A comprehensive review of literature is of paramount to any research endeavour, as it not only gives an idea on the work done in the past and assists in delineation of problem area but also helps to conceptualize the related factors to be taken for the study. Hence, an attempt was made to use the available literature pertinent to the study. The closely related literature, which had sound meaningful relation to this study, is presented under the following headings:

2.1 Characteristics of medicinal plant growers.

2.2 Knowledge level of medicinal plant growers.

2.3 Extent of adoption of recommended medicinal plant technologies.

2.4 Marketing behaviour of medicinal plant growers.

2.5 Relationship between the characteristics of the medicinal plant growers with their extent of adoption.

2.6 Constraints faced by medicinal plant growers in the adoption of medicinal plants technologies.
2.1. Characteristics of medicinal plant growers

2.1.1. Age

Manju (2004) reported that the age group between 40 and 49 were showing much interest in cultivating ashwagandha and coleus which were accounted for 47.62 and 44.55 per cent followed by the age group of 50-59 (23.81 per cent and 22.22 per cent) and the least (1.00 per cent and 7.41 per cent) was found in the age group of below 60 and above years of age respectively.

Mary (2004) found that among the respondents, young and middle aged dryland farmers were equal (42.50 per cent).

Jeyaseelan (2005) observed that nearly half (49.33 per cent) of the senna growers, periwinkle and coleus were found to be young followed by middle (38.67 per cent) and old (12.00 per cent) aged groups.

Kalimuthu (2006) expressed that fifty per cent of the glory lily growers were belonged to the age group of 35 years and below and in the case of senna growers, the average age of the sample farmers was around 44 years. The middle age group was young (26.00 per cent) and old (4.00 per cent) followed by the largest category (70.00 per cent).

Sudhakar (2007) opined that 45.00 per cent of the medicinal plant growers were found to be middle aged followed by young (31.67 per cent) and old (23.33 per cent).
From the above literature, it could be inferred that most of them were young aged.

2.1.2. Educational status

In her study, Manju (2004) found that the educational status of ashwagandha and coleus growers was found to be 14.29 per cent, 52.38 per cent and 33.33 per cent; and 33.33 per cent, 29.63 per cent and 37.04 per cent at up to the level of middle school, higher secondary and graduate levels respectively.

Jeyaseelan (2005) found that observed that around 30.00 per cent of the growers of senna, periwinkle and coleus were middle school educated followed by primary educational level (29.33 per cent) and functionally literate (16.00 per cent) class. A negligible proportion (14.67 per cent) was in secondary school of education and illiterate (8.00 per cent) level.

Kalimuthu (2006) expressed that 40.00 per cent of the glory lily growers belonged to the middle school education, whereas more than half of the senna growers belonged to illiterate category.

Sudhakar (2007) found that 22.50 per cent of the medicinal plant growers were having primary level education followed by illiterates (20.00 per cent), middle school level (15.00 per cent). He concluded that
majority of the growers had education from primary school level to collegiate level.

It may be inferred from the above review that respondents widely with regard to their educational status. No concrete conclusion could be drawn based on these investigations.

2.1.3. Occupational status

In the study entitled, “Cultivation of medicinal plants for the benefit of marginal women farmers in Bhima Catchment’s Area”, Tetali et al. (2002) found that farming was the main occupation for the Mahadeo koli tribal community living in that area, which came under the backwaters of the Chaskaman Dam in Khed Taluk of Pune district in Maharashtra State.

Bharathi (2003) observed that more than half of the senna growers (54.16 per cent) were engaged in farming as their main occupation.

Manju (2004) found that majority (90.48 per cent) of the ashwagandha growers were found to have agriculture as their primary occupation followed by agriculture and service (9.52 per cent) and none was found in the category of agriculture and business, whereas in the case of coleus growers nearly three-fifth (59.26 per cent) of the respondents were having agriculture as their prime occupation followed
by agriculture and business (22.22 per cent) and agriculture and service (18.52 per cent).

Jeyaseelan (2005) stated that among the growers of senna, periwinkle and coleus same trend was also noticed with equal percentage (46.66 per cent and 46.67 per cent) of them had farming as their sole profession followed by 34.67 per cent and 38.67 per cent were having farming + agricultural labourer; 12.00 per cent and 9.33 per cent with farming + business; and a meager percentage of them (5.00 per cent and 4.00 per cent) had farming + services as a business respectively.

Sudhakar (2007) expressed that more than half (51.67 per cent) of the medicinal plant growers had farming as their sole profession followed by farming with the professions of agricultural labour (25.00 per cent), business (14.17 per cent), service (9.16 per cent).

It is clear from the above review that majority of the respondents were engaged in agriculture.

2.1.4. Farm size

Bharathi (2003) observed that the big farmers from senna growers accounted for 29.17 per cent, while the rest were found to be distributed among small (54.16 per cent) and marginal (16.67 per cent) categories.
Mary (2004) reported that exactly three-fifth (60.00 per cent) of the medicinal plant growers were found to be marginal farmers followed by small (28.88 per cent), medium (8.89 per cent) and big (2.23 per cent) farmers.

Jeyaseelan (2005) concluded that exactly two-fifth (40.00 per cent) of the senna growers, more than half (56.00 per cent) of the periwinkle growers and nearly half (46.67 per cent) of the coleus growers were found to be small farmers followed by marginal farmers (32.00 per cent, 36.00 per cent and 36.00 per cent respectively).

Kalimuthu (2006) reported that the average size of land holding possessed by the glory lily growing farmers was 1.96 ha as against 3.19 ha in the case of senna growers.

Sudhakar (2007) found that exactly half of the medicinal plant growers were found to be small farmers followed by marginal (30.83 per cent) and big (19.17 per cent) farmers.

From the above information, it may be stated that in general the respondents were found to have small farmers.

2.1.5. Area under medicinal plants

Prabhakar (2000) indicated that majority (83.33 per cent) of the farmers were under the low category in terms of the area under
medicinal plants followed by high (16.67 per cent) category and none was found to be medium level category.

Bhuse and Ghule (2002) observed that majority of the medicinal plant growers in India is with a marginal holding of less than 2.50 ha of land.

Manju (2004) reported that the mean area under ashwagandha and coleus for an individual respondent were 0.82 ha and 0.94 ha respectively, which were accounted for 35.96 and 36.15 per cent to the total land use prevailing among the respondents.

Jeyaseelan (2005) found that majority (76.00 per cent) of the growers of senna, periwinkle and coleus, apportioned their land area for the cultivation of medicinal plants followed by medium (18.67 per cent) and low (5.33 per cent) levels category.

Kalimuthu (2006) expressed that the sample glory lily growers were cultivating glory lily in about 51.00 per cent of the total area they possessed, where as it was 65.00 per cent in the case of senna growers.

Sudhakar (2007) found that more than half (58.30 per cent) of the medicinal plant growers left a meager area for medicinal plants cultivation followed by moderate (31.70 per cent) and maximum (10.00 per cent) area.
Most of the above studies pointed out, that the respondents in general possessed medium level of area under medicinal plants.

\textbf{2.1.6. Social participation}

Bharathi (2003) found that 58.33 per cent of senna growers had medium level of social participation followed by high (28.34 per cent) level and the rest belonged to the low level.

Mary (2004) reported that half (50.00 per cent) of the medicinal plant growers had low level of social participation followed by medium (31.11 per cent) and high (18.89 per cent) levels.

Jeyaseelan (2005) opined that while considering the growers and prospective growers of medicinal plants in general and growers and prospective growers of senna, periwinkle and coleus in particular the same propensity of social participation was noticed with the maximum percentage in low and medium level categories.

Kalimuthu (2006) observed that around two-third of both the growers of glory lily and senna had medium level of social participation.

From the above review, it may be stated that majority of the respondents had medium level of social participation.

\textbf{2.1.7. Extension agency contact}

Bharathi (2003) concluded that the message for farmers under the present Tamil Nadu Agricultural Development Project (TNADP) for senna
is much limited compared to other crops. This would be the possible reason for such low (63.33 per cent), medium (25.83 per cent) a level of contact with extension agency by most of the senna growers and the contact is limited to 10.84 per cent for high level category.

Mary (2004) reported that almost equal distribution of medicinal plant growers was observed between the three levels of the extension agency contact i.e., medium (37.77 per cent), low (33.33 per cent) and high (28.90 per cent) levels.

Jeyaseelan (2005) observed that over majority (82.00 per cent) of the growers and prospective growers of senna, periwinkle and coleus had low level of extension agency contact followed by medium (15.33 per cent) and high (2.67 per cent) levels.

Kalimuthu (2006) expressed that about 56.00 per cent of the glory lily growers and around two-third of the senna growers were found to be medium level of extension agency contact.

Sudhakar (2007) found that 43.33 per cent of the medicinal plant growers had low level of extension agency contact followed by medium (37.50 per cent) and high (19.17 per cent) levels.

From the above review, it may be stated that majority of the respondents had medium level of extension agency contact.
2.1.8. Mass media exposure

Jeyaseelan (2005) revealed that almost equal proportion of the growers and prospective growers of senna, periwinkle and coleus had low (45.33 per cent) and medium (43.33 per cent) levels of mass media exposure.

Kalimuthu (2006) expressed that the mass media exposure score of the glory lily growers was 7.43 with 56.00 per cent of them came under medium level, whereas the score was 6.76 in case of senna growers with two-third of the respondents under medium category.

The above review showed that the respondents had medium level of mass media exposure.

2.1.9. Risk orientation

Bharathi (2003) reported that nearly two-third (63.33 per cent) of the senna growers were with medium level of risk orientation followed by high (23.34 per cent) and low (15.83 per cent) levels.

Mary (2004) inferred that nearly three-fifth (58.89 per cent) of the medicinal plant growers were taking risks to a medium level followed by high (30.00 per cent) and low (11.11 per cent) levels.

Jeyaseelan (2005) reported that same trend was noticed with regard to the growers and prospective growers of senna, periwinkle and
coleus, who were found to be between medium (49.33 per cent and 40.00 per cent) low (17.34 per cent and 30.67 per cent) levels in taking risk.

Sudhakar (2007) found that 49.17 per cent of the medicinal plant growers had medium level of risk orientation, followed by low (30.00 per cent) and high (20.83 per cent) levels.

Thus, it could be concluded that majority of the respondents had medium level of risk orientation.

2.1.10. Scientific orientation

Bharathi (2003) reported that more than three-fourth (75.83 per cent) of the senna growers possessed medium level of scientific orientation followed by 15.00 per cent with low level and 9.17 per cent with high level.

Mary (2004) observed that two-fifth (40.00 per cent) of the medicinal plant growers were found to have low level of scientific orientation followed by medium (36.67 per cent) and high (23.33 per cent) levels.

Jeyaseelan (2005) opined that with respect to both the growers and prospective growers of senna, periwinkle and coleus, the same trend was noticed with 68.00 per cent and 76.00 per cent of them were seen
between the low (38.67 per cent and 40.00 per cent) and medium (29.33 per cent and 36.00 per cent) levels, respectively.

Sudhakar (2007) found that 46.67 per cent of the medicinal plant growers had low level of scientific orientation, followed by medium (30.00 per cent) and high (23.33 per cent) levels.

From the above review, it may be concluded that the respondents in general possessed low to medium level of scientific orientation.

2.1.11. Cosmopoliteness

Jeyaseelan (2005) expounded that nearly half (48.00 per cent) of the growers of senna, periwinkle and coleus had medium level of cosmopoliteness followed by high (32.00 per cent) and low (20.00 per cent) levels, whereas nearly two-third (62.66 per cent) of the prospective growers had low level of cosmopoliteness followed by medium (26.67 per cent) and high (10.67 per cent) levels.

2.1.12. Export potentiality

Prahalathan (2004) reported that the top 10 highly exported medicinal plants from India include Amla (*Emblica officinalis*), Satawari (*Asparagus recemosus*), Ashwagandha (*Withania somnifera*), Harar (*Terminalia chebula*), Asoka (*Saraca asoca*), Bael (*Aegle marmelos*), Senna (*Cassia angustifolia*), Vasa (*Adhatoda vassica*), Pippali (*Piper longum*) and
Brahmi (*Bacopa monnieri*) which accounted for over 85.00 per cent of total exports.

Jeyaseelan (2005) reported that all the three medicinal plant growers *viz.*, senna, periwinkle and coleus evenly responded that the export potential is low (80.00 per cent, 88.00 per cent and 80.00 per cent respectively).

Lakshmanan and Srinivasan (2005) stated that a lot of export potential for the herbal medicines exists as the current global demand for them is worth Rs. 51,000 crores.

2.2. Knowledge level of medicinal plant growers

The case study conducted by Ramakrishnappa (2002) indicated that every family from Maradavally village knew the uses of at least five medicinal plants for their immediate health care. More than 50.00 per cent of the families had the knowledge of more than 25 species and their availability in surrounding areas.

Bharathi (2003) concluded that almost all the methods of drying were well known by most of the respondents (84.17 per cent), which meant that the farmers possessed adequate knowledge in the post-harvest technologies of senna cultivation.
Shrestha and Dhillion (2003) opined that local communities possess knowledge of 113 medical remedies derived from 58 species belonging to 40 families to treat a wide range of ailments; and despite the gradual socio-cultural transformation, they still possess substantial knowledge of plants and their uses.

Tabuti *et al.* (2003) reported that the existence of traditional medicine depends on the related knowledge of their use as herbal medicine, which is important to the herbal medicine trade and the pharmaceutical industry.

Mary (2004) reported that more than half (54.44 per cent) of the amla growers, more than one-third of the (34.45 per cent) kalmegh growers and more than two-fifth (46.67 per cent) of the tulsi growers had high level of knowledge in their respective cultivation technologies.

Jeyaseelan (2005) reported that the knowledge level of the coleus growers was found to be very high (92.00 per cent) followed by the periwinkle (30.67 per cent) and senna (13.33 per cent) growers. The same trend was also noticed among the prospective growers of the above medicinal plants.

Kalimuthu (2006) observed that more than half of both the the glory lily and senna growers possessed medium level of knowledge in its cultivation practices.
Sudhakar (2007) opined that 43.33 per cent of the medicinal plants growers had medium level of knowledge on coleus cultivation practices followed by high (30.00 per cent) and low (26.67 per cent) levels.

From the above literature, it could be inferred that the respondents had medium to high level of knowledge in medicinal plants cultivation.

2.3. Extent of adoption of recommended medicinal plant cultivation technologies

Prabhakar (2000) reported that majority of the medicinal plant growers adopted only two recommended practices namely method of planting (98.33 per cent) and fertilizer application (81.66 per cent).

Sundar (2002) opined that in general, selected gloriosa growers have not adopted technologies recommended by the Tamil Nadu Agricultural University with respect to selection of tubers, seed rate and spacing. The practices viz manuring, fertilizer, application and plant protection were adopted partially.

Bharathideepa (2003) found that 46.67 per cent of the senna growers had low level adoption followed by high (29.17 per cent) and medium (24.16 per cent) levels.
Vengatesan et. al. (2003) reported that majority of the respondents from the Villupuram district of Tamil Nadu had low level of adoption in *Aloe* cultivation.

Jeyaseelan (2005) expounded that the trend on overall adoption level of the medicinal plant growers cultivating senna, periwinkle and coleus was high (44.00 per cent) followed by low and medium levels, equally (28.00 per cent).

Sudhakar (2007) found that half (50.00 per cent) of the *Aloe vera* growers had adopted the recommended method of planting followed by correct spacing (40.00 per cent), harvesting at appropriate time (36.67 per cent) and propagating techniques (33.33 per cent).

From the above literature, it could be inferred that the respondents were found to had low level of adoption in medicinal plants cultivation.

2.4. Marketing behaviour of medicinal plant growers

Prabhakar (2000) reported that almost all the medicinal plant growers (91.66 per cent) fell under the low level of marketing behaviour, followed by high (6.67 per cent) and (1.66 per cent) levels.

Jeyaseelan (2005) observed that more or less equal percentage of the medicinal plant growers were seen both in high (41.33 per cent) and
medium (40.00 per cent) levels as against the prospective growers of senna, periwinkle and coleus wherein nearly three-fifth (58.67 per cent) of them had low level of market orientation. He also reported that the ‘contract farming’ was considered to be the viable method that found to be suitable for marketing these three medicinal plants.

2.5. Relationship between the characteristics of the medicinal plant growers with their extent of adoption.

Sudhakar (2007) reported that among the thirteen independent variables studied, the variables like educational status and market perception showed a positive and significant relationship at five per cent level of probability and three variables farm size, scientific orientation and risk orientation had positive and significant relationship at one per cent level of probability with the profile characteristics of anola growers.

He further stated that the variables like farm size and credit orientation had positive and significant relationship at five per cent level of probability and four variables age, extension agency contact, scientific orientation and risk orientation had positive and significant relationship at one per cent level of probability with the profile characteristics of coleus growers.

In addition, he also opined that variables like occupational status and risk orientation showed a positive and significant relationship at five
per cent level of probability and three variables viz. extension agency contact, scientific orientation and post harvest facilities had shown a positive and significant relationship at one per cent level of probability with the profile characteristics of sweet flag growers.

With respect to the relationship of extent of adoption with the profile characteristics of aloe vera growers, he observed that variable educational status had shown a positive and significant relationship at five per cent level of probability and three variables viz. extension agency contact, scientific orientation and risk orientation had shown a positive and significant relationship at one per cent level of probability.

2.6. **Constraints faced by the medicinal plant growers in the adoption of medicinal plants technologies**

Sheela (2001) reported that cent per cent of the respondents expressed research and marketing constraints followed by four-fifth (80.00 per cent) of production constraints like lack of good quality seed material, pest control measures and irrigation facilities; and more than two-fifth (45.00 per cent) of storage and processing constraints were noticed among the growers of *Gloriosa surerba.*

Bhuse and Ghule (2002) stated that lack of proper agro-technology, lack of standard source of planting materials and limited
research work on propagation of medicinal plants are the major constraints in production of medicinal plants.

Singh et al. (2002) reported that non-availability of quality material of improved varieties; and lack of development and extension support in the cultivation, processing and unorganized marketing facilities as the main constraints in cultivation of mentha.

Sundar (2002) reported that wide price fluctuation, shortage of labour, lack of skilled labour, large investment on seed tubers and erection of panthal; and allergic to certain human beings as the important constraints in the cultivation of Gloriosa surerba. Kombairaju and Vijayakumar (2005) also quoted the same reasons.

Purushothaman and Kavaskar (2003) found that non-availability of cuttings/tubers, high cost of tubers, long duration, uncertainty of weather conditions, attack of pests, lack of irrigation facilities and lack of marketing facilities were the constraints faced by the farmers growing medicinal yam (Diocorea floribunda).

Ajjan (2004) said that failure to properly follow the practices; absence of standardization in processing; lack of quality control mechanisms and modern technologies; and a veil of secrecy surrounding
the market information constrained the growth of trade in medicinal plants.

Mary (2004) identified that yield loss due to erratic climatic conditions (24.44 per cent), high cost of labour (22.22 per cent), lack of processing industries in the locality (73.33 per cent), insufficient research on medicinal plants based intercropping system (90.00 per cent); and lack of price policy for medicinal plants by the Government (97.78 per cent) as the top most constraint among the ecological, labour, storage and processing, research and economic constraints as expressed by the medicinal plant growers respectively.

Sivaramakrishnan (2004) expressed that oscillation of demand for various medicinal plants, lack of adequate marketing support, erratic fluctuation of prices in the global market, lack of marketing information such as global and domestic demand were the marketing constraints faced by the medicinal plant growers. On the other hand, the traders and exporters also faced the problem of procuring quality produce at one place.

Jeyaseelan (2005) reported that erratic climate, poor quality of inputs, lack of research on value addition of the harvested produce, labour scarcity, lack of trained personnel and equipments, lack of price
policy, high cost of inputs, inadequate supply of information were perceived as the problems by majority of the medicinal plant growers with respect to the nine problems studied viz. ecological, production, technological, labour, processing, marketing, economic constraints, respectively.

Varadharajan et al. (2005) found that scarce availability of medicinal plants, more time consumption in preparing composite medicinal mixtures, longer duration for a good cure were the main problems expressed by the farmers in using ethno-veterinary medicine.

In his study, Kalimuthu (2006) reported that loss of tubers during storage (100.00 per cent), very high level of risk (100.00 per cent), death of plants in the field (92.00 per cent), very high level of investment (90.00 per cent) were the major problems of cultivation as perceived by the glory lily growers against lack of government’s assistance (92.00 per cent) as the main problem as reported by the senna growers.

Sudhakar (2007) reported that improper availability of planting material, lack of fixed price policy as the major problems as perceived by the medicinal plant growers with respect to the production and marketing constraints, respectively.