	0.62	0.00
9	Maharashtra	1.93	1.50	1.44	2.24	2.13	1.85	1.10	1.19	1.11	1.11	1.11	1.11	0.80	0.87	0.92	1.22
10	West Bengal	2.61	2.50	2.59	2.61	2.42	2.18	2.27	2.41	2.26	2.26	2.26	2.26	1.69	1.71	1.82	1.69
11	Gujarat	0.00	0.79	0.84	0.92	1.08	0.93	0.87	0.94	1.00	1.00	1.00	1.00	1.46	1.36	1.44	0.00
12	Odisha	0.87	1.61	1.64	2.00	2.14	1.85	1.74	1.87	1.75	1.76	1.75	1.75	1.73	1.50	1.59	1.48
13	Andhra Pradesh	8.62	8.68	9.24	9.81	9.35	6.02	8.37	7.59	6.17	6.16	6.15	6.15	8.50	8.44	7.16	6.44
14	Tamil Nadu	25.18	25.41	22.82	21.03	25.27	32.86	34.28	33.70	34.11	34.11	34.06	34.06	30.22	31.93	33.84	27.84
15	Karnataka	13.84	11.60	12.17	12.56	9.43	8.17	10.26	11.09	13.83	13.83	13.81	13.81	25.33	23.27	25.15	23.14
16	Kerala	43.66	44.31	45.54	45.03	44.63	42.71	38.22	38.26	36.89	36.88	36.83	36.83	26.60	27.55	23.96	33.51
	India	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Authors estimated based on the source. <http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>.

Table 2.8. District share in total area in Karnataka

Sl. No	Districts	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
1	Bagalkote	0.39	0.31	0.23	0.16	0.12	0.10	0.06	0.07	0.10	0.14	0.15	0.16	0.15	0.18	0.17
2	Bangalore ®	4.49	5.93	5.71	5.35	5.16	4.86	4.80	0.98	0.55	1.05	1.02	0.91	0.52	0.65	0.51
3	Bangalore (U)	0.88	0.53	0.53	0.68	0.65	0.73	0.59	0.57	0.96	0.60	0.52	0.51	0.78	0.49	0.29
4	Belgaum	0.05	0.05	0.06	0.16	0.16	0.15	0.16	0.08	0.08	0.08	0.08	0.07	0.03	0.02	0.03
5	Bellari	0.38	0.34	0.42	0.35	0.33	0.29	0.31	0.32	0.26	0.24	0.23	0.21	0.16	0.67	0.13
6	Bidar	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00
7	Bijapur	0.05	0.11	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.07
8	Chamarajanagar	2.19	1.99	2.02	2.02	3.17	3.08	2.79	2.81	2.71	2.64	2.58	2.57	2.58	2.16	2.07
9	hikkaballapur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.17	0.19	0.27	0.72	0.70	0.72	0.47
10	Chikmagalur	8.98	8.40	8.29	8.29	8.12	9.54	9.39	9.41	9.08	8.84	8.64	8.60	9.60	9.57	9.38
11	Chitradurga	11.36	10.63	10.55	11.51	11.31	10.27	10.36	10.53	10.17	9.86	9.60	9.59	9.66	8.89	8.79
12	D.Kannada	4.41	4.17	4.16	4.16	4.09	3.98	3.99	3.99	3.85	3.74	3.64	3.63	3.67	3.78	4.18
13	Davangere	3.67	3.55	3.53	3.47	3.13	3.07	2.84	3.02	2.87	2.82	2.58	2.64	2.69	2.56	2.69
14	Dharwad	0.12	0.11	0.11	0.12	0.11	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.10	0.10	0.07
15	Gadag	0.11	0.11	0.11	0.14	0.16	0.15	0.15	0.15	0.15	0.15	0.16	0.10	0.04	0.07	0.04
16	Gulbarga	0.24	0.23	0.23	0.20	0.19	0.16	0.15	0.14	0.12	0.11	0.05	0.05	0.04	0.03	0.04
17	Hassan	14.61	14.89	15.42	15.98	15.94	15.60	15.31	15.31	14.78	14.48	14.16	14.11	14.32	14.19	13.85
18	Haveri	0.20	0.35	0.49	0.33	0.30	0.25	0.26	0.28	0.27	0.29	0.29	0.29	0.32	0.32	0.31
19	Kodagu	0.31	0.36	0.34	0.34	0.35	0.35	0.51	0.46	0.45	0.41	0.35	0.36	0.36	0.37	0.36
20	Kolar	0.63	0.57	0.56	0.56	0.55	0.53	0.52	0.36	0.35	0.34	0.64	0.63	0.64	0.65	0.58
21	Koppal	0.20	0.30	0.13	0.05	0.09	0.25	0.16	0.14	0.14	0.14	0.14	0.15	0.15	0.16	0.18
22	Mandya	5.07	4.61	4.76	4.78	4.74	4.83	4.53	4.44	5.48	5.91	5.98	6.03	4.86	4.85	6.26
23	Mysore	3.72	5.07	5.27	4.79	5.06	3.32	4.57	5.48	5.25	5.13	5.94	5.93	4.91	5.20	5.07
24	Raichur	0.03	0.06	0.14	0.13	0.12	0.03	0.04	0.11	0.05	0.04	0.01	0.01	0.01	0.01	0.02
25	Ramanagar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.43	3.31	3.33	3.40	3.28	3.18	3.17	3.42
26	Shimoga	2.06	1.87	1.82	1.78	1.73	1.73	1.70	1.70	1.59	1.47	1.44	1.34	1.30	1.26	1.23
27	Tumakuru	30.00	30.01	29.63	29.11	28.95	30.99	31.10	30.75	31.68	32.26	32.27	32.22	33.38	33.87	33.92
28	Udupi	4.09	3.79	3.78	3.81	3.77	3.76	3.71	3.72	3.61	3.77	3.88	3.94	3.99	4.13	4.05
29	U. Kannada	1.76	1.64	1.64	1.66	1.64	1.82	1.85	1.84	1.80	1.76	1.74	1.72	1.74	1.80	1.77
30	Yadgir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.04
	Karnataka	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Authors estimated based on the source. <http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>.

Table 2.9. District share in total production in Karnataka

Sl. No	Districts	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
1	Bagalkote	0.36	0.36	0.27	0.19	0.14	0.12	0.07	0.07	0.10	0.14	0.15	0.16	0.15	0.18	0.17
2	Bangalore ®	4.09	5.23	5.03	4.72	4.57	4.29	4.24	0.98	0.55	1.05	1.02	0.91	0.52	0.65	0.51
3	Bangalore (U)	0.77	0.47	0.47	0.60	0.58	0.64	0.52	0.57	0.96	0.60	0.52	0.51	0.78	0.49	0.29
4	Belgaum	0.04	0.06	0.06	0.16	0.17	0.16	0.17	0.08	0.08	0.08	0.08	0.07	0.03	0.02	0.03
5	Bellari	0.34	0.40	0.49	0.41	0.39	0.34	0.37	0.32	0.26	0.24	0.23	0.21	0.16	0.67	0.13
6	Bidar	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00
7	Bijapur	0.04	0.13	0.05	0.06	0.05	0.05	0.06	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.07
8	Chamarajanagar	1.49	1.31	1.33	1.33	2.09	2.03	1.84	2.79	2.34	2.64	2.57	2.02	2.06	1.71	2.07
9	Chikkaballapur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.17	0.19	0.27	0.72	0.70	0.72	0.47
10	Chikmagalur	4.31	3.91	3.86	3.86	3.79	4.44	4.38	6.82	6.43	6.65	5.01	4.71	5.31	7.01	6.06
11	Chitradurga	12.67	11.48	11.40	12.42	12.26	11.11	11.22	10.49	10.17	9.65	13.84	12.96	13.17	14.75	7.58
12	D.Kannada	3.59	4.38	4.37	4.37	4.31	4.19	4.20	3.98	4.65	3.74	5.10	4.89	5.00	6.43	7.18
13	Davangere	4.10	3.83	3.82	3.75	3.39	3.32	3.08	3.00	2.87	3.25	2.19	2.64	2.69	1.81	4.18
14	Dharwad	0.11	0.13	0.13	0.14	0.13	0.12	0.13	0.11	0.11	0.11	0.12	0.12	0.10	0.10	0.07
15	Gadag	0.10	0.12	0.13	0.16	0.19	0.17	0.17	0.15	0.11	0.15	0.16	0.10	0.04	0.07	0.04
16	Gulbarga	0.23	0.29	0.29	0.25	0.24	0.20	0.18	0.14	0.12	0.11	0.05	0.05	0.04	0.03	0.04
17	Hassan	15.42	15.20	15.76	16.31	16.35	15.96	15.68	14.38	12.11	14.48	9.59	14.11	14.32	9.36	9.73
18	Haveri	0.18	0.41	0.58	0.38	0.35	0.29	0.31	0.28	0.21	0.18	0.29	0.29	0.32	0.32	0.31
19	Kodagu	0.29	0.43	0.40	0.40	0.41	0.41	0.61	0.46	0.45	0.41	0.35	0.36	0.36	0.37	0.36
20	Kolar	0.57	0.50	0.49	0.49	0.48	0.47	0.46	0.36	0.35	0.34	0.64	0.63	0.64	0.65	0.58
21	Koppal	0.18	0.35	0.15	0.06	0.11	0.29	0.18	0.14	0.14	0.14	0.14	0.15	0.15	0.16	0.18
22	Mandya	4.62	4.06	4.20	4.21	4.19	4.26	4.01	5.50	5.07	8.35	7.79	7.84	6.38	4.37	6.96
23	Mysore	2.53	3.33	3.47	3.15	3.34	2.19	3.01	5.46	6.76	4.28	7.70	5.42	4.53	5.20	5.03
24	Raichur	0.03	0.07	0.16	0.15	0.14	0.04	0.05	0.11	0.05	0.04	0.01	0.01	0.01	0.01	0.02
25	Ramanagar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.41	3.22	3.33	3.40	3.82	3.75	3.17	4.27
26	Shimoga	1.39	1.22	1.18	1.16	1.13	1.13	1.11	1.61	1.94	1.47	1.44	1.34	1.32	1.26	1.23
27	Tumakuru	37.64	36.43	35.99	35.32	35.28	37.68	37.87	33.13	34.68	32.26	31.99	30.61	32.02	33.35	32.66
28	Udupi	3.33	3.98	3.97	4.00	3.98	3.95	3.91	3.57	4.13	4.26	3.68	3.88	3.97	5.21	7.98
29	Uttar Kannada	1.59	1.92	1.92	1.94	1.92	2.13	2.17	1.88	1.91	1.76	1.55	1.33	1.36	1.80	1.77
30	Yadgir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.04
	Karnataka	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Authors estimated based on the source. <http://www.coconutboard.gov.in/presentation/statistics/statistics.aspx>.

SOCIO-ECONOMIC CHARACTERISTICS AND LAND PARTICULARS

Chapter 3 provides the information about socio-economic characteristic of coconut farmers, awareness of about cropping insurance, head of the family education status, total population of the households, information about land, irrigation sources, soil quality of operation holdings, particulars of coconut land, sources of income and details of credit information furnished below.

3.1. Socio-economic characteristics of coconut farmers

Almost all coconut farmers are having ration cards. The people having ration cards were hundred per cent in Chitradurga district, followed by Hassan (98.75%) and Tumakuru (96%). Majority of the coconut farmers were having Below Poverty Line (BPL) ration cards. Very few (Tumakuru-3) of them were having Above Poverty Line (APL) ration cards and details are presented in Table 3.1. Most of the coconut farmers belong to Other Backward Community (OBC) (72%), followed by General Caste/Other Caste (OC) (19%), Scheduled Tribes (ST)(8%) and Scheduled Caste (SC)(2%). The OBC are higher in Hassan (70%) district, followed by Tumakuru (70%) and Chitradurga (69%). Among the sample villages, OBC are higher in Nambihalli (88.89%) village, followed by Parabhavanahalli (78%). Among the social groups SCs are very less in cultivation of coconut crop. To cultivation of coconut crop, land played a key role, in addition to that financial background is required. Due to lack of financial support, SCs were unable to cultivate the coconut crop in selected villages. To inclusive the (SCs farmers') growth, Government of Karnataka, provide some intensive facilities to the SCs farmers. Therefore, social imbalances will reduce in selected villages. Almost all (97%) coconut farmers belong to Hindu religion and only three per cent of the farmers were practicing Muslim religion at the time of study and details are presented in Table 3.1.

Table 3.1. Socio-economic characteristics of coconut farmers

Name of the Village/District	Do you have ration card			Type of ration card				Social group					Religion		
	Yes	No	Total	APL	BPL	Others	Total	SC	ST	OBC	OC	Total	Hindu	Muslim	Total
Parabhavanahalli	39 (97.5)	1 (2.50)	40	6 (15.38)	33 (84.62)	0 (0.00)	39	0 (0.00)	4 (10.00)	31 (77.50)	5 (12.50)	40	40 (100)	0 (0.0)	40
Vadaluru	38 (95.00)	2 (5.00)	40	10 (26.32)	27 (71.05)	1 (2.63)	38	1 (2.50)	2 (5.00)	25 (62.50)	12 (30.00)	40	40 (100)	0 (0.0)	40
Tumakuru	77 (96.25)	3 (3.75)	80	16 (20.78)	60 (77.92)	1 (1.30)	77	1 (1.25)	6 (7.50)	56 (70.0)	17 (21.25)	80	80 (100)	0 (0.0)	80
Malenahalli	43 (97.73)	1 (2.27)	44	0 (0.00)	43 (100)	0 (0.00)	43	3 (6.82)	10 (22.73)	29 (65.91)	2 (4.55)	44	44 (100)	0 (0.0)	44
Nambihalli	36 (100.0)	0 (0.00)	36	4 (11.11)	32 (88.89)	0 (0.00)	36	0 (0.00)	2 (5.56)	32 (88.89)	2 (95.56)	36	34 (94.44)	2 (5.56)	36
Hassan	79 (98.7)	1 (1.25)	80	4 (5.06)	75 (94.94)	0 (0.00)	79	3 (3.75)	12 (15.0)	61 (76.25)	4 (5.00)	80	78 (97.5)	2 (2.5)	80
Alur	40 (100.0)	0 (0.0)	40	12 (30.00)	28 (70.0)	0 (0.00)	40	0 (0.00)	0 (0.00)	27 (67.50)	13 (32.50)	40	40 (100)	0 (0.0)	40
Kunikere	40 (100.0)	0 (0.0)	40	4 (10.00)	36 (90.0)	0 (0.00)	40	0 (0.00)	1 (2.50)	28 (70.00)	11 (27.50)	40	36 (90.0)	4 (10.0)	40
Chitradurga	80 (100.0)	0 (0.0)	80	16 (20.00)	64 (80.00)	0 (0.00)	80	0 (0.00)	1 (1.25)	55 (68.75)	24 (30.00)	80	76 (95.0)	4 (5.0)	80
Total	236 (98.33)	4 (1.67)	240	36 (15.25)	199 (84.32)	1 (0.42)	236	4 (1.67)	19 (7.92)	172 (71.67)	45 (18.75)	240	234 (97.5)	6 (2.5)	240

Source: Primary data, 2018.

Note: Figures in brackets are percentage to row total.

3.2. Particulars of insurance awareness

Awareness is very important to the people to know the central or state program in India. The awareness information is broadcasting through television (TV), print media, magazine, posters, friends and mouth word etc. In our study villages, most of the farmers (88%) did not insure their crop last year. Kumbalep and Devaraju (2018) find that only 20 per cent of the Kolar farmers were aware about the crop insurance. In our study results reveals that very few (13%) of the farmers were insured during study period. The insured farmers are higher in Tumakuru (28%) district, followed by Chitradurga (10%) and there is no insurance farmer in Hassan district. In the same manner, the highest insurance was in Vadaluru (40%) village, followed by Parabhavanahalli (15%) and Alur (15%). And the average crops insurance is higher in Chitradurga (7.91 acres) district and Tumakuru (5.88 acres). Similarly Kunikere village farmers insured for more acres (9.50 average acres) followed by Parabhavanahalli (7.92 acres). Likewise, the coconut crop also last year were insured by few (12%) of the farmers. The bankers suggested to farmers (26 farmers) to insure their coconut crops for future crop loss purposes. The bankers were incurring amount from the initial loan sanctioned time, and details are presented in Table 3.2.

In our study, a majority (87%) of the coconut farmers had not insured their coconut crop during study period. The main reasons are: Farmers were not interested (41%) to insure their crop due to their crop would not affect, secondly, lack of awareness (27%) information from grass root level, thirdly, they don't know the insurance information (9%) in the mentioned study villages and finally, farmers had no trust on insurance company (9%) due to delay of the payment p during processing time. Among the reasons, not interested reason occupied first place and followed by lack of awareness, don't know no trust details are presented in Table3.2.

Table 3.2. Particulars of insurance

Name of the Village/ District	Did you insure the crop last year			Average insured land	Did your coconut crop insure last year?			Who suggested *		Reasons for not insure the coconut crop				
	Yes	No	Total		Yes	No	Total	Bank	Hot. Dept.**	Not interested	Lack of awareness	Don't know	No trust	Total
Parabhavanahalli	6 (15.0)	34 (85.0)	40	7.92	6 (15.00)	34 (85.0)	40	6	NA	24 (70.59)	0 (0.00)	0 (0.00)	10 (29.41)	34
Vadaluru	16 (40.0)	24 (60.0)	40	5.12	14 (35.0)	26 (65.0)	40	13	1	10 (41.67)	0 (0.00)	11 (45.83)	3 (12.50)	24
Tumakur	22 (27.5)	58 (72.5)	80	5.88	20 (25.0)	60 (75.0)	80	19	1	34 (58.62)	0 (0.00)	11 (18.97)	13 (22.41)	58
Malenahalli	0 (0.00)	44 (100)	44	NA	0 (0.00)	44 (100)	44	NA	NA	15 (34.09)	19 (43.18)	9 (20.45)	1 (2.27)	44
Nambihalli	0 (0.00)	36 (100)	36	NA	0 (0.00)	36 (100)	36	NA	NA	20 (55.56)	13 (36.11)	3 (8.33)	0 (0.00)	36
Hassan	0 (0.00)	80 (100)	80	NA	0 (0.00)	80 (100)	80	NA	NA	35 (43.75)	32 (40.0)	12 (15.00)	1 (1.25)	80
Alur	6 (15.0)	34 (85.0)	40	7.38	6 (15.00)	34 (85.0)	40	5	1	8 (23.53)	10 (29.41)	13 (38.24)	3 (8.82)	34
Kunikere	2 (5.00)	38 (95.0)	40	9.50	2 (5.00)	38 (95.0)	40	2	NA	10 (26.32)	14 (36.84)	13 (34.21)	1 (2.63)	38
Chitradurga	8 (10.0)	72 (90.0)	80	7.91	8 (10.0)	72 (90.0)	80	7	1	18 (25.0)	24 (33.33)	26 (36.11)	4 (5.56)	72
Total	30 (12.5)	210 (87.5)	240	6.42	28 (11.7)	212 (88.3)	240	26	2	87 (41.4)	56 (26.67)	49 (23.33)	18 (8.57)	210

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

*Who suggested you insure the crop. **Horticulture Department

3.3. Head of the family education status

The head of the family age may be determined in proper of well being of the family. In selected coconut farmers, majority of the households head of the family were males (95%) and followed by females (5%). The average head of the family female age is 57 and 51 is male. The female head of the family average age is low (55) in Nambihalli village and the highest average head of the family is Vadaluru (65). Surprisingly, there is no female head of the households in Alur village. The head of the male average was lowest age from Parabhavanahalli (49) and Vadaluru (49) villages and the highest average age comes from Kunikere (58) village.

Education plays a key role in development of the household. Due to lack of education most of the farmer are facing lot of problems in day-to-day life. Our study results reveal that nearly 39 per cent of the head of the households studied 6th standard to 10th standard, followed by intermediate (20%), illiterates (19%), 1st to 5th (14%) and degree (6%). And other professional degrees and post graduates are less than one per cent. The head of the household's education 6th standard to 10th is higher in Tumakuru district (43%), followed by Chitradurga (40%) and Hassan (35%). Illiterates are higher in Hassan district (33%). Based on the education, people choose the economic activity. The occupation is one of the income determining factors of the person. In our study majority of the coconut farmers were working in agriculture & allied activities (97%), self business (2%) and service (1%), and unemployed (1%) in the sample households and details are presented in Table 3.3.

Table 3.3. Particulars of head of the family

Name of the Village/ District	Head of the family			Average age of the head			Education level								Occupation of the head				
	Male	Female	Total	Male	Female	Total	6 th to 10	Intermediate	Illiterate	1 st to 5 th	Degree	Post-graduation and above	Professional degree	Total	Agriculture & allied activities	Service	Self-Business	Un-employed	Total
Parabhavanahalli	38 (95.0)	2 (5.00)	40	49	57	50	17 (42.5)	14 (35.0)	4 (10.0)	3 (7.50)	2 (5.00)	0 (0.00)	0 (0.00)	40	39 (97.5)	0 (0.0)	0 (0.00)	1 (2.5)	40
Vadaluru	39 (97.5)	1 (2.50)	40	49	65	49	17 (42.5)	11 (27.5)	5 (12.5)	1 (2.50)	6 (15.0)	0 (0.00)	0 (0.00)	40	39 (97.5)	0 (0.0)	1 (2.50)	0 (0.0)	40
Tumakuru	77 (96.2)	3 (3.75)	80	49	59	49	34 (42.5)	25 (31.2)	9 (11.2)	4 (5.00)	8 (10.0)	0 (0.00)	0 (0.00)	80	78 (97.5)	0 (0.0)	1 (1.25)	1 (1.2)	80
Malenahalli	42 (95.4)	2 (4.55)	44	49	58	49	14 (31.8)	5 (11.4)	15 (34.1)	8 (18.18)	1 (2.27)	1 (2.27)	0 (0.00)	44	43 (97.7)	1 (2.3)	0 (0.00)	0 (0.0)	44
Nambihalli	31 (86.1)	5 (13.89)	36	54	55	54	14 (38.8)	5 (13.8)	11 (30.5)	5 (13.89)	1 (2.78)	0 (0.00)	0 (0.00)	36	33 (91.6)	1 (2.7)	2 (5.56)	0 (0.0)	36
Hassan	73 (91.2)	7 (8.75)	80	51	56	51	28 (35.0)	10 (12.5)	26 (32.5)	13 (16.4)	2 (2.5)	1 (1.25)	0 (0.00)	80	76 (95.0)	2 (2.5)	2 (2.50)	0 (0.0)	80
Alur	40 (100)	0 (0.00)	40	52	NA	52	19 (47.5)	10 (25.0)	2 (5.00)	4 (10.0)	3 (7.50)	1 (2.50)	1 (2.50)	40	40 (100)	0 (0.0)	0 (0.00)	0 (0.0)	40
Kunikere	39 (97.5)	1 (2.50)	40	55	58	55	13 (32.5)	4 (10.0)	9 (22.5)	13 (32.5)	1 (2.50)	0 (0.00)	0 (0.00)	40	39 (97.5)	0 (0.0)	1 (2.50)	0 (0.0)	40
Chitradurga	79 (98.7)	1 (1.25)	80	53	58	53	32 (40.0)	14 (17.5)	11 (13.7)	17 (21.3)	4 (5.0)	1 (1.25)	1 (1.25)	80	79 (98.7)	0 (0.0)	1 (1.25)	0 (0.0)	80
Total	229 (95.4)	11 (4.58)	240	51	57	51	94 (39.2)	49 (20.4)	46 (19.2)	34 (14.2)	14 (5.8)	2 (0.83)	1 (0.42)	240	233 (97.1)	2 (0.8)	4 (1.67)	1 (0.4)	240

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

3.4. Population of the study households

The average male population is low in Parabhavanahalli (1.93) village as compared to other villages. In this village the female average population size is little higher as compared to male population. The average total family size is 4.10. And the lowest average family size come from Alur (3.80) village and average family size is higher in Vadaluru (4.38) village and the details are presented in Table 3.4.

Table 3.4. Population of the sample households

Name of the Village/ District	Total Male population	Average male population	Total female population	Average female population	Total population	Average population
Parabhavanahalli	77	1.93	95	2.38	172	4.30
Vadaluru	96	2.46	79	2.03	175	4.38
Tumakuru	173	2.19	174	2.20	347	4.34
Malenahalli	97	2.20	79	1.80	176	4.00
Nambihalli	82	2.28	68	1.94	150	4.17
Hassan	179	2.24	147	1.86	326	4.08
Alur	81	2.03	71	1.78	152	3.80
Kunikere	89	2.23	70	1.75	159	3.98
Chitradurga	170	2.13	141	1.76	311	3.89
Total	522	2.18	462	1.94	984	4.10

Source: Primary data, 2018.

Note: Figures in brackets are percentage to row total.

3.5. Particulars of land

Land is very important production asset in rural people. Without land survival is very difficult in day-to-day life. Our study result reveals that study households everybody is having land. The average owned land is higher in Chitradurga district (7.65 acres); followed by Tumakuru district (6 acres) and Hassan district (3.81 acres). In similar way, the average owned land is higher in Alur village (9.26 acres), followed by Kunikere, Vadaluru; and the lowest average owned land comes from Malenahalli village. A similar result appears in case of average irrigated owned land, average rain fed land. In general, farmers were having land fragments in different places in the village. In our study villages, coconut farmers were having two fragments is highest (39%), followed by one fragment (38.7%), three (15%), four (5%), five (2%) and six (0.4%) is one household. In Nambihalli village, nine farmers were having three fragments in different places in their village (Table 3.5).

Table 3.5. Particulars of total agricultural owned land and fragments

Name of the Village/ District	Agricultural owned land			No. of land fragments total owned land						
	Average owned land	Average Irrigated owned land	Average Rain fed land	1	2	3	4	5	6	Total
Parabhavanahalli	5.86	5.08	5.17	21(52.50)	8(20.00)	5(12.50)	4(10.00)	1(2.50)	1(2.50)	40
Vadaluru	6.02	5.59	2.50	13(32.50)	16(40.00)	6(15.00)	4(10.00)	1(2.50)	0(0.00)	40
Tumakuru	5.94	5.33	3.57	34(42.50)	24(30.00)	11(13.75)	8(10.00)	2(2.50)	1(1.25)	80
Malenahalli	3.18	2.53	1.57	17(38.64)	20(45.45)	5(11.36)	1(2.27)	1(2.27)	0(0.00)	44
Nambihalli	4.57	3.79	1.87	11(30.56)	15(41.67)	9(25.00)	1(2.78)	0 (0.0)	0(0.00)	36
Hassan	3.81	3.11	1.69	28(35.00)	35(43.75)	14(17.50)	2(2.50)	1(1.25)	0(0.00)	80
Alur	9.26	7.31	4.33	11(27.50)	22(55.00)	5(12.50)	2(5.00)	0 (0.0)	0(0.00)	40
Kunikere	6.04	5.54	3.28	20(50.00)	13(32.50)	6(15.00)	0 (0.00)	1(2.50)	0(0.00)	40
Chitradurga	7.65	6.43	4.07	31(38.75)	35(43.75)	11(13.75)	2(2.50)	1(1.25)	0(0.00)	80
Total	5.80	4.96	2.84	93(38.75)	94(39.17)	36(15.00)	12(5.00)	4(1.67)	1(0.42)	240

Source: Primary data, 2018.

Note: Figures in brackets are percentage to row total.

3.6. Sources of irrigation

The main irrigation source of the farmers were tube well (75%), followed by canal (4%), open well (3%), tanks (1%), others (1%). And some of the farmers were mixing two irrigation sources and those are: Open well & tube well (11%), followed by tube well & tank (6%), tube well & tank (0.4%) and tank and canal (0.4%). Majority of the farmers' irrigation source is tube well (75%). Among the districts, Chitradurga district farmers major source is tube well, followed by Tumakuru (67%) district and Hassan. In similar way, tube well is the major source of Kunikere village, followed by Alur (90%) and Vadaluru (74%) and details are presented in Table 3.6.



Field visit Hassan District

Table 3.6. Irrigation source of cultivated land

Name of the Village/ District	One irrigation source					Two irrigation source				Total
	Tube well	Canal	Open well	Tank	Others	Open well & Tube well	Tube well & Tank	Tube well & Tank	Tank & Canal	
Parabhavanahalli	24 (60.0)	0(0.0)	1(2.50)	1(2.50)	0(0.00)	14(35.0)	0(0.00)	0(0.00)	0(0.00)	40
Vadaluru	29(74.3)	0(0.0)	1(2.56)	1(2.56)	1(2.56)	7(17.95)	0(0.00)	0(0.00)	0(0.00)	39
Tumakuru	53(67.1)	0(0.0)	2(2.5)	2(2.5)	1(1.3)	21(26.6)	0(0.00)	0(0.00)	0(0.00)	79
Malenahalli	28(65.1)	7(16.3)	0 (0.00)	0(0.00)	0(0.00)	0(0.00)	7(16.3)	0(0.00)	1(2.3)	43
Nambihalli	23(63.8)	2(5.5)	3(8.33)	0(0.00)	0(0.00)	2(5.56)	6(16.7)	0(0.00)	0(0.00)	36
Hassan	51(64.5)	9(11.4)	3(3.8)	0(0.0)	0(0.0)	2(2.53)	13(16.5)	0(0.00)	1(1.3)	79
Alur	36(90.0)	1(2.5)	1(2.50)	0(0.00)	0(0.00)	1(2.50)	0(0.00)	1(2.5)	0(0.00)	40
Kunikere	38(95.0)	0 (0.0)	0 (0.00)	0(0.00)	0(0.00)	2(5.00)	0(0.00)	0(0.00)	0(0.00)	40
Chitradurga	74(92.5)	1(1.2)	1(1.3)	0(0.0)	0(0.0)	3(3.75)	0(0.00)	1(1.3)	0(0.00)	80
Total	178(74.9)	10(4.2)	6(2.5)	2(0.8)	1(0.4)	26(10.9)	13(5.5)	1(0.4)	1(0.4)	238

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

3.7. Particulars of soil quality and operational holdings

To cultivated land, soil quality is very important. If soil quality is good, one can cultivate any crop in that land. Our study results reveal that nearly half of the farmers land quality is good (51%), followed by average (48%) and poor (1%). Majority of the coconut farmers soil quality is good was observed in Hassan district (63%), followed by Chitradurga (51%) and Tumakuru (38%). Among the villages the soil quality is good in Malenahalli (64%) village, followed by Nambihalli (64%); Alur (51.5%) and Vadaluru (52.50%) and details are presented in **Table 3.7**. One household informed that the soil quality is poor in Vadaluru and Kunikere villages'. There is no much difference (32 acres) between total operational land and total owned lands. The difference between total owned and total operational land is 32 acres (**Table 3.5 &Table 3.7**) an average there was no change much. Hence we have not explained operation land and further information.

3.8. Particulars of coconut land

The total average irrigated land is 3.93 acres. Among the districts, Tumakuru district average coconut irrigated land is little higher (4.83 acres) than Chitradurga (4.63 acres) and Hassan (2.31 acres). Among the villages, Alur (5.44 acres) village average coconut land is higher, followed by Parabhavanahalli (4.88 acres), Vadaluru (4.78 acres) and details are depicted in **Table 3.8 & Figure 3.1**. In similar way, the rain fed coconut average land is higher in Hassan (2 acres) district, followed by Tumakuru (1.42 acres) and Chitradurga (0.50 acres). In the same manner the average total (irrigated +rain fed) coconut land is higher in Chitradurga (4.72 acres) district, followed by Hassan (3.92 acres) and Tumakuru (3.09 acres) (**Table 3.8**).

Table 3.7. Particulars of soil quality and total operation land

Name of the Village/ District	Soil quality of cultivated land				Total operation land		
	Good	Average	Poor	Total	Average Operational land	Average of Irrigated land	Average rain fed land
Parabhavanahalli	10(25.00)	30(75.00)	0(0.00)	40	5.96	5.08	0.88
Vadaluru	21(52.50)	18(45.00)	1(2.50)	40	6.02	5.45	0.56
Tumakuru	31(38.75)	48(60.00)	1(1.25)	80	5.99	5.27	0.72
Malenahalli	27(61.36)	17(38.64)	0(0.00)	44	2.84	2.26	0.58
Nambihalli	23(63.89)	13(36.11)	0(0.00)	36	4.34	3.59	0.75
Hassan	50(62.50)	30(37.50)	0(0.00)	80	3.51	2.85	0.66
Alur	21(52.50)	19(47.50)	0(0.00)	40	9.00	7.26	1.74
Kunikere	20(50.00)	19(47.50)	1(2.50)	40	5.98	5.54	0.44
Chitradurga	41(51.25)	38(47.50)	1(1.25)	80	7.49	6.40	1.09
Total	122(50.83)	116(48.33)	2(0.83)	240	5.66	4.84	0.82

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

Table 3.8. How much coconut irrigated land do you have? (Acres)

Name of the Village/ District	Average Irrigated land	Average rain fed land	Total coconut land (irrigated +rain fed)	Average coconut land (irrigated +rain fed)
Parabhavanahalli	4.88	1.63	207.10	2.59
Vadaluru	4.78	1.78	96.00	2.18
Tumakuru	4.83	1.42	111.10	3.09
Malenahalli	1.86	2.57	388.44	4.86
Nambihalli	2.85	2.80	231.59	5.79
Hassan	2.31	2.00	156.85	3.92
Alur	5.44	0.50	384.23	4.80
Kunikere	3.82	NA	195.30	4.88
Chitradurga	4.63	0.50	188.93	4.72
Total	3.93	1.67	979.77	4.08

Source: Primary data, 2018.

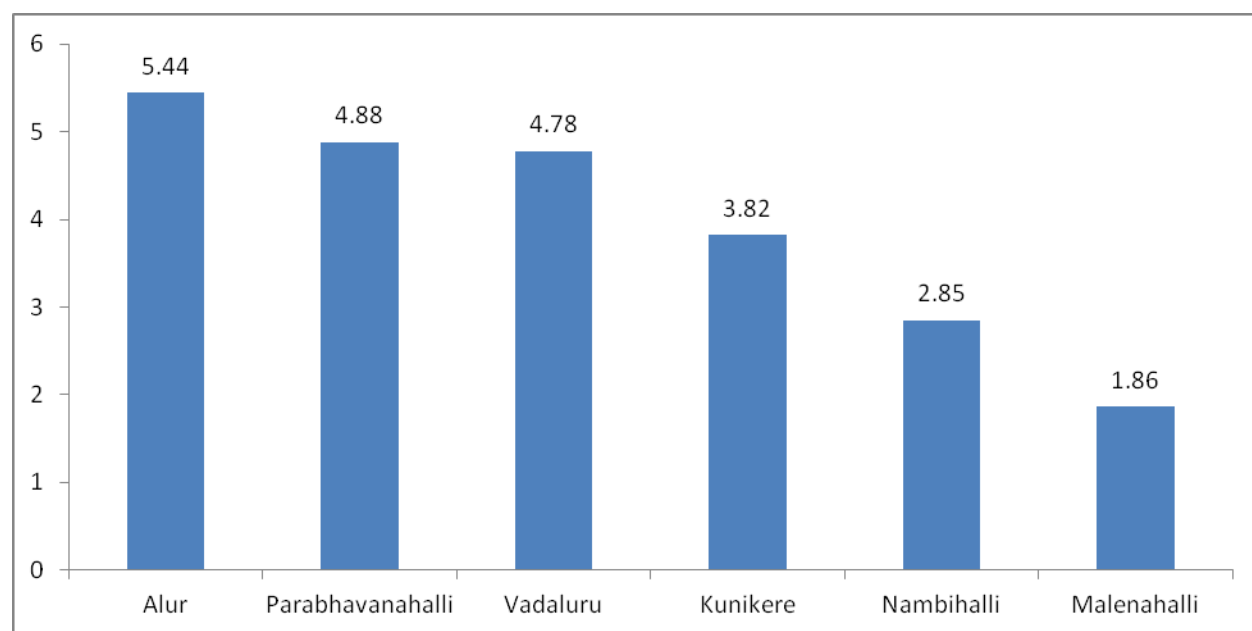


Figure 3.1. Average coconut irrigated land (acres)

3.9. Sources of income

The agricultural income contributed in a significant manner among the activities. Among the activities, the highest average income comes from agricultural sector in Vadaluru village (₹.4,45,975), followed by Parabhavanahalli (₹.4,04,750) and the lowest income came from Malenahalli village (₹.89,227) and details are presented in Table 3.9. The share of agriculture income is higher in Chitradurga (92%) district followed by Hassan ((88%) and

Tumakuru (87%). In similar way, the share of agriculture income is higher in total income in Kunikere (95%) village, followed by Alur (90%) and lowest agriculture share in total income is Parabhavanahalli (86%). The highest second income comes from service sector (7%), followed by dairy & animal husbandry (3%), other sources (1%) and self business (0.46%).

We asked the coconut farmers' regarding income increase over the past five years; and the majority (55%) of the farmers reported that the income has increased. And this opinion was reported by many households in Tumakuru (77%) district, followed by Chitradurga (65%) and very less farmers reported in Hassan (24%) district. In similar, way, among the villages, Parabhavanahalli (82%) village more coconut farmers reported that income has been increased, followed by Vadaluru (73%). In contrary that, income has been reduced was reported by many farmers in Hassan district (76%). Among the villages income declined are: Malenahalli (33) and Nambihalli (28). In case of dairy activity, majority (73%) of the farmers reported that income has been increased over past five years. And this increase is higher in Tumakuru (93%) district, followed by Hassan (64%) and Chitradurga (43%). In case of service sector also the income increased reported by farmers in Tumakuru (6) district. All the relevant income increase information is furnished in Table 3.9.



Field visit Tumakuru District

Table 3.9. Particulars of income from different activities

Name of the Village/ District	Average income in different activities						Do you think income has increased over the past five years?								
	Agric- ulture	Services	Dairy & animal husbandry	Other sources	Self- Busin- ess	Total average Income	Agriculture			Dairy			Service		
							Yes	No	Total	Yes	No	Total	Yes	No	Total
Parabhavanahalli	404750 (85.75)	400000 (10.59)	76756 (3.66)	0 (0.00)	0 (0.00)	472020	32 (82.05)	7 (17.95)	39	8 (88.89)	1 (11.11)	9	3 (60.0)	2 (40.0)	5
Vadaluru	445975 (88.01)	299200 (7.38)	93500 (2.77)	240000 (1.18)	67000 (0.66)	506750	29 (72.50)	11 (27.50)	40	6 (100)	0 (0.00)	6	3 (60.0)	2 (40.0)	5
Tumakuru	425363 (86.92)	349600 (8.93)	83453 (3.20)	240000 (0.61)	67000 (0.34)	489385	61 (77.22)	18 (22.78)	79	14 (93.3)	1 (6.67)	15	6 (60.0)	4 (40.0)	10
Malenahalli	89227 (89.72)	20000 (0.46)	100000 (9.14)	10000 (0.23)	20000 (0.46)	99455	11 (25.00)	33 (75.00)	44	3 (75.00)	1 (25.00)	4	0 (0.00)	1 (100)	1
Nambihalli	131806 (86.11)	0 (0.00)	28646 (3.64)	280000 (10.16)	0 (0.00)	153070	8 (22.22)	28 (77.78)	36	4 (57.14)	3 (42.86)	7	NA	NA	NA
Hassan	108388 (87.71)	20000 (0.20)	54593 (6.07)	190000 (5.77)	20000 (0.20)	123582	19 (23.75)	61 (76.25)	80	7 (63.64)	4 (36.36)	11	0 (0.00)	1 (100)	1
Alur	165015 (90.29)	183333 (7.52)	37500 (2.05)	0 (0.00)	10000 (0.14)	182765	25 (62.50)	15 (37.50)	40	2 (50.00)	2 (50.00)	4	1 (33.3)	2 (66.7)	3
Kunikere	122350 (95.33)	0 (0.00)	40000 (2.34)	0 (0.00)	60000 (2.34)	128350	27 (67.50)	13 (32.50)	40	1 (33.33)	2 (66.67)	3	NA	NA	NA
Chitradurga	143683 (92.37)	183333 (4.42)	38571 (2.17)	0 (0.00)	43333 (1.04)	155558	52 (65.00)	28 (35.00)	80	3 (42.86)	4 (57.14)	7	1 (33.3)	2 (66.7)	3
Total	225811 (88.15)	290429 (6.61)	64313 (3.45)	202500 (1.32)	47333 (0.46)	256175	132 (55.2)	107 (44.7)	239	24 (72.7)	9 (27.27)	33	7 (50.0)	7 (50.0)	14

Source: Primary data, 2018. Note: Figures in brackets are share in total income.

3.10. Details of credit

Farmer requires money for cultivation of land. Without money, cultivation of land is very difficult. Majority of the Indian farmers are approaching institutional/non-institutional sources to get loan. Bankers are also willing to provide the loans for the farmers, but the formalities are required to get institutional sources. In our study, most of the farmers were availed loan from the institutional sources. Farmers who are availed loan from co-operative society/bank is higher, as compared to commercial banks and others. Majority of the Hassan (33) district farmers availed more loans from cooperative society/bank, followed by Tumakuru (29) and Chitradurga (28). Among the villages Vadaluru (19) village farmers availed more loans from co-operative society/bank, followed by Malenhalli (18), Nambihalli (15) and Kunikere (15). In similar way, the average amount borrowed from co-operative society/bank is higher in Tumakuru (₹.1,60,690) district, followed by Hassan (₹.83,939) and Chitradurga (₹.70,357). Among the villages, borrowed average amount is very high in Vadaluru (₹.1,79,474), followed by Parabhavanahalli (₹.1,25,000) and the lowest average amount borrowed by Kunikere (₹.46,000) village. The average outstanding amount is very high in Tumakuru (₹.89,821) district, followed by Hassan (₹.82,931) and Chitradurga (₹.71,111). In similar way, among the villages, average outstanding amount is very high in Vadaluru (₹.1,03,056), followed by Alur (₹.1,02,500) and Malenahalli (₹.83,750); and the lowest outstanding amount in Kunikere (₹.46,000) village (Table 3.10). The borrowed total loan was repaid by only six farmers and one farmer belongs to Tumakuru district/Vadaluru village and another four farmers belong to Hassan district (Malenahalli-2 and Nambihalli-2), and one farmer repaid loan in Chitradurga district/Alur. Almost all (except 2) farmers took loan for agricultural purpose and two farmers took loan for non-agriculture purpose.

Some (76) of the coconut farmers are borrowed loan from commercial banks (including RRBs). And most of the borrowed farmers come from Hassan (33) district, followed by Chitradurga (25) and Tumakuru (18). In similar way, among the borrowed farmers, most of the farmers come from Nambihalli village (21), followed by Alur (17) and lowest farmers comes from Parabhavanahalli (8) and Kunikere (8). The borrowed average amount is higher in Tumakuru (₹.2,58,056) district, followed by Chitradurga (₹.2,25,600) and Hassan (₹.1,39,939). But, outstanding amount is very high in Chitradurga (₹.2,21,600) district, followed by Tumakuru (₹.1,61,250) and Hassan (₹.1,40,000). In similar way, borrowed and outstanding amount is not repaid by Alur (₹.2,51,176) village, followed by Vadaluru (₹.2,33,125) and the lowest

outstanding is represented by Parabhavanahalli (₹.89,375). So far only three farmers repaid full loan amount and remaining farmers due is pending at the time of our interview. The agriculture purpose coconut farmers availed loan, but two farmers availed non-agriculture purpose. Very few (14) of the farmers are borrowed money from other sources. An average borrowed amount is ₹.2,12,857 and the average amount outstanding is ₹.2,05,714. Whoever taken loan from other source, so far no farmer repaid full loan amount during study period. Almost all farmers had taken loan for agriculture purpose and another two farmers taken for non-agriculture purpose.

The institutional average borrowed amount is higher in Chitradurga (₹.1,31,750) district followed by Tumakuru (₹.1,62,313) and Hassan (₹.92,975). At the same time, the institutional borrowed amount is higher in Alur (₹.1,96,250) village, followed by Vadaluru (₹.1,69,375) and the lowest borrowed amount village is Parabhavanahalli (₹.63,250). The average outstanding amount is higher in Chitradurga (₹.1,28,625) district, followed by Hassan (₹.86,688) and Tumakuru (₹.63,688). In similar way, among the villages, the outstanding average amount is higher in Allur (₹.1,95,000), Nambihalli (₹.1,11,389), followed by Vadaluru (₹.93,000) and the lowest outstanding amount come from Parabhavanahalli (₹.34,375). At the time of our study, only six farmers repaid full loan amount and remaining coconut farmers due is pending (Table 3.10).

Very few of the coconut farmers borrowed money from land lords (10), Moneylenders (10) and others (23) and these are all from non-institutional sources. The land lord borrowed average amount is very high in Tumakuru (₹.92,500) district, followed by Chitradurga (₹.50,000) and Hassan (₹.35,000). In similar way, the land lord borrowed average amount is very high in Vadaluru (₹.1,24,000) village, followed by Alur (₹.50,000) and the average lowest amount is Malenahalli (₹.35,000) village. The outstanding amount is very high in Chitradurga (₹.50,000) district, followed by Hassan (₹.35,000) and Tumakuru (₹.25,714). But the total landlord loan repaid by only one farmer and belongs to Tumakuru/Vadaluru. For agriculture purpose all farmers took loan.

Few of the Tumakuru (9) district farmers availed loan from money lenders and their average borrowed amount is ₹.1,34,444 and their outstanding amount is ₹.52,500. In the similar way in different other sources borrowed amount is very high in Chitradurga (₹.3,00,000), followed by Hassan (₹.84,231) and Tumakuru (₹.72,778). And the outstanding amount is very high in

Chitradurga (₹.3,00,000) district, followed by Tumakuru (₹.69,375) and Hassan (₹.56,846). The loan amount borrowed is highest in Alur (₹.3,00,000) and outstanding amount also is very high in same village and the farmer did not repay the loan even single rupee. All farmers used loan amount for agriculture.

The total non-institutional average loan amount is higher in Chitradurga (₹.2,10,000) district, followed by Tumakuru (₹.1,08,200) and Hassan (₹.1,00,588). But the outstanding average amount was also higher in Chitradurga district (₹.2,10,000) followed by Hassan (₹.75,235) and Tumakuru (₹.52,300). In village wise, the average loan borrowed amount is higher in Alur (₹.2,10,000) village, followed by Vadalur (₹.1,12,857) and outstanding amount is also higher in Alur (₹.2,10,000) village followed by Malenahalli (₹.91,875). The non-institutional total loan amount is repaid by only one farmer and belongs to Tumakuru/Vadaluru(Table 3.11).



Field visit Chitradurga District

Table 3.10. Average amount institutional credit

Name of the Village/ District	a. Co-operative Society/bank				b .Commercial banks including RRBs				c. Others				Institutional	
	Amount borrowed	Outstandin g amount	Purpose of loan		Amount borrowed	Outstandin g amount	Purpose of loan		Amount borrowed	Outstandin g amount	Purpose of loan		Borrowed amount	Outstandin g amount
			1*	2**			1*	2**			1*	2**		
Parabhavanahalli	125000 (10)	66000 (10)	10	1	160000 (8)	89375 (8)	8	0	NA	NA	NA	NA	63250 (18)	34375 (18)
Vadaluru	179474 (19)	103056 (18)	19	0	336500 (10)	233125 (8)	10	0	NA	NA	NA	NA	169375 (29)	93000 (26)
Tumakuru	160690 (29)	89821 (28)	28	1	258056 (18)	161250 (16)	18	0	NA	NA	NA	NA	116313 (55)	63688 (44)
Malenahalli	86944 (18)	83750 (16)	17	1	134583 (12)	127917 (12)	12	0	50000 (1)	50000 (1)	NA	1	73409 (27)	66477 (26)
Nambihalli	80333 (15)	81923 (13)	15	0	143000 (21)	147250 (20)	20	1	NA	NA	NA	NA	116889 (28)	111389 (16)
Hassan	83939 (33)	82931 (29)	32	1	139939 (33)	140000 (32)	32	1	50000 (1)	50000 (1)	NA	1	92975 (55)	86688 (52)
Alur	98462 (13)	102500 (12)	13	0	251176 (17)	251176 (17)	15	2	287500 (8)	287500 (8)	7	1	196250 (30)	195000 (30)
Kunikere	46000 (15)	46000 (15)	15	0	171250 (8)	158750 (8)	5	2	126000 (5)	106000 (5)	5	NA	67250 (26)	62250 (26)
Chitradurga	70357 (28)	71111 (27)	28	0	225600 (25)	221600 (25)	21	4	225385 (13)	217692 (13)	12	1	131750 (56)	128625 (56)
Total	104444 (90)	81429 (84)	88	2	196092 (76)	172603 (73)	71	5	212857 (14)	205714 (14)	12	2	113679 (158)	93000 (152)

Source: Primary data, 2018. Note: Figures in brackets are total farmers availed loan. *Agriculture; **Non-agriculture;

Table 3.11. Average non-institutional credit

Name of the Village/ District	a. Landlord		Purpose of loan*	b. Money lenders		Purpose of loan*	c. Others		Purpose		Non-Institutional	
	Amount borrowed	Outstanding amount		Amount borrowed	Outstanding amount		Amount Borrowed	Outstanding amount	1*	2**	Amount Borrowed	Outstanding amount
Parabhavanahalli	40000 (3)	20000 (3)	3	131667 (6)	41667 (6)	6	71667 (3)	35000 (2)	2	1	102273 (11)	34545 (11)
Vadaluru	124000 (5)	30000 (4)	5	140000 (3)	74167 (3)	3	73333 (6)	80833 (6)	6	NA	112857 (14)	66250 (13)
Tumakuru	92500 (8)	25714 (7)	8	134444 (9)	52500 (9)	9	72778 (9)	69375 (8)	8	1	108200 (25)	52300 (24)
Malenahalli	35000 (1)	35000 (1)	1	30000 (1)	30000 (1)	1	58333 (6)	45000 (6)	3	3	101875 (8)	91875 (8)
Nambihalli	NA	NA	NA	NA	NA	NA	106429 (7)	67000 (7)	5	2	99444 (9)	60444 (9)
Hassan	35000 (1)	35000 (1)	1	30000 (1)	30000 (1)	1	84231 (13)	56846 (13)	8	5	100588 (17)	75235 (17)
Alur	50000 (1)	50000 (1)	1	NA	NA	NA	300000 (1)	300000 (1)	1	NA	210000 (2)	210000 (2)
Chitradurga	50000 (1)	50000 (1)	1	NA	NA	NA	300000 (1)	300000 (1)	1	NA	210000 (2)	210000 (2)
Total	82500 (10)	29444 (9)	10	124000 (10)	50250 (10)	10	89130 (23)	72455 (22)	17	6	109886 (44)	68330 (430)

Source: Primary data, 2018.

Note: Figures in brackets are total farmers availed loan.

*Agriculture purpose; ** Non-agriculture purpose

COCONUT PRODUCTION

Chapter 4 explains about the importance of mixed crop, cultivation of inter crop, coconut trees, coconut production like tender coconut, dry coconut, copra, leaves, trunk, coconut total income (average income), cost of cultivation like seedling cost, water charges, fertilizer and pesticides, labour cost and transportation cost are explained below.

4.1. Cultivation of mixed crop

Jana (2015) explained the importance of coconut crop in Indian agriculture. He mentioned that a combination of inter-crops and mixed crops cultivated collectively are referred to as a multi-storeyed cropping system. Our study data reveals that half of the coconut farmers cultivated along with mixed crop during study period. The mixed crop cultivation is higher in Tumakuru (85%) district, followed by Chitradurga (42%) and Hassan (23%). In the same way the mixed crop cultivation is very high in Vadaluru (90%) village, followed by Parabhavanahalli (80%) and Alur (45%) and details are depicted in **Figure 4.1**. The total 119 (50%) farmers cultivated mixed crops in study period. Against this, half of (50%) the coconut farmers did not cultivate mixed crop during the reference period. The coconut farmers cultivated along with mixed crops are: Arecanut (78%), ragi (9%), maize (8%), sugarcane (2%), banana (2%), cotton (1%) and paddy (1%). The Areca nut crop was cultivated more in Tumakuru (97%) district, followed by Chitradurga (82%). Village wise arecanut crop was cultivated more in Vadaluru (34 farmers) followed by Parabhavanahalli (32 farmers). Ragi crop total were cultivated by 11 farmers and most of them were in Hassan (9) district and they belong to Malenahalli (5 farmers) and Nambihalli (4 farmers) villages. In similar way maize also cultivated by nine farmers and most of the Hassan district farmers who cultivated during the study period, the details are presented in **Table 4.1**.

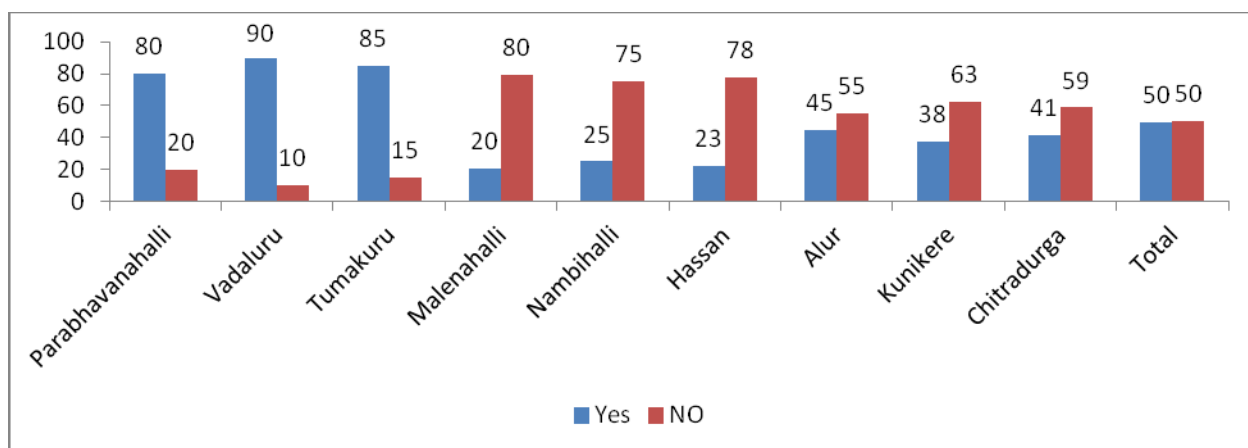


Figure 4.1: Coconut farmers cultivated mixed crops

Table 4.1. Coconut crop along with mixed crop during study period

Name of the Village/ District	Arecanut	Ragi	Maize	Sugarcane	Banana	Cotton	Paddy	Total
Parabhavanahalli	32(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	32
Vadaluru	34 (94.4)	1(2.7)	0(0.0)	0(0.0)	1(2.7)	0(0.0)	0(0.0)	36
Tumakuru	66 (97.1)	1 (1.5)	0(0.0)	0(0.0)	1(1.4)	0(0.0)	0(0.0)	68
Malenahalli	0(0.00)	5(55.5)	3(33.3)	1(11.1)	0(0.0)	0(0.0)	0(0.0)	9
Nambihalli	0(0.00)	4(44.4)	3(33.3)	1(11.1)	0(0.0)	0(0.0)	1 (11.1)	9
Hassan	0(0.00)	9(50.0)	6(33.3)	2(11.1)	0(0.0)	0(0.0)	1(5.5)	18
Alur	16 (88.9)	0(0.0)	1(5.5)	0(0.0)	1(5.5)	0(0.0)	0(0.0)	18
Kunikere	11(73.3)	1 (6.6)	2(13.3)	0(0.0)	0(0.0)	1(6.6)	0(0.0)	15
Chitradurga	27(81.8)	1(3.03)	3(9.2)	0(0.0)	1(3.1)	1(3.1)	0(0.0)	33
Total	93(78.1)	11(9.2)	9(7.5)	2(1.6)	2(1.6)	1(0.8)	1(0.8)	119

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

4.2. Cultivation of intercrop

Forty-seven per cent of the farmers cultivated intercrop during study period. Among the farmers, Tumakuru (66%) farmers practiced more in intercrop, followed by Chitradurga (59%) and Hassan (15%). In similar way the inter crop cultivated was higher in Vadaluru (75%), village followed by Parabhavanahalli (57.5%). In the opposite way, the inter crops were not cultivated due to their coconut crop grown and rest of the farmers cultivated in mixed crop. The main intercrops are: Areca nut (98 farmers), maize (six farmers), ragi (six farmers), sugarcane (one farmer) and banana (one farmer). The arecanut cultivated farmers are more in Tumakuru (98%) district as compared to other two districts namely; Chitradurga (98%) and Hassan district not cultivated inter crop during study period. In similar way, maize and ragi in each crop, only six farmers cultivated (Table 4.2).

Table 4.2. Particulars of inter crop

Name of the Village/ District	Did you cultivate coconut crop along with inter crop during study period			Name of the inter crop cultivated during study period					
	Yes	No	Total	Areca nut	Maize	Ragi	Sugarcane	Banana	Total
Parabhavanahalli	23(57.50)	17(42.50)	40	23(100)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	23
Vadaluru	30 (75.00)	10 (25.00)	40	29(96.67)	0(0.00)	1(3.33)	0(0.00)	0(0.00)	30
Tumakuru	53 (66.25)	27 (33.75)	80	52(98.11)	0(0.00)	1(1.89)	0(0.00)	0(0.00)	53
Malenahalli	6(13.64)	38 (86.36)	44	0(0.00)	2(33.33)	2(33.33)	1(16.67)	1(16.67)	6
Nambihalli	6 (16.67)	30 (83.33)	36	0(0.00)	4(66.67)	2(33.33)	0(0.00)	0(0.00)	6
Hassan	12 (15.00)	68 (85.00)	80	0(0.00)	6(50.00)	4(33.33)	1(8.33)	1(8.33)	12
Alur	29(72.50)	11 (27.50)	40	29(100)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	29
Kunikere	18(45.00)	22 (55.00)	40	17(94.44)	0(0.00)	1(5.56)	0(0.00)	0(0.00)	18
Chitradurga	47 (58.75)	33 (41.25)	80	46(97.87)	0(0.00)	1(2.13)	0(0.00)	0(0.00)	47
Total	112 (46.67)	128(53.33)	240	98(87.5)	6(95.36)	6(5.36)	1(0.89)	1(0.89)	112

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

4.3. Coconut trees

In study area the total cultivated land is 964 acres and 38,908 coconut trees were growing at the time of our study in all selected villages. The coconut average land is higher in Tumakuru (4.78 acres) district, followed by Chitradurga (4.82 acres) and Hassan (2.45 acres). In village wise, the average coconut land is higher in Alur (5.74 acres) village, followed by Parabhavanahalli (4.88 acres), and Vadaluru (4.69 acres). The average coconut land is low in Malenahalli (2.03 acres) village as compared to other villages. The average per acre coconut trees are higher in Chitradurga (43) district, followed by Tumakuru (39) and Hassan (38). In the same manner, the average per acre coconut trees were growing higher in Alur (44), followed by Kunikere (40) and Vadaluru (40) (Table 4.3). Most of the farmers were getting coconut production since 50 years. But it differs from farmer to farmer and village to village.

Table 4.3. Coconut trees in cultivated land

Name of the Village/ District	Total coconut trees	Total coconut land cultivated	Average land	Average per acre coconut trees planted
Parabhavanahalli	7538	195	4.88	38.60
Vadaluru	7535	187	4.69	40.20
Tumakuru	15073	383	4.78	39.38
Malenahalli	3420	90	2.03	38.21
Nambihalli	3990	106	2.95	37.61
Hassan	7410	196	2.45	37.88
Alur	10105	230	5.74	44.01
Kunikere	6320	156	3.91	40.42
Chitradurga	16425	386	4.82	42.56
Total	38908	964	4.02	40.35

Source: Primary data, 2018.

4.4. Coconut production

Production is very important for the farmer. Without coconut production, sustainability is very difficult for farmers. When production increases, automatically income also increases and this leads to development of the farmer. Our study results reveal that 95 per cent of the farmers received production during study and whereas five per cent of the farmers were not getting production due to coconut trees having not reached yield stage and the results are presented in Table 4.4. Abraham Aswini (2016) explained the importance of coconut milk. The coconut milk is used in all allergies medicines. The coconut milk is useful to all age group people. Coconut milk is used for new born babies for drinking purposes. The milk is helpful for

diabetes, obesity, gall bladder diseases, pancreatitis, crohn's diseases. In our study results show that only one farmer obtained 1000 liters of coconut neera and he sold (neera) to cooperative and earned income ₹.15000/- during study period. Rajendran (2002) study finds that neera is tapped on a large scale, and within stipulated time it has to be consumed otherwise it will be intoxicant and sometimes poisonous. Another study (Sreekumar et al.,) expressed that the importance of coconut and its neera product. According to study coconut is not just an oilseed crop, but also it is potential and useful for value addition. The study stressed about the coconut neera and the uses of neera in many ways like highly nutritive value, delicious taste and pleasant flavor, an appetizing health drink. And also it is good for digestion, facilitates clear urination and prevents jaundice. The study observed that more value addition is getting in coconut neera. In the same manner the authors expressed that neera is having good market in the country and abroad.

Table 4.4. Did you get coconut production in last year?

Name of the Village/ District	Yes	No	Total
Parabhavanahalli	39(97.50)	1(2.50)	40
Vadaluru	40(100)	0(0.00)	40
Tumakuru	79(98.75)	1 (1.25)	80
Malenahalli	41(93.18)	3 (6.82)	44
Nambihalli	32 (88.89)	4(11.11)	36
Hassan	73(91.25)	7(8.75)	80
Alur	39(97.50)	1 (2.50)	40
Kunikere	38 (95.00)	2(5.00)	40
Chitradurga	77 (96.25)	3 (3.75)	80
Total	229 (95.42)	11 (4.58)	240

Source: Primary data, 2018.

Note: Figures in brackets are percentage to row total.

4.4.1. Particulars of tender coconut

According to Salum (2016) coconut is helpful to many diseases like cancer cells, neurological disorders like Alzheimer's, lifestyle disease like diabetes and viral diseases such as HIV/Aids. In general, the tender coconut is useful to the human beings for drinking and it also helps to control loose motion and thirstiness in human beings. Because of these reasons most of the people drink tender coconut. Eating tender coconut is good for health. According to Jana (2015) about 50 per cent of the production of the coconut consumed as fresh nuts out of which nearly 10 per cent of the production is used for industrial raw material and rest of

them used for other social, religious ritual and edible purposes. Nearly five per cent of the coconut production utilized as tender coconut. According to our study, 12 farmers sold their tender coconut during study period. Among 12 farmers, eight farmers come from Tumakuru district, followed by Chitradurga (3) and Hassan (1). In the same way, eight farmers sell their tender coconut in Parabhavanahalli village followed by Kunikere village (Table 4.5). The coconut crop productivity is varying from farmer to farmer and district to district. Our study results reveal that the per acre coconut tender coconut productivity is 1443. But, the Chitradurga district coconut productivity is higher as compared to Hassan (1684) and Tumakuru (1377). And the village wise, Alur (2500) productivity is higher, followed by Nambihalli (1667).

In selected sample households, 75,500 tender coconuts sold during study period. The average sold tender coconut income is higher in Tumakuru (₹.7,063) district, followed by Chitradurga (₹.5,333) and Hassan (₹.3,000). By village wise, the highest tender coconut is sold by Parabhavanahalli (₹.7,063), followed by Kunikere (₹.5,500). The average coconut cost depends on the season and time. In general, during summer season, the coconut cost is higher than the winter and rainy seasons. And also the tender coconut cost depends upon the production of the coconut. If production is more the tender coconut cost is obviously decreased and the production is less and the cost may increase. Our study results indicate that, in Hassan (₹.13) district tender coconut cost is higher than Chitradurga (₹.11) and Tumakuru (₹.10). In village wise, the tender coconut cost is higher in Kunikere (₹.14) village, followed by Nambihalli (₹.13) and the lowest is in Alur (₹.5) village.

The average net returns are higher in Tumakuru(₹.69,844) district, followed by Chitradurga (₹.59,333) and Hassan (₹.39,000). In similar way, the highest average net returns come from Kunikere (₹.76,500), followed by Parabhavanahalli (₹.69,844). The tender coconut production sold to cooperative society (8), followed by wholesaler (2), modern retail chains (1) and local vendor (1). District wise, Tumakuru district (8)/ Parabhavanahalli (8) farmers sold their tender coconut to cooperative society. In the case of Chitradurga/Kunikere farmers sold their tender coconut to wholesaler (2) and Hassan/ Nambihalli (1) sold their tender coconut to modern retail chains. But in Chitradurga/ Alur farmer sold their tender coconut production to local vendor (Table 4.5).

Table 4.5. Particular of tender coconut

Name of the Village/ District	Did you sell tender coconut?			Average per acre tender coconuts (productivity)	Average tender coconut sold	Tender Coconut net returns		To whom you sold				
	Yes	No	Total			Average per tender coconut cost?	Average tender coconut amount	Cooperatives	Whole seller	Modern Retail Chains	Local vendor	Total
Parabhavanahalli	8 (20.0)	32 (80.00)	40	1376.7	7062.5	10	69843.8	8(100)	0(0.00)	0(0.00)	0(0.00)	8
Vadaluru	0 (0.00)	40 (100)	40	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tumakuru	8 (10.0)	72 (90.00)	80	1376.7	7062.5	10	69843.8	8(100)	0(0.00)	0(0.00)	0(0.00)	8
Malenahalli	0(0.00)	44 (100.0)	44	NA	NA	N	NA	NA	NA	NA	NA	NA
Nambihalli	1 (2.78)	35 (97.22)	36	1666.7	3000.0	13	39000.0	0(0.00)	0(0.00)	1(100)	0(0.00)	1
Hassan	1(1.25)	79 (98.75)	80	1666.7	3000.0	13	39000.0	0(0.00)	0(0.00)	1(100)	0(0.00)	1
Alur	1 (2.50)	39 (97.50)	40	2500.0	5000.0	5	25000.0	0(0.00)	0(0.00)	0(0.00)	1(100)	1
Kunikere	2 (5.00)	38 (95.00)	40	1466.7	5500.0	14	76500.0	0(0.00)	2(100)	0(0.00)	0(0.00)	2
Chitradurga	3 (3.75)	77 (96.25)	80	1684.2	5333.3	11	59333.3	0(0.00)	2(66.7)	0(0.00)	1(33.3)	3
Total	12 (5.0)	228 (95.0)	240	1442.5	6291.7	11	64645.8	8(66.7)	2(16.7)	1(8.33)	1(8.33)	12

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

4.4.2. Particulars of dry coconut

Human beings are using dry coconut by offering to gods/puja purposes. Some people use dry coconut for new ceremony purpose and consuming in cooking. To get more taste people are using dry coconut in their delicious curries /samber/rasam. Salum (2016) emphasized the importance on coconut. According to the study, nearly 90 countries cultivated the coconut crop in the world, mainly concentration in developing countries and especially in coastal regions. In general, coconut used as food consumption in many ways; like virgin coconut oil, coconut water, coconut milk, coconut milk powder, coconut flour, coconut sugar and other by product also used in different purpose. Our study sample households sold their dry coconut (59%). Majority of the Chitradurga (87%) district farmers sold their dry coconut production, followed by Hassan (67%) and Tumakuru (21%). In village wise, Alur (90%) farmers sold more dry coconut, followed by Kunikere (85%) and Malenahalli (70%) village. The coconut dry productivity is varying from district to district. The dry coconut per acre productivity (nuts) is higher in Tumakuru (2,344) district, followed by Chitradurga (1,676) and Hassan (1,371). In same manner, the per acre productivity is higher in Parabhavanahalli (3,909), followed by Kunikere (1,901). The average dry coconut cost is varying from place to place and region to region and State to State. During festival time the dry coconut cost is little higher as compared to other seasons. The total dry coconut average cost is ₹.16. But the district wise dry coconut cost is different. Among the districts, Hassan (₹.22) district dry coconut cost is very higher, followed by Tumakuru (₹.14) and Chitradurga (₹.11). In village wise, the dry coconut cost is very high in Malenahalli (23), followed by Nambihalli (20) and Vadaluru (16). The net returns are different from farmer to farmer. If farmer gets more production and in the market prices are high then he/she will get good price. Even though if production is more but market prices are less, there is a possibility to get less amount. Our study results reveal that the total average dry coconut net returns is ₹.84,297. The average dry coconut net returns are higher in Tumakuru (₹.1,18,961) district, as compared to Chitradurga (₹.92,151) and Hassan (₹.63,204). Village wise, the dry coconut net returns are very high in Parabhavanahalli (₹.1,48,727), Alur (₹.1,08,086) and Kunikere (₹.75,279). After receiving the dry coconut production, selling is also very important to the coconut farmer. If a farmer can sell his/her output to suitable people there is a possibility to get good income. Most of the farmers are not aware about to whom they have to sell their output. Farmers are selling their dry coconut in different markets. Our study results reveal that some (38%) of the farmers sold

their output to wholesaler (38%), followed by local vendor (22%), cooperatives (21%) and commission agent cum wholesaler (20%) (Table 4.6).

4.4.3. Particulars of copra

In general, copra is useful for cooking in curries. Most of the people eat copra. Copra is very tasty in manner. If one eats copra with jaguar, taste it will be very good. The copra comes from dry coconut. After collection of dry coconut, farmers (they) have to keep in store room. Over a period of time whatever the dry coconut having water will get dried up. Then by removing the shell, we are able to get copra. Commission for Agricultural Costs and Prices (2015) focused on the price policy for copra during 2016 season. The report explained that 92 per cent of the mature raw nuts were consumed for domestic purposes and rest of eight per cent is used by industry for different activities. According to our study, 36 per cent of the farmers were sold the copra during study period. Most of the Tumakuru (71%) district farmers sold copra followed by Hassan (28%) and Chitradurga (10%). Village wise, copra is sold by Vadaluru (90%) village, followed by Parabhavanahalli (53%) and Nambihalli (39%). The per acre of copra (productivity) is higher in Tumakuru (6.3 qtl) district, followed by Hassan (3.7 qtl) and Chitradurga (3.5qtl). And village wise, Parabhavanahalli (7.8qtl) productivity is higher followed by Alur (5.8qtl). The study (Commission for Agricultural Costs and Prices,2015) observed that some districts are Malappuram, Kasaragod and Thiruvananthapuram in Kerala; Dakshina Kannada, Chitradurga and Mandya in Karnataka; West Godavari, Srikakulam and Krishna in Andhra Pradesh and Krishnagiri, Thanjavur and Thiruvarur in Tamil Nadu were getting good yield and higher productivity as compared to their respective States average. The copra average per quintal amount (Qtl) depends on many factors like: quality of the copra (grading), size of the copra, colour of the copra and taste of the copra. According to our study, the average per quintal copra amount is ₹.9,597. The per Qtl copra average amount is higher in Tumakuru (₹.10,139) district, followed by Hassan (₹.8,682) and Chitradurga (₹.8,250). Village wise, the copra Qtl is higher in Vadaluru (₹.10,306) village, followed by Nambihalli (₹.10,286) and Parabhavanahalli (₹.9,852). The copra net returns (income) are higher in Tumakuru district (₹.3,21,791) followed by Chitradurga (₹1,39,188) and Hassan (₹.1,14,795). Village wise, the highest net returns received by Parabhavanahalli (₹.4,12,171) village, Vadaluru (₹.2,69,069) and Kunikere (₹.1,53,500) village. Most of the study coconut farmers sold their coconut production to Co-operative societies (85%), followed by wholesaler (10%) and commission agent cum wholesaler (5%) (Table 4.7).

Table 4.6. Particulars of dry coconut

Name of the Village/ District	Did you sell dry coconut?			Average per acre dry coconuts (productivity)	Average dry per Coconut cost?	Average coconut income	To whom sold				
	Yes	No	Total				Commission agent cum wholesaler	Wholesaler	Cooperatives	Local vendor	Total
Parabhavanahalli	11(27.50)	29(72.50)	40	3908.5	12.8	148727.27	0(0.0)	0 (0.0)	7(63.6)	4(36.4)	11
Vadaluru	6 (15.00)	34(85.00)	40	796.7	16.0	64390.0	0(0.0)	1(16.7)	2(33.3)	3(50.0)	6
Tumakuru	17(21.25)	63(78.75)	80	2344.1	13.9	118961.18	0(0.0)	1(5.9)	9(52.9)	7(41.2)	17
Malenahalli	31 (70.45)	13(29.55)	44	1361.6	22.9	60516.13	0(0.0)	19(61.3)	10(32.3)	2(6.5)	31
Nambihalli	23 (63.89)	13(36.11)	36	1381.0	20.3	66826.09	1(4.3)	12(52.2)	4 (17.4)	6 (26.1)	23
Hassan	54 (67.50)	26(32.50)	80	1370.7	21.8	63204.43	1(1.9)	31(57.4)	14(25.9)	8 (14.8)	54
Alur	36 (90.00)	4(10.00)	40	1549.2	11.6	108086.11	11(30.6)	13(36.1)	5 (13.9)	7 (19.4)	36
Kunikere	34 (85.00)	6(15.00)	40	1900.5	10.8	75279.41	16(47.1)	8(23.5)	1(2.9)	9 (26.5)	34
Chitradurga	70 (87.50)	10(12.50)	80	1676.1	11.2	92151.7	27(38.6)	21(30.0)	6 (8.6)	16(22.9)	70
Total	141(58.75)	99(41.25)	240	1690.1	15.6	84297.45	28(19.9)	53(37.6)	29(20.6)	31(22.0)	141

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

Table 4.7. Particulars of copra

Name of the Village/ District	Did you sell only copra?			Average per acre copra (productivity) (qtl)	Average copra cost? (Per Qtl)	Average copra sold amount	To whom sold			
	Yes	No	Total				Commission Agent*	Wholesaler	Co-operatives	Total
Parabhavanahalli	21(52.50)	19(47.50)	40	7.8	9852.4	412171.4	0(0.00)	0(0.00)	21(100)	21
Vadaluru	36 (90.00)	4(10.00)	40	5.3	10305.6	269069.4	0(0.00)	0(0.00)	36(100)	36
Tumakuru	57 (71.2)	23(28.75)	80	6.3	10138.6	321791.2	0(0.00)	0(0.00)	57(100)	57
Malenahalli	8 (18.18)	36(81.82)	44	6.4	5875.0	98125.0	0(0.00)	2(25.0)	6 (75.0)	8
Nambihalli	14(38.89)	22(61.11)	36	2.8	10285.7	124321.4	1(7.14)	6(42.8)	7(50.0)	14
Hassan	22(27.50)	58(72.50)	80	3.7	8681.8	114795.5	1(4.55)	8(36.4)	13(59.1)	22
Alur	3(7.50)	37(92.50)	40	5.8	7500.0	115333.3	1(33.3)	1(33.3)	1(33.3)	3
Kunikere	5(12.50)	35(87.50)	40	2.9	8700.0	153500.0	2(40.0)	0(0.00)	3(60.0)	5
Chitradurga	8(10.0)	72(90.00)	80	3.5	8250.0	139187.5	3(37.5)	1(12.5)	4(50.0)	8
Total	87(36.25)	153(63.7)	240	5.6	9596.6	252656.3	4(4.60)	9(10.3)	74(85.1)	87

Note: * cum wholesaler. Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

4.4.4. Particulars of leaves

Very few (6) of the farmers sold their coconut leaves. An average one leaf cost is one rupee. The coconut leaves sold by bulk due to this reason average cost is very low. Total six farmers sold 22,524 leaves in study areas and earned average income ₹.5,260. Most of the farmers sold their leaves to local vendor (4), followed by commission agents cum wholesaler (2) (Table 4.8).

4.4.5. Particulars of trunk

In our study, total six farmers sold their coconut trunks. The coconut per trunk is an average cost of ₹.2,000. An average six households sold trunks and received net returns ₹.36,333 in study area. The trunk sold by only Hassan district farmers and particularly in Nambihalli village (5). The trunks sold to commission agents cum wholesaler (3), whole seller (2) and local vendor (1) and details are presented in Table 4.9.



Field visit Tumakuru District

Table 4.8. Particulars of leaves

Name of the Village/ District	Did you sell only leaves?			Leaves net returns			To whom sold		
	Yes	No	Total	Average per leave cost?	Total leaves amount	Average leaves amount	Commission agent*	Local vendor	Total
Parabhavanahalli	0(0.00)	40(100)	40	NA	NA	NA	NA	NA	NA
Vadaluru	1(2.50)	39(97.5)	40	1	1000	1000	0(0.00)	1(100)	1
Tumakuru	1(1.25)	79(98.75)	80	1	1000	1000	0(0.00)	1(100)	1
Malenahalli	1(2.27)	43(97.73)	44	1	20	20	0(0.00)	1(100)	1
Nambihalli	3(8.33)	33(91.67)	36	7.0	1504	3513	1(33.3)	2(66.7)	3
Hassan	4(5.00)	76(95.0)	80	6.9	1524	2640	1(25.0)	3(75.0)	4
Alur	1(2.50)	39(97.50)	40	1	20000	20000	1(100)	0(0.00)	1
Kunikere	0(0.00)	40(100)	40	NA	NA	NA	NA	NA	NA
Chitradurga	1(1.25)	79(98.75)	80	1	20000	20000	1(100)	0(0.00)	1
Total	6 (2.50)	234(97.50)	240	1	22524	5260	2(33.3)	4(66.7)	6

Note: * cum wholesaler; Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

Table 4.9. Particulars of trunk

Name of the Village/ District	Did you sell only trunk?			Trunk net returns			To whom sold			
	Yes	No	Total	Average per trunk cost?	Total trunk sold amount	Average trunk sold amount	Comm- ission *	Whole- saler	Local vendor	Total
Parabhavanahalli	0(0.00)	40(100)	40	NA	NA	NA	NA	NA	NA	NA
Vadaluru	0(0.00)	40(100)	40	NA	NA	NA	NA	NA	NA	NA
Tumakuru	0(0.00)	80(100)	80	NA	NA	NA	NA	NA	NA	NA
Malenahalli	1(2.27)	43(97.7)	44	1000	8000	8000.0	1.00	NA	NA	1.00
Nambihalli	5(13.89)	31(86.1)	36	2200	210000	42000.0	2.00	2.00	1.00	5.00
Hassan	6(7.50)	74(92.5)	80	2000	218000	36333.3	3.00	2.00	1.00	6.00
Alur	0(0.00)	40(100)	40	NA	NA	NA	NA	NA	NA	NA
Kunikere	0(0.00)	40(100)	40	NA	NA	NA	NA	NA	NA	NA
Chitradurga	0(0.00)	80(100)	80	NA	NA	NA	NA	NA	NA	NA
Total	6(2.50)	234(97.5)	240	2000	218000	36333.3	3.00	2.00	1.00	6.00

Note: * Agent cum wholesaler; Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

4.5. Coconut total income

Any economic activity income is very important. Without income, sustainability is very difficult to farmers for their day to day life. In our study area, farmers earned income through cultivation of coconut farming/crop. Out of 240 farmers, 227 farmers earned income during study period and remaining farmers did not earn income due to their coconut trees not in yielding stage. The average total income is very high in Tumakuru (₹.2,82,376) district, followed by Chitradurga (₹.1,01,456) and Hassan (₹.92,858). And the village wise highest average total income was by Parabhavanahalli (₹.2,94,419), followed by Vadaluru (₹.2,70,332) and Nambihalli (₹.1,24,892). There is a lot of average income difference among the farmers. The large farmers' average income is higher than the other farmers. And the large farmers' highest average income comes from Tumakuru (₹.8,31,540) district, followed by Hassan (₹.6,11,000) and Chitradurga (₹.1,79,187). And the village wise Vadaluru (₹.9,76,000) farmers' average income is higher, followed by Parabhavanahalli (₹.61,485). If observed Table 4.10 all coconut farmers earned income but large farmers earned more income as compared to marginal, small and medium farmers. According to Bhovi et al., (2017) examined every part of the coconut tree is economically useful for the farmers. The study finds that in selected districts (Tumakuru and Hassan) produced high grade milling copra and earned better prices, due to this returns it was more profitable. All categories farmers were benefited in the study area due to selling nuts as copra. In case of Chitradurga district farmers received less profit, may be due to selling the produce as either de-husked or tender coconut. This leads to fewer returns from their coconut gardens. The study observed that large farmers received more returns as compared to small and medium farmers in the study area.

Table 4.10. Particulars of average income

Name of the Village/ District	Marginal farmers	Small farmers	Medium farmers	Large farmers	Total
Parabhavanahalli	103250.0 (12)	245562.5(12)	439745.5(11)	614850.0(4)	294419.2(39)
Vadaluru	103957.0 (20)	155588.9(9)	301875.0(4)	976000.0(6)	270331.8(39)
Tumakuru	103691.9 (32)	207002.4(21)	402980.0(15)	831540.0(10)	282375.5(78)
Malenahalli	51521.8 (34)	101875.0(4)	320000.0(1)	210000.0(1)	67231.0(40)
Nambihalli	61811.4(21)	184055.6(9)	30000.0(1)	1012000.0(1)	124891.9(32)
Hassan	55450.5(55)	158769.2(13)	175000.0(2)	611000.0(2)	92858.1(72)
Alur	52458.3(12)	96328.6(14)	180000.0(7)	181000.0(6)	110874.4(39)
Kunikere	61076.9(13)	107075.0(20)	68333.3(3)	173750.0(2)	91789.5(38)
Chitradurga	56940.0(25)	102650.0(34)	146500.0(10)	179187.5(8)	101455.8(77)
Total	69566.3(112)	145605.1(68)	291100.0(27)	548545.0(20)	160895(227)

Source: Primary data, 2018. Note: figures in brackets represent total farmers

4.6. Cost of cultivation

Any economic production, cost is taking place. Without expenditure, production may not come. The cost of cultivation is varying from crop to crop and place to place in general and particularly in study areas. Here we brought components-wise expenditure. The main components are: seedling cost, irrigation cost (2 sub-cost), fertilizer & pesticides (3 sub-components), labour cost (3 sub-components), infrastructure/transportation and finally all cost together we estimated and presented here. During reference period, only 38 households reported that they spent expenditure on seedling purpose and they come in Hassan district and farmers are in Malenahalli (19) and Nambihalli (19). The seedling expenditure is higher in Nambihalli (₹.13,842) as compared to Malenahalli (₹.11,368) (Table 4.11).

Whoever failed in the tube well they used alternatively diesel motors for pumping water from canals to coconut gardens/farms. For using motor they used diesel. The diesel charge expenditure total average is ₹.10,445. But the district level diesel expenditure average amount was varying from Tumakuru (₹.12,489) district to Chitradurga (₹.10,000) and Hassan (₹.9,929). Village wise, Parabhavanahalli (₹.15,000) village spent more diesel charges, followed by Nambihalli (₹.14,688) and Alur (₹.12,400). Due to water scarcity in their tube well, 26 coconut farmers water purchased water from neighboring farmers in study period. Among the districts, Tumakuru district (24) farmers purchased water more in the study period. In Tumakuru district, total 24 farmers spent an average amount is ₹.34,375. In the case of Hassan district two farmers spent an average ₹.10,000 for water. Village wise, ten farmers in Vadaluru village spent an average ₹.52,200, followed by Parabhavanahalli (14) farmers spent an average ₹.21,643 and it is different from village to village (Table 4.11).

The fertilizer is used by coconut farmers to grow the coconut plant. Our study results reveal that total 161(67%) farmers used fertilizer in selected samples and spent an average ₹.30,145. Most of the Tumakuru district (76) farmers used more fertilizer and spent an average ₹.42,355 for their crop purpose, followed by Chitradurga (₹.21,858) and Hassan (₹.10,092). Village wise, Vadaluru farmers spent ₹.49,263, followed by Parabhavanahalli (₹35,447) and Alur (₹.23,988). In case of pesticides, only 60 farmers used and spent an average amount ₹.13,136. Pesticides are more used by Tumakuru district farmers and spent (₹.14,968) lot of amount, followed by Chitradurga (₹.12,083) and Hassan (₹.7,708). Village wise, Vadaluru village, 21 farmers spent ₹.25,900 on pesticides purpose, followed by Alur

(₹19,445). The manure is used by only six farmers and they spent an average amount of ₹.15,833. Tumakuru district average expenditure is higher than Chitradurga (₹.10,000). Hassan district farmers indicated that they did not use manure during study period.

Coconut is a labour intensive crop. Labour is very important to cultivate the coconut crop. Without labour production is very difficult. Our study data shows that 226 farmers used technical labour for harvesting their coconut and spent ₹.13,319 for technical labour charges and remaining farmers harvested their crop themselves. The technical labour charges are very higher in Tumakuru (₹.19,605) district, followed by Hassan (₹.10,317) and Chitradurga (₹.9,721). Village wise, Vadaluru (₹.24,762) village spent technical labour charges higher as compared to other villages. In similar way, the other labour charges (collections of coconut fall down on the ground) are higher in Tumakuru (₹.10,548) district, followed by Hassan (₹.6,813) and Chitradurga (₹.5,491). In addition to that 41 coconut farmers paid transportation cost (₹.7,560) and the average transportation cost is higher in Chitradurga (₹.21,167) district, followed by Tumakuru (₹.5,227) district (Table 4.11). Our study results reveal that 233 coconut farmers average expenditure was ₹.53,327. The average expenditure is higher in Tumakuru (₹91,214) district as compared to Chitradurga (₹.39,654) and Hassan (₹26,966). But village wise the coconut average expenditure is higher in Vadaluru (₹.1,10,353) village followed by Parabhavanahalli (₹.72,075) and Alur (₹.42,928).

The average income is higher in almost all districts and villages as compared to all average expenditure. During study area all farmers got profit from coconut crop. Some of the coconut farmers are able to get more profit due to their trees having crossed more than ten years. The average income and expenditure details are depicted in Figure 4.2. In general, every year, expenditure will increase gradually. According to our study results reveal that almost all components expenditure increased during study period. The farmers reported that seedling cost (38), diesel charges (93), water charges (26), fertilizer (166), pesticides (58), manure (6), technical labour (219), other labour (107) and transportation (33) charges increased over past five years (Table 4.12).

Table 4.11. Average cost of coconut cultivation

Name of the Village/ District	Seedling cost	Irrigation cost		Fertilizer & pesticides			Labour cost		Transportation	Average total cost
		Diesel charges	Water purchased from others	Fertilizer	Pesticides	Manure	Technical Labour	Other labour charges		
Parabhavanahalli	NA	(6) 15000.0	(14) 21642.9	(38) 35447.4	(10) 9761.9	NA	(39) 14448.7	(33) 6697.0	(20) 4125.0	(40) 72075.0
Vadaluru	NA	(12) 11233.3	(10) 52200.0	(38) 49263.2	(21) 25900.0	(5) 17000.0	(39) 24761.5	(33) 14398.5	(15) 6696.7	(40) 110353.5
Tumakuru	NA	(18) 12488.9	(24) 34375.0	(76) 42355.3	(31) 14967.7	(5) 17000.0	(78) 19605.1	(66) 10547.7	(35) 5227.1	(80) 91213.8
Malenahalli	(19) 11368.4	(26) 7000.0	(1) 10000.0	(10) 9150.0	(1) 3000.0	NA	(40) 8575.0	(9) 5777.8	NA	(43) 20872.1
Nambihalli	(19) 13842.1	(16) 14687.5	(1) 10000.0	(9) 11138.9	(5) 8650.0	NA	(31) 12564.5	(7) 8142.9	NA	(31) 35419.4
Hassan	(38) 12605.3	(42) 9928.6	(2) 10000.0	(19) 10092.1	(6) 7708.3	NA	(71) 10316.9	(16) 6812.5	NA	(74) 26966.2
Alur	NA	(15) 12400.0	NA	(32) 23987.5	(11) 19445.5	NA	(38) 10223.7	(16) 6825.0	(2) 4500.0	(39) 42928.2
Kunikere	NA	(19) 8105.3	NA	(34) 19852.9	(12) 5333.5	(1) 10000.0	(39) 9230.8	(18) 4305.6	(4) 29500.0	(40) 36463.5
Chitradurga	NA	(34) 10000.0	NA	(66) 21857.6	(23) 12082.6	(1) 10000.0	(77) 9720.8	(34) 5491.2	(6) 21166.7	(79) 39654.4
Total	(38) 12605.3	(94) 10444.7	(26) 32500.0	(161) 30145.	(60) 13135.8	(6) 15833.3	(226) 13319.5	(116) 8550.4	(41) 7559.8	(233) 53327.5

Note: Figures in brackets represents for total households.

Source: Primary data, 2018.

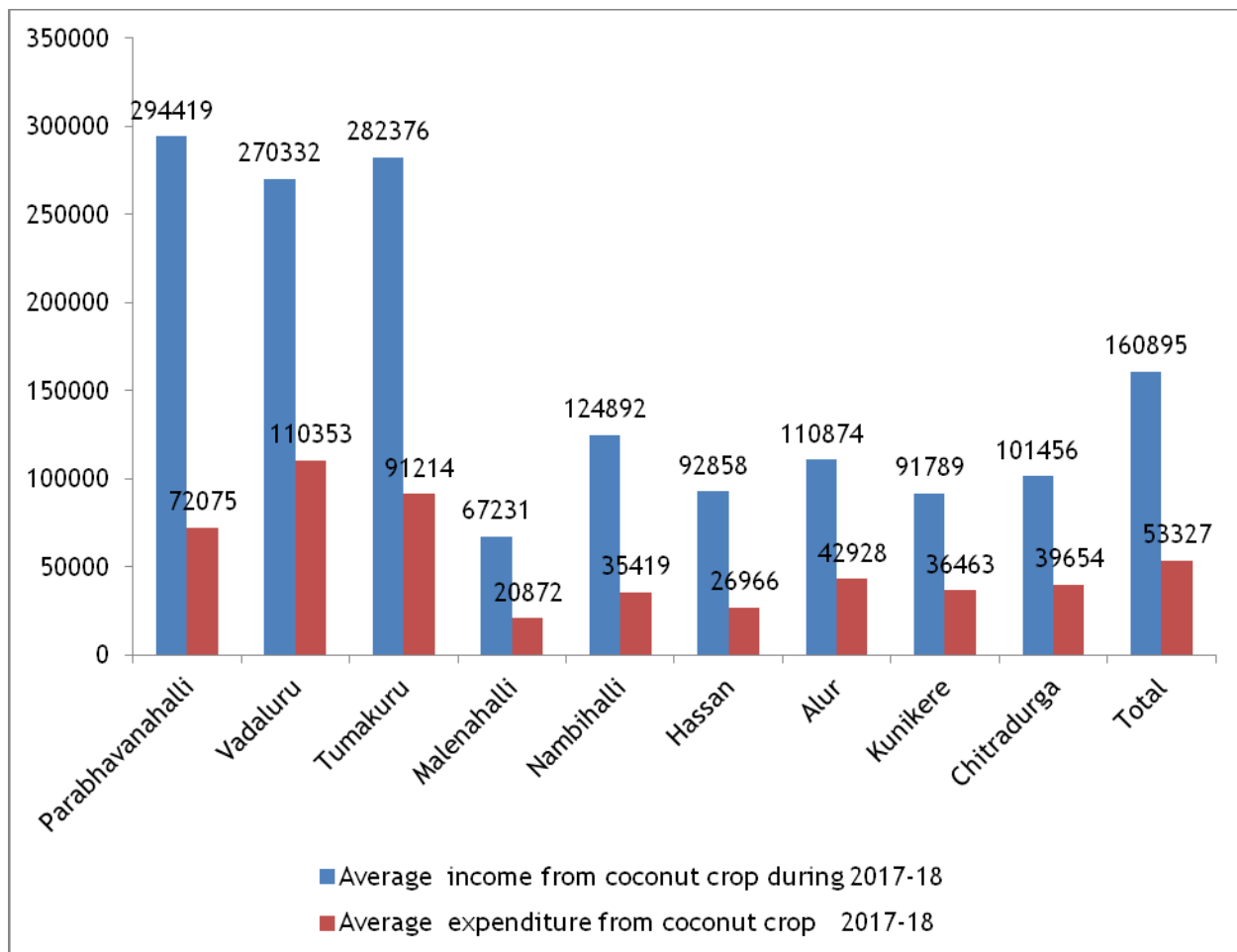


Figure 4.2. Average income earned from coconut crop during study period

Table 4.12. Do you think expenditure has increased over the past five years?

Name of the Village/ District	Seedling	Diesel charges	Water Charges	Fertilizer			Pesticides	Manure	Technical labour			Other labors			Transportation		
	Yes	Yes	Yes	Yes	No	Total	Yes	Yes	Yes	No	Total	Yes	No	Total	Yes	No	Total
Parabhavanahalli	NA	6	14	35	3	38	19	NA	35	4	39	27	6	33	13	7	20
Vadaluru	NA	12	10	38	NA	38	10	5	39	NA	39	33	NA	33	15	NA	15
Tumakuru	NA	18	24	73	3	76	29	5	74	4	78	60	6	66	28	7	35
Malenahalli	19	25	1	13	NA	13	1	NA	40	NA	40	9	NA	9	NA	NA	NA
Nambihalli	19	16	1	16	1	17	5	NA	31	NA	31	7	NA	7	NA	NA	NA
Hassan	38	41	2	29	1	30	6	NA	71	NA	71	16	NA	16	NA	NA	NA
Alur	NA	15	NA	30	2	32	11	NA	35	3	38	14	2	16	2	NA	2
Kunikere	NA	19	NA	34	NA	34	12	1	39	NA	39	17	1	18	3	1	4
Chitradurga	NA	34	NA	64	2	66	23	1	74	3	77	31	3	34	5	1	6
Total	38	93	26	166	6	172	58	6	219	7	226	107	9	116	33	8	41

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.



Field visit Tumakuru District

PROBLEMS OF COCONUT FARMERS

Rural people face many problems in general and particularly by coconut farmers. The main intensive of the primary survey is to dig out the real causes probably that led to coconut production decline. In our study, farmers faced many problems and brought into component wise and presented here and those are: seedling problem, weather problem, water problem, disease problem, lack of post harvest management facilities, marketing problem, infrastructure/transportation problem and lack of sufficient extension services.

5.1. Seedling problem

Rajkumar and Krishnakumar (2016) explained about the practices of coconut cultivation and its importance. Coconut is a perennial crop, due to that there is no compromise of quality of seedlings. According to study irrigation facilities are very important for the growth of coconut palms. In the same manner, nearly 250 liters of water is required for a week per palm in summer. In rainy season drainage system should be maintained. During cultivation of coconut crop farmers faced (19%) lot of problems in study area. Our study results reveal that in Chitradurga district (34%) farmers faced more problems, followed by Tumakuru (18%) and Hassan (6%). In village wise, Alur (35%) farmers faced more problems than other villagers; second place goes to Kunikere (33%) and Vadaluru (33%) and details are presented in Table 5.1. The coconut farmer's faced different problems in study period. Firstly, very few (3%) of the farmers faced lack of quality of seedling during cultivation of their coconut crops in study period. The seedling problem is higher in Chitradurga (5%) district, followed by Tumakuru (4%) and Hassan (1%). Shareefa et al., (2016) provided the information on young management of coconut palms. He stressed on the importance of quality of planting materials to cultivate the coconut crops. Usually coconut gestation period is nearly four to six years and its yield is up to 60 years. The quality of seedling is very important for coconut. The sunlight should reach to all coconuts in the coconut garden. Ensure the adequate water supply through rainfall or irrigation facilities be provided in suitable manner. From the initial level regular manure should be provided for the plants. Accordingly, every year manure shall gradually increase as plant is growing.

But majority (97%) of the coconut farmers did not face seedling problems due to their coconut trees planted many years ago. Secondly, few (5%) of the farmers expressed that they want better varieties and more yield seeds. The better varieties seeds expected more in Chitradurga (9%) district, followed by Tumakuru (4%) and Hassan (3%) and remaining coconut farmers did not suggest due to whatever varieties they were having and they were satisfied. And thirdly, some (9%) of the farmers informed their coconut crops faced ageing palms and they suggested that they need to be replanted immediately. To replanting the coconut trees, farmers required financial support from government side. The ageing problem is higher in Chitradurga (13%) district, followed by Hassan (9%) and Tumakuru (6%). In village wise, Alur (15%) farmers informed more, followed by Kunikere and Nambihalli (Table 5.1).

Table 5.1. Particulars of seedling problems

Name of the Village/ District	coconut farmers faced problems			Seedling problems (lack of quality)			Better varieties			Ageing palms that need to be replanted		
	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total
Parabhavanahalli	1 (2.50)	39(97.50)	40	1(2.50)	39(97.50)	40	1(2.50)	39(97.5)	40	2(5.00)	38(95.00)	40
Vadaluru	13(32.50)	27(67.50)	40	2(5.00)	38(95.00)	40	2(5.00)	38(95.0)	40	3(7.50)	37(92.50)	40
Tumakuru	14(17.5)	66(82.50)	80	3(3.75)	77(96.2)	80	3(3.75)	77(96.2)	80	5(6.25)	75(93.7)	80
Malenahalli	0 (0.00)	44(100)	44	1(2.27)	43(97.73)	44	0(0.00)	44(100)	44	3(6.82)	41(93.18)	44
Nambihalli	5 (13.89)	31(86.11)	36	0(0.00)	36(100)	36	2(5.56)	34(94.4)	36	4(11.11)	32(88.89)	36
Hassan	5 (6.25)	75(93.75)	80	1(1.25)	79(98.7)	80	2(2.50)	78(97.5)	80	7(8.75)	73(91.2)	80
Alur	14(35.00)	26(65.00)	40	3(7.50)	37(92.50)	40	5(12.5)	35(87.5)	40	6(15.00)	34(85.00)	40
Kunikere	13(32.50)	27(67.50)	40	1(2.50)	39(97.50)	40	2(5.00)	38(95.0)	40	4(10.0)	36(90.00)	40
Chitradurga	27(33.7)	53(66.25)	80	4(5.00)	76(95.0)	80	7(8.75)	73(91.2)	80	10(12.5)	70(87.5)	80
Total	46 (19.2)	194(80.8)	240	8(3.33)	232(96.7)	240	12(5.0)	228(95.0)	240	22(9.17)	218(90.8)	240

Source: Primary data, 2018.

Note: Figures in brackets are percentage to row total.

5.2. Weather problem

A good number (40%) of farmers reported that they faced weather problem in study area. The coconut production depends on weather condition. If weather is good, coconut trees give good yield and diseases are under control in normal condition. If weather is changing coconut trees affect to diseases. In addition to that if winds are more, there is a fall down of coconut trees. In our study, nearly 40 per cent of the farmers informed that they faced weather problem and this information is higher in Tumakuru (74%) district, followed by Chitradurga (30%) and Hassan (18%). Village wise, majority of the Parabhavanahalli (93%) village farmers informed that they faced weather problem, followed by Vadaluru (55%) and Alur (33%). Vanamadevi (2016) conducted study in Tiruppur district, Thali panchayat. The study conducted 150 respondents in convenience sampling technique and finds that climatic condition was the main problem faced by the cultivators of coconut. In our study some (25%) of the farmers faced natural calamities and this information is reported higher in Tumakuru (51%) district, followed by Chitradurga (23%) and Hassan (1%). Village wise natural calamities problem faced was more in Parabhavanahalli (60%), followed by Vadaluru (43%) and Alur (35%). In the same manner, very few (5) farmers informed that thunder storm happens in during study period in their coconut farm. Due to this coconut crop affected in study areas and details are depicted in Table 5.2.

Table 5.2. Particulars of weather problem

Name of the Village/ District	Weather problem			A. Natural calamities			b. Thunder-storm
	Yes	No	Total	Yes	No	Total	Yes
Parabhavanahalli	37(92.50)	3(7.50)	40	24(60.0)	16(40.0)	40	NA
Vadaluru	22(55.00)	18(45.00)	40	17(42.5)	23(57.5)	40	NA
Tumakuru	59(73.75)	21(26.25)	80	41(51.2)	39(48.7)	80	NA
Malenahalli	5 (11.36)	39(88.64)	44	0(0.00)	44(100)	44	1
Nambihalli	9(25.00)	27(75.00)	36	1(2.78)	35(97.2)	36	2
Hassan	14(17.50)	66(82.50)	80	1(1.25)	79(98.7)	80	3
Alur	13(32.50)	27(67.50)	40	14(35.0)	26(65.0)	40	1
Kunikere	11(27.50)	29(72.50)	40	4(10.0)	36(90.0)	40	1
Chitradurga	24(30.00)	56(70.00)	80	18(22.5)	62(77.5)	80	2
Total	97(40.42)	143(59.58)	240	60(25.0)	180(75.0)	240	5

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

5.3. Water problem

Without water, cultivation of coconut crop is very difficult. According to our study nearly 52 per cent of the coconut farmers faced water problem during study period. This problem is faced more in Tumakuru (99%) district, followed by Chitradurga (48%) and Hassan (9%). In the same way, village wise, Parabhavanahalli all (100%) coconut farmers faced water problem, followed by Vadaluru (98%) and Alur (48%) and Kunikere (48%); and farmers suffered lack of sufficient water during study period. Nearly 60 per cent of coconut farmers reported that droughts affected during study period and this information is reported 98 per cent in Tumakuru district, followed by Chitradurga (66%) and Hassan (16%) and village wise, Parabhavanahalli (100%) coconut farmers reported that there was a serious drought which affected their village, followed by Vadaluru (95%) and Kunikere (70%). In similar way, very few (8%) of the farmers reported that, typhoon affected during study period. And this was higher in Tumakuru (14%) district, followed by Chitradurga, and details are presented in Table 5.3.

Table 5.3. Particulars of water problem

Name of the Village/District	Water problem			A. Drought			B. Typhoon		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Parabhavanahalli	40(100)	0(0.00)	40	40(100)	0(0.00)	40	3(7.50)	37(92.5)	40
Vadaluru	39(97.5)	1(2.50)	40	38(95.0)	2(5.00)	40	8(20.00)	32(80.0)	40
Tumakuru	79(98.7)	1(1.25)	80	78(97.5)	2(2.50)	80	11(13.7)	69(86.2)	80
Malenahalli	5(11.36)	39(88.6)	44	7(15.91)	37(84.1)	44	0(0.00)	44(100)	44
Nambihalli	2(5.56)	34(94.4)	36	6(16.67)	30(83.3)	36	0(0.00)	36(100)	36
Hassan	7(8.75)	73(91.2)	80	13(16.2)	67(83.7)	80	0(0.00)	80(100)	80
Alur	19(47.5)	21(52.5)	40	25(62.5)	15(37.5)	40	4(10.0)	36(90.0)	40
Kunikere	19(47.5)	21(52.5)	40	28(70.0)	12(30.0)	40	5(12.50)	35(87.5)	40
Chitradurga	38(47.5)	42(52.5)	80	53(66.2)	27(33.7)	80	9(11.2)	71(88.7)	80
Total	124(51.7)	116(48.3)	240	144(60.0)	96(40.0)	240	20(8.3)	220(91.7)	240

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

5.4. Disease problem

Perera et al., (2015) highlighted Weligama Coconut Leaf Wilt Disease (WCLWD) in Southern Sri Lanka. Perennial tree crops such as coconuts faced the consequences of incurable diseases. In our study results shows that the coconut farmers faced many diseases problems and affected main diseases are: Pests and disease (68%), tatipaka (3%), thanjaw wilt (36%), bud rot (9%),

lethal yellowing (48%) and nusi roga (24%). Here, we discussed each disease wise and presented below. The pests attacked coconut trees, due to this reason the coconut trees sometimes get drying in their lives. And sometimes there is a possibility to die coconut trees. The pests and disease affected were very higher in Tumakuru (98%) district, followed by Hassan (56%) and Chitradurga (50%). Village wise, Parabhavanahalli (98%) and Vadaluru (98) village's farmers mostly suffered from pests & disease, followed by Malenahalli (61%) and Kunikere (55%). If tatipaka disease attacked to coconut trees, it affected the tender coconut/dry coconut and was not useful for human consumption. Very few (3%) of the Tumakuru district farmers suffered from tatipaka disease. In similar way, the thanjaw wilt disease affected 68 per cent in Tumakuru district, followed by Chitradurga (30%) and Hassan (11%). Village wise Parabhavanahalli (73%) village farmers reported more, followed by Vadaluru (63%) and Alur (30%) and Kunikere (30) villages (Table 5.4a). Bud rot disease creates a lot of problems for coconut farmers. Once bud rot disease attacked to coconut trees, immediately the coconut trees growth will stop and leaves and bud will damage and bud will dry up and coconut tree will totally dry up. In our study areas nine per cent of the coconut farmers suffered from this disease. Most of the Tumakuru (23%) district farmers suffered from the bud rots disease, followed by Hassan (3%) and Chitradurga (3%). Among the villages, Vadaluru (30%) village farmers suffered from this disease (Table 5.4b). Lethal yellowing disease attacks to coconut trees, immediately coconut trees leaves get yellow color and almost all leaves will fall down and only trunk will be available. In our study nearly 48 per cent of the farmers coconut trees suffered from leathal yellowing disease. And this disease is higher in Tumakuru (70%) district, followed by Hassan (40%) and Chitradurga (35%) and village wise Parabhavanahalli (85%) village coconut farmers reported more. If coconut trees are affected Nusi roga (Kannada name) disease, it causes low yield. The symptom of Nusi roga is tender coconut/dry coconut will be in black shape. Our study results reveal that 36 per cent of the Chitrdurga district farmers reported that their trees attacked to this disease, followed by Tumakuru (34%) and Hassan (3%). In village wise, most of the Vadaluru (47%) farmers suffered from this disease, followed by Alur (38%) and Kunikere (35%) (Table 5.4b). Kishore and Murthy (2016) observed growth in area production and productivity of coconut in Karnataka and provided suitable information in their paper. The study finds that, the decrease in production and productivity is because of droughts and pest and diseases incidences happen after 2011-12.

Table 5.4a. Disease problem

Name of the Village/District	a. Pests and diseases			b. Tatipaka			c. Thanjaw wilt		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Parabhavanahalli	39(97.50)	1(2.50)	40	1(2.50)	39(97.50)	40	29(72.50)	11(27.50)	40
Vadaluru	39(97.50)	1(2.50)	40	6(15.0)	34(85.00)	40	25(62.50)	15(37.50)	40
Tumakuru	78(97.50)	2(2.50)	80	7(8.75)	73(91.2)	80	54(67.50)	26(32.50)	80
Malenahalli	27(61.36)	17(38.64)	44	1(2.27)	43(97.73)	44	5(11.36)	39(88.64)	44
Nambihalli	18(50.00)	18(50.00)	36	0(0.00)	36(100)	36	4(11.11)	32(88.89)	36
Hassan	45(56.25)	35(43.75)	80	1(1.25)	79(98.7)	80	9(11.25)	71(88.75)	80
Alur	18(45.00)	22(55.00)	40	0(0.00)	40(100)	40	12(30.00)	28(70.00)	40
Kunikere	22(55.00)	18(45.00)	40	0(0.00)	40(100)	40	12(30.00)	28(70.00)	40
Chitradurga	40(50.00)	40(50.00)	80	0(0.00)	80(100)	80	24(30.00)	56(70.00)	80
Total	163(67.9)	77(32.1)	240	8(3.33)	232(97)	240	87(36.25)	153(63.7)	240

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

Table 5.4b.Disease problem

Name of the Village/District	d. Bud rot			e. Lethal yellowing			f. Nusi roga		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Parabhavanahalli	6(15.0)	34(85.0)	40	34 (85.0)	6(15.00)	40	8(20.0)	32(80.00)	40
Vadaluru	12(30.0)	28(70.0)	40	22(55.0)	18(45.00)	40	19 (47.0)	21 (52.50)	40
Tumakuru	18(22.5)	62(77.5)	80	56(70.0)	24 (30.0)	80	27 (33.75)	53 (66.25)	80
Malenahalli	0(0.00)	44(100)	44	23(52.27)	21(47.73)	44	1(2.27)	43 (97.73)	44
Nambihalli	2(5.56)	34(94.4)	36	9(25.00)	27(75.00)	36	1(2.78)	35 (97.22)	36
Hassan	2(2.50)	78(97.5)	80	32(40.0)	48(60.0)	80	1(2.50)	43 (97.50)	44
Alur	0(0.0)	40(100)	40	14(35.00)	26(65.00)	40	15(37.50)	25 (62.50)	40
Kunikere	2(5.0)	38(95.0)	40	14(35.00)	26(65.00)	40	14(35.00)	26(65.00)	40
Chitradurga	2(2.50)	78(97.5)	80	28(35.00)	52(65.0)	80	29(36.25)	51 (63.75)	80
Total	22(9.2)	218(90.8)	240	116(48.3)	124(51.7)	240	58(24.17)	182 (75.83)	240

Source: Primary data, 2018.

Note: Figures in brackets are percentage to row total.

5.5. Post harvest management (PHM)

The PHM facilities are very important to coconut farmers to keep their dry coconut/copra to get good price in the market. Majority (68%) of the coconut farmers were not having shed facilities. Because of this reason, farmers had to sell their coconut production immediately. Due to this reason some of the coconut farmers were getting low prices/income. Majority of the Tumakuru (98%) district farmers were not having PHM facilities, followed by Chitradurga (73%) and Hassan (34%). Village wise, Parabhavanahalli villages 100 per cent coconut farmers were not having shed facilities in their houses followed by Vadaluru (95%) and Kunikere (75%) (Table 5.5). In the same way the storage facilities were not having 100 per cent in Tumakuru district, followed by Chitradurga (98%) and Hassan (93%). Village wise, Parabhavanahalli (100%) and Vadaluru (100%), Malenahalli(100%) villages coconut farmers 100 per cent were not having storage facilities, followed by Alur(98%) and Kunikere (98%), and it indicates that farmers need to construct storage facilities in their houses. And the Government of Karnataka/India provides some subsidized storage facilities for coconut farmers.

Table 5.5. Lack of post harvest management

Name of the Village/District	a. Shed *			b. Storage **		
	Yes	No	Total	Yes	No	Total
Parabhavanahalli	0(0.00)	40(100)	40	0(0.00)	40(100)	40
Vadaluru	2(5.00)	38(95.00)	40	0(0.00)	40(100)	40
Tumakuru	2(2.50)	78(97.50)	80	0(0.00)	80(100)	80
Malenahalli	24(54.55)	20(45.45)	44	0(0.00)	44(100)	44
Nambihalli	29(80.56)	7(19.44)	36	6(16.6)	30(83.3)	36
Hassan	53(66.25)	27(33.75)	80	6(7.50)	74(92.5)	80
Alur	12(30.00)	28(70.00)	40	1(2.50)	39(97.5)	40
Kunikere	10(25.00)	30(75.00)	40	1(2.50)	39(97.5)	40
Chitradurga	22(27.50)	58(72.50)	80	2(2.50)	78(97.5)	80
Total	77(32.08)	163(67.92)	240	8(3.33)	232(96.67)	240

Note: *to keep coconuts to copra, **to keep coconut to dry

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

5.6. Marketing problem

Market is very important to farmers to sell their product. Nagendra and Pralhad examined the coconut production and marketing in Tumakuru district in Karnataka State. The study used secondary (from 2000-01 to 2010-2011) data. According to author, intermediaries played a

major role for selling of coconut product in Tumakuru district. According to our primary data results reveals that 27 per cent of the farmers informed that there was a middlemen problem in their places. A farmer can sell their product directly in the market where he/she will get good remuneration. But, Chitradurga (48%) farmers informed that there was a middlemen problem in their location, followed by Tumakuru (29%) and Hassan (4%). Village wise, Kunikere (53%) village farmers were informed more. Vanamadevi (2016) study finds that majority (122) of the respondents marketed through intermediaries only. In our study results shows that very few (16%) of the farmers were informed that Broker problem in their places. The Broker buys farmer's products and sells in the market, due to this reason farmers were getting low prices. The broker problem is higher in Chitradurga (31%) district, followed by Tumakuru (16%) and Hassan (1%) in village wise Kunikere village (38%) farmers faced broker problem more, followed by Vadaluru (25%) and Alur (25%) and details are presented in the Table 5.6. In the opposite direction 84 per cent of the farmers had not faced broker problem.

Table 5.6. Particulars of marketing problem

Name of the Village/District	a. Middlemen			b. Broker		
	Yes	No	Total	Yes	No	Total
Parabhavanahalli	20(50.00)	20(50.00)	40	3(7.50)	37(92.50)	40
Vadaluru	3(7.50)	37(92.50)	40	10(25.00)	30(75.00)	40
Tumakuru	23(28.75)	57(71.25)	80	13(16.25)	67(83.75)	80
Malenahalli	0(0.00)	44(100)	44	0(0.00)	44(100)	44
Nambihalli	3(8.33)	33(91.67)	36	1(2.78)	35(97.22)	36
Hassan	3(3.75)	77(96.25)	80	1(1.25)	79(98.75)	80
Alur	17(42.50)	23(57.50)	40	10(25.00)	30(75.00)	40
Kunikere	21(52.50)	19(47.50)	40	15(37.50)	25(62.50)	40
Chitradurga	38(47.50)	42(52.50)	80	25(31.25)	55(68.75)	80
Total	64(26.67)	176(73.33)	240	39(16.25)	201(83.75)	240

Source: Primary data, 2018.

Note: Figures in brackets are percentage to row total.

5.7. Infrastructure problem

Infrastructure is very important for the rural people from going one place to another place. Our study results reveal that 15 per cent of the coconut farmers informed that there was a transportation problem in their place. Due to this reason, some of the farmers in timely not transported their product in market. And this situation is higher in Chitradurga (23%) district, followed by Tumakuru (18%) and Hassan (5%). In village wise, Alur (23%) and Kunikere (23%)

village people suffered more transportation problem, followed by Parabhavanahalli (18%) and Vadaluru (18%). Every farmer is expected to get minimum prices for their products. The minimum price covers their expenditure. Some (43%) of the farmers reported that they got low price from their products during study period. This is economic burden for farmers. Most of the Tumakuru (58%) farmers received low prices for their products, followed by Chitradurga (53%) and Hassan (20%). Village wise Parabhavanahalli (68%) village farmers got low prices, followed by Alur (53%) and Kunikere (53%) (Table 5.7).

Table 5.7. Particulars of infrastructure problem and low prices

Name of the Village /District	Infrastructure problem (transportation)			Are you getting Minimum Supporting Price (MSP)? Low prices		
	Yes	No	Total	Yes	No	Total
Parabhavanahalli	7(17.50)	33(82.50)	40	27(67.50)	13(32.50)	40
Vadaluru	7(17.50)	33(82.50)	40	19(47.50)	21(52.50)	40
Tumakuru	14(17.50)	66(82.50)	80	46(57.50)	34(42.50)	80
Malenahalli	1(2.27)	43(97.73)	44	5(11.36)	39(88.64)	44
Nambihalli	3(8.33)	33(91.67)	36	11(30.56)	25(69.44)	36
Hassan	4(5.00)	76(95.00)	80	16(20.00)	64(80.00)	80
Alur	9(22.50)	31(77.50)	40	21(52.50)	19(47.50)	40
Kunikere	9(22.50)	31(77.50)	40	21(52.50)	19(47.50)	40
Chitradurga	18(22.50)	62(77.50)	80	42(52.50)	38(47.50)	80
Total	36(15.00)	204 (85.0)	240	104(43.33)	136(56.67)	240

Source: Primary data, 2018.

Note: Figures in brackets are percentage to row total.

5.8. Particulars of production

Majority (74%) of the coconut farmers informed that due to disease problem, yield got declined. In the last one decade farmers did not receive sufficient rainfall and due to deficit rainfall farmers suffered from the drought. Due to lack of sufficient water, yields declined in study areas and this is very high in Chitradurga (94%) district, followed by Tumakuru (91%) and Hassan (38%). Village wise, Vadaluru (98%) coconut farmers informed more, followed by Kunikere (95%) and Alur (93%). In similar way, due to above mentioned reasons, farm productivity also declined and this is reported higher in Chitradurga (91%) district, followed by Tumakuru (88%) and Hassan (36%) (Table 5.8).

Table 5.8. Particulars of production

Name of the Village/District	a. Declining yields			b. Decreasing farm productivity		
	Yes	No	Total	Yes	No	Total
Parabhavanahalli	34(85.00)	6(15.00)	40	31(77.50)	9(22.50)	40
Vadaluru	39(97.50)	1(2.50)	40	39(97.50)	1(2.50)	40
Tumakuru	73(91.25)	7(8.75)	80	70(87.50)	10(12.50)	80
Malenahalli	12(27.27)	32(72.73)	44	11(25.00)	33(75.00)	44
Nambihalli	18(50.00)	18(50.00)	36	18(50.00)	18(50.00)	36
Hassan	30(37.50)	50(62.50)	80	29(36.25)	51(63.75)	80
Alur	37(92.50)	3(7.50)	40	37(92.50)	3(7.50)	40
Kunikere	38(95.00)	2(5.00)	40	36(90.00)	4(10.00)	40
Chitradurga	75(93.75)	5(6.25)	80	73(91.25)	7(8.75)	80
Total	178(74.17)	62(25.83)	240	172(71.67)	68(28.33)	240

Source: Primary data, 2018.

Note: Figures in brackets are percentage to row total.

5.9. Extension services

Farmers are expected to receive extension services from horticulture department. If farmers get extension services in time, they get more production and increase the productivity and this leads to increase in the farmers' income. Our study results reveal that 64 per cent of the coconut farmers reported that they did not get extension services and this information is higher in Hassan (85%) district, followed by Chitradurga (78%) and Tumakuru (29%). Village wise, Malenahalli (89%) farmers reported higher, followed by Alur (83%) and Nambihalli (81%). Some of the coconut farmers received services in their respective place monthly once (5.2%), monthly twice (3.4%), every two months once (3%), every three months once (28%) and every six months once (60%). The main reasons for not visiting extension officers in farmers houses are: No officer visited (54%), farmers not approaching (32%), not aware of officers information (14%) (Table 5.9).

Table 5.9. Particulars of extension services

Name of the Village/District	Did extension services provide Horticulture department			How often they providing						Reasons for extension officer not visiting field			
	Yes	No	Total	Monthly once	Monthly twice	Two months once	Three months once	Every six months once	Total	No one visited	Not Approaching	Not aware of officers information	Total
Parabhavana halli	26 (65.00)	14 (35.00)	40	0 (0.00)	0 (0.0)	0 (0.0)	11 (47.8)	12 (52.2)	23	0 (0.0)	2 (100)	0 (0.00)	2
Vadaluru	31 (77.50)	9 (22.50)	40	0 (0.00)	0 (0.0)	1 (8.3)	4 (33.33)	7 (58.33)	12	NA	NA	NA	NA
Tumakuru	57 (71.25)	23 (28.7)	80	0 (0.00)	0 (0.0)	1 (2.8)	15 (42.8)	19 (54.3)	35	0 (0.0)	2 (100)	0 (0.00)	2
Malenahalli	5 (11.36)	39 (88.64)	44	1 (50.0)	0 (0.0)	0 (0.0)	1 (50.0)	0 (0.00)	2	NA	NA	NA	NA
Nambihalli	7 (19.44)	29 (80.56)	36	1 (25.0)	2 (50.0)	1 (25.0)	0 (0.00)	0 (0.00)	4	NA	NA	NA	NA
Hassan	12 (15.00)	68 (85.0)	80	2 (33.3)	2 (33.3)	1 (16.6)	1 (16.7)	0 (0.00)	6	NA	NA	NA	NA
Alur	7 (17.50)	33 (82.50)	40	0 (0.00)	0 (0.0)	0 (0.0)	0 (0.00)	7 (100)	7	9 (64.3)	4 (28.5)	1 (7.14)	14
Kunikere	11 (27.50)	29 (72.50)	40	1 (10.0)	0 (0.0)	0 (0.0)	0 (0.00)	9 (90.0)	10	6 (90.0)	3 (25.0)	3 (25.0)	12
Chitradurga	18 (22.50)	62 (77.5)	80	1 (5.8)	0 (0.0)	0 (0.0)	0 (0.00)	16 (94.1)	17	15 (57.7)	7 (26.9)	4 (15.4)	26
Total	87 (36.25)	153 (63.7)	240	3 (5.2)	2 (3.4)	2 (3.4)	16 (27.6)	35 (60.3)	58	15 (53.5)	9 (32.1)	4 (14.29)	28

Source: Primary data, 2018. Note: Figures in brackets are percentage to row total.

Chapter VI

FINDINGS AND POLICY SUGGESTIONS

The major findings and policy suggestions are presented below in the following headings

6.1. Findings

- The Karnataka state coconut crop area share was increased from 18 per cent in 2000-01 to 25 per cent in 2015-16.
- The Tumakuru district share of production in Karnataka is higher among the 30 districts in Karnataka and followed by Hassan and Chitradurga. But the Tumakuru district, share of production in Karnataka state gradually declined from 37.64 per cent in 2000-01 and 32.66 per cent in 2014-15.
- Among the sample villages, OBC are higher in Nambihalli (88.89%) village, followed by Parabhavanahalli (78%). Among the social groups SCs are very less in cultivation of coconut crop.
- Few (12%) of the coconut farmers insured their crop during study period. The bankers (26) suggested to farmers to insure their coconut crops for future crop loss purposes.
- The main reasons for not insuring coconut crops are: Farmers are not interested, followed by lack of awareness, don't know policy information and no trust on insurance companies.
- Land is very important production asset for rural people. The average owned land is higher in Chitradurga district (7.65 acres). In similar way, the average owned land is higher in Alur village (9.26 acres).
- The main irrigation source of the farmers were tube well (75%), followed by canal (4%), open well (3%), tanks (1%), others (1%). Some of the farmers used two irrigation sources.
- Half of the farmers land soil quality is good (51%), followed by average (48%) and poor (1%).

- The agricultural income contributed in significant manner among the activities. Among the activities the highest average income comes from agricultural sector in Vadaluru village (₹.4,45,975) and the lowest income from Malenahalli village (₹.89,227). The share of agriculture income is higher in Chitradurga (92%) district. The highest second income comes from service sector (7%), followed by dairy & animal husbandry (3%), other sources (1%) and self business (0.46%).
- The institutional average borrowed loan amount is higher in Chitradurga (₹.1,31,750) district. At the same time, the institutional borrowed amount is higher in Alur (₹.1,96,250) village. The average outstanding amount is higher in Chitradurga (₹.1,28,625) district. In similar way, among the villages, the outstanding average amount is higher in Allur (₹.1,95,000) and the lowest outstanding amount comes from Parabhavanahalli (₹.34,375). At the time of our study only six farmers repaid full loan amount and remaining coconut farmers due is still pending.
- Very few of the coconut farmers borrowed money from land lords (10), Money lenders (10) and others (23) and these are all from non-institutional sources. For agriculture purpose all farmers took loan.
- In study area, the total cultivated land is 964 acres and 38,908 coconut trees were grown at the time of our study in all selected villages. The coconut average land is higher in Tumakuru (4.78 acres) district, followed by Chitradurga (4.82 acres) and Hassan (2.45 acres). Village wise, the average coconut land is higher in Alur (5.74 acres) village, followed by Parabhavanahalli (4.88 acres), and Vadaluru (4.69 acres).
- Nearly 95 per cent of the farmers received production during study period, whereas five per cent of the farmers were not getting production due to coconut trees not reaching yield stage.
- The copra net returns (income) are higher in Tumakuru district (₹.32,1791) and village wise, the highest net returns received is by Parabhavanahalli (₹.4,12,171) village.
- There are a lot of average income differences among the farmers. The large farmers' average income is higher than the other farmers. And the large farmers' highest average income comes from Tumakuru (₹.8,31,540) district. Village wise Vadaluru (₹.9,76,000)

farmers' average income is higher. All coconut farmers earned income but large farmers earned more profit as compared to marginal, small and medium farmers.

- Coconut farmers reported that seedling cost (38), diesel charges (93), water charges (26), fertilizer (166), pesticides (58), manure (6), technical labour (219), other labour (107) and transportation (33) charges increased over past five years.
- Firstly, very few (3%) of the farmers faced lack of quality of seedling during cultivation of their coconut crops in study period. Secondly, few (5%) of the farmers expressed that they want better varieties and more yield seeds.
- Nearly 40 per cent of the farmers informed that they faced weather problem and 52 per cent of the coconut farmers faced water problem during study period. In our study results shows that the coconut farmers faced many diseases, problems and affected main diseases are: Pests and disease (68%), tatipaka (3%), thanjaw wilt (36%), bud rot (9%), lethal yellowing (48%) and nusi roga (24%).
- Majority (68%) of the coconut farmers were not having shed facilities. Because of this reason, farmers had to sell their coconut production immediately. Due to this reason some of the coconut farmers were getting low prices/income.
- Nearly 27 per cent of the farmers informed that there was a middlemen problem in their places. Infrastructure is very important for the rural people for going from one place to another place. Our study results reveal that 15 per cent of the coconut farmers informed that there was a transportation problem in their place.
- Due to lack of sufficient water, yields declined in study areas. Nearly 64 per cent of the coconut farmers reported that they did not get extension services.

6.2. Policy suggestions

- To cultivation of coconut crop land played a key role, in addition to that, financial background is required. Due to lack of financial support, SCs were unable to cultivate coconut crop more in selected villages. To inclusive (SCs farmers') growth, Government of Karnataka has to provide some intensive facilities to them. Therefore, social imbalances will reduce in selected villages.
- Majority (68%) of the coconut farmers were not having shed facilities. Because of this reason farmers had to sell their coconut production immediately. Due to this reason, some of the coconut farmers were getting low prices/income. To avoid the loss, government has to provide some subsidies to construct the shed for coconut farmers.
- Nearly 27 per cent of the farmers informed that there was a middlemen problem and broker problem in their places. To avoid middlemen/broker, if possible, government has to provide alternative facilities to the coconut farmers.
- Marginal and small farmers earned less profit as compared to large farmers. To inclusive growth of marginal and small farmers', government has to provide some technical/financial/extension/facilities to the marginal and small coconut farmers.
- Some of the farmers are facing disease problems; to avoid the diseases, our study suggested that to control the disease holistic pest management techniques should be approached. And also our study suggested that the capacity building programmes should be conducted for coconut farmers; therefore, farmers are able to know updated skills.

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