Planning has been one of the opted strategies of development in India since its inception and despite four decades of planned development, the situation in terms of poverty, unemployment, lack of access of poor to socio-economic amenities, has marginally changed in resource deficient regions such as drought prone areas, desert areas and hill areas. The introduction of sericulture in the drought prone areas can be seen in the backdrop of the above situation. The resource requirements for sericulture need to be assessed on a more systematic and comprehensive manner so as to evolve meaningful credit policies for the benefit of farm community in the adoption of sericulture. Keeping this in view the present study aims at examining the development prospects of sericulture in one of the drought prone districts of Andhra Pradesh viz., Anantapur.

Objectives

1. To provide an account of sericulture development in India, and in the study area, in brief, during the last two decades;
2. To examine the relative importance of sericulture in farm economy in drought prone region;
3. To trace out the adoption of mulberry cultivation and silkworm rearing practices in different farm size categories with a view to identify the constraints at the farm level;

4. To ascertain the costs incurred at various stages during the first and second year of establishment of mulberry garden;

5. To examine the viability and profitability of sericulture and labour absorption capacity in the drought prone region;

6. To ascertain the impact of sericulture on the household economy; and

7. To assess the problems and prospects of sericulture development in a typical drought prone region.

Approach

To make a detailed assessment of the above mentioned specific objectives the following approach was adopted. To appreciate the problems and prospects of sericulture and also its capability to make the household a viable unit of production in the context of a drought prone areas the choice of the study area was made from among the drought prone districts with reasonably good concentration of mulberry crop.

To review the sericulture development a three stage approach was employed. In the first stage a comparative
analysis of area, production and yield of cocoon in India vis-a-vis other major silk producing countries was made for some selected time points. The relative position of India and the change in its position in the global context was delineated. Further a brief account of the efforts made by the country for the development of sericulture during the various plan periods was provided so as to bring the nexus between the government initiatives and the trends in silk economy. At the second stage the progress of sericulture in Andhra Pradesh, the second largest producer of silk in India was reviewed. The share of different districts in area and production, the special efforts of government of Andhra Pradesh for the promotion of sericulture was also studied. In the third stage the sericulture development in the selected drought prone districts of Andhra Pradesh, Anantapur was reviewed with special reference to trends in the area under sericulture, production and productivity of cocoons, the support system including infrastructure extension and financial services.

Socio-economic profiles of the sample farmers were prepared to assess the importance of mulberry crop in the economy of farmers. These profiles would enable us to identify the factors responsible for the choice of sericulture vis-a-vis other competing crops.
Hypotheses

A few hypotheses have been tested: a) whether households with more number of working adults/un - or under-employment/higher literacy levels prefer sericulture; b) large farmers with better access to credit facilities (will) allocate more area under sericulture. The basis for these above hypotheses is that sericulture is found to be labour intensive crop and households with more family labour may prefer to have employment throughout the year in drought prone region where labour utilisation is usually low. Further, the capital requirements are reported to be fairly high and adoption of such crop in a drought prone region requires access to institutional or non-institutional finance. The earlier studies have revealed that the access to credit markets is inequitable and the credit worthiness is related to size of holding.

Since the degree of adoption of farm practices depend on several factors such as awareness, attitudes, and the effectiveness of delivery system, data was collected and analysed about the extent of adoption of cultivation and rearing practices and the problems in adhering to the recommended package in various farm size groups.

In the establishment of mulberry garden a number of activities have to be taken up in the initial year which
are of non-recurring nature. Accordingly, the data on the major items of work and the associated costs for the first and second year were collected from the sample farmers using a structured schedule. In the design of the schedule, the schedules of the farm management studies were consulted. In working out the costs of cultivation the emphasis was laid on 'paid out costs'. For the calculation of the costs of cultivation the unit of analysis is 'one acre farm size' irrespective of the actual acreage under mulberry for various farmers. Valuation was done at 1988-89 prices. Cultivation costs were also ascertained by imputing the family labour based on the wage rates paid to the hired labour in each farm size category for each operation. The economic viability of sericulture crop was judged on the basis of few indicators. (i) net returns per acre; (ii) net returns per household; (iii) output cost ratio (Output-input ratio). Besides these, the net surplus per acre from sericulture was compared with that of competing crops in the area. All those important crops which have been replaced by sericulture in the study villages (will) constitute the set of competing crops.

Labour input for each operation in various farm size categories was recorded. Care was taken to obtain the details on the use of family labour and hired labour. The utility of this critical input is to know
to what extent the sericulture provides employment opportunities to farmers and agricultural labourers in drought prone areas and whether it acts as an insurance. The impact of sericulture on the household economy was assessed in terms of: additional income accrued, savings/investment made (productive or otherwise), priorities in the household expenditure and change in the socio-economic status as perceived by sericulturist.

The problems of sericulture development were enumerated on the basis of collected information (seed availability, marketing of cocoons, price offered etc.) and prospects of sericulture development in drought prone areas were examined, which might help the policy maker in evolving certain policies and programmes for sustainable development of sericulture in drought prone areas.

Sampling Design

For this study, Anantapur District has been purposively chosen. It is one of the drought prone districts of Andhra Pradesh with heavy concentration of mulberry crop. For instance, the district accounts for 39 per cent of acreage under mulberry cultivation in the state and a share of 43 per cent in production during the year 1991-92. Four blocks namely Hindupur, Madakasira, Kadiri (East) and Kadiri (West). Which
account for over 60 per cent of the area under mulberry cultivation were chosen for further examination.

The department of sericulture at the district level maintains the records indicating the number of mulberry growers village wise. This list constitutes the sampling frame for the selection of villages. In all 20 villages were randomly selected with five villages from each block. A list of farmers who have started mulberry cultivation during the year 1987-88 was prepared in all the 20 villages and a random sample of 200 farmers was drawn from this list. Another list of farmers who have started growing mulberry prior to 1984-85 was prepared from the same set of villages and a random sample of 100 farmers was drawn to assess the effect of sericulture on the living standards. Care was taken to retain the same proportion of different farm size categories in the two samples. Thus the sample selection was based on multi-stage sampling design with the first two stages being purposive in nature (guided by a few criteria) and the latter two stages being random.

Study area profile:

Anantapur, is one of the districts identified by Government of India requiring special attention for creation of more employment opportunities. About 75 per cent of the workers in rural areas are either
cultivators or agricultural labourers. Most of the female labour are working as agriculture in the district. The district has been experiencing substantial growth in respect of 'agriculture labour class' during the last few decades.

Nearly 50 per cent of the geographical area is being sown with 16 per cent of it under irrigation cover. It is estimated that about four lakh acres have been receiving irrigation from different sources with wells, accounting for 54 per cent. In other words, substantial proportion of the area irrigated is of protective irrigation type, the dependability of the source varies with fluctuations in rainfall. The district receives about 54 cms of rainfall on an average with more than 70 per cent of it occurring in the South West monsoon period. The rainfall data indicates that the rainfall is erratic as evident by the high coefficient of variation. Though different type of soils are present in the district, Mulberry is usually grown in red soils which is suitable for the crop. Nearly 56 per cent of the operational holdings are small and marginal suggesting the typical farm economy of the district. Among the crops grown groundnut, jowar and paddy account for a larger share in the area.

The district is also identified as one of the industrially backward areas with low employment
potential in the organised sector. The infrastructure facilities appear to be moderate. This is equally valid in the case of sericulture except for the shortage of grainage and reeling units. Special efforts are being made by the district administration for promotion of sericulture through various (DPAP) programmes. The marginal farmers growing sericulture have been provided with the facility of subsidy and margin money in case they belong to the socially disadvantaged groups. For revitalising the rural economy of such drought prone district, whether crops like sericulture provide some stimulus or not needs to be examined in detail.

Status of Sericulture

Sericulture in India is an ancient agro-based industry and is practiced in about 9.4 per cent of total villages of the country. India occupies second position in the silk production next only to China since 1987.

Area under mulbery cultivation and raw silk production has registered a growth of about 219 per cent and 395 per cent respectively in 1990-91 against the base year of 1970-71 and stood at 7.73 lakh acres and 11,487 tonnes of raw silk.

A National Sericulture Development Project at a total cost of Rs.700 crores is taken up spread over a
period of five years from 1989-90 to 1993-94 in the
country. An additional area of 11,336 hectares of
mulbery is proposed to be developed in the country in 12
States.

Andhra Pradesh is the second largest silk producing
state in the country next only to Karnataka. The area
under mulbery cultivation is 1.76 lakh acres which is
nearly 24 per cent of total area under mulbery. It has
the share of 22 per cent of the cocoon production and 25
per cent of the raw silk production. Of the total silk
worm seed produced in the country, Andhra Pradesh
accounts for 7 per cent. In Andhra Pradesh sericulture
is mainly concentrated in Anantapur, Chittoor, Kurnool
and Cuddapah. Nearly 75 per cent of the area under
mulbery is in the four districts of Rayalaseema.

National Sericulture Development Project is being
implemented in Andhra Pradesh with the assistance of the
World Bank and Swiss Development Corporation at a total
cost of Rs.136.40 crores over a period of five years
from 1989-90 to 1993-94.

IRDP has been identified as the major programme to
develop on farm activities of sericulture in the state.
The DRDAs have been contributing substantially for
infrastructure development of sericulture. The
sericulture department is able to tap Rs.41.22 crores in
the form of subsidy from various agencies viz. DRDA, ITDAs, SC Corporation etc. during 1980-92. Thus sericulture is treated as major activity by all agencies to uplift the poor including SCs and STs by generating extensive credit to the sectors. Banks have lent to an extent of 104.78 crores for sericulture activity in the state. The district of Anantapur has been included under Drought Prone Area Programme (DPAP) since 1975. Although groundnut is preferred traditionally as a drought resistant crop, sericulture has become increasingly popular among the drought affected farmers.

The increase in Mulberry acreage per year during the period of 1978-79 to 1991-92 is about 14.75%. The average additional area brought under mulberry cultivation was 4827 acres per annum and its coefficient of variation for the above period was 55.3 per cent.

Cocoon production has gone up from 25 lakh kgs in 1978-79 to 117.13 lakh kgs in 1991-92. The average annual increase worked out to 17.35 per cent. The average production of reeling cocoon was 93.67 lakh kgs per year and its coefficient of variation was 34.80 per cent for the above period.

Of the total area under mulbery in the district a high percentage of area was in four blocks viz. Hindupur (25.35%), followed by Kadiri East (13.47%), Madakasira
(12.24%) and Kadiri West (10.69%). Cocoon production was higher compared to area in the blocks of Hindupur and Kadiri East, indicating higher yields in these two blocks. About 20% of the total area was under improved mulberry variety of M5 in the district.

The number of farmers engaged in sericulture has also increased substantially after 1978 and over a period of 17 years 14 fold increase was observed. There were about 51,000 sericulture farmers in the district. However Scheduled Caste and Scheduled Tribe sericulture farmers were only 6.74 and 3.48 per cent of the total sericulture farmers despite the incentives provided under various developmental programmes. All categories of farming community are cultivating mulbery in the district. Under poverty alleviation programme a total of 9,503 farmers got benefitted upto 1991-92 and on an average each of these sericulturists got a loan amount of Rs.7,138 and subsidy of Rs.4,865. The total amount spent for the development of sericulture under all the schemes during the period of 1976-92 was about Rs.1580 lakh. The important infrastructure facilities provided for the expansion of sericulture in the district include 9 grainages, 14 chawkie rearing centres, 15 seed farms, 6 cocoon markets, 7 silk reeling units, 2 twisting units, 3 technical service centres and one Regional Training Centre.
Profile of sample households:

It was observed that among the sample households 39 per cent of the households were relatively small with a family size of 5 or less members. The average family size for the sample farmers worked out to 6.86. Interestingly, the average family size is found to be more in respect of medium and large farmers (7.26 and 5.51 respectively) than in the case of small farmers. The percentage of workers to the total family size worked out to 54 among the sample farmers' households. (The corresponding figure was of a higher magnitude in respect of medium and small farmers).

The average number of days for which the male and female members were employed per month was 17.18 and 14.81 respectively.

As for the age distribution of sample respondents, about 52 per cent of them were from the age group of 36-59 years and 45 per cent belonging to younger age group of 19-35 years. Among the land holding categories it was observed that a majority of the small farmers were from the age group of 19-35 years while the medium and large farmers belonging to the age group of 36-59 years.

About 62 per cent of the farmers were from the forward caste. The backward caste and scheduled caste
account for 24 per cent of the total number of farmers covered under the study.

Across the land holding categories the majority of small, medium and large farmers were from forward caste. Sericulture farmers were found to have a reasonably good level of education. This was more so in the case of large farmers. About 63 per cent of the sample households were having pucca houses. As expected, a majority of large and medium farmers were having pucca houses while about 49 per cent of the small farmers fall in the same category.

It was observed that 30 per cent of the sample farmers have additional houses which were put to use as cattle sheds or silk worm rearing sheds.

The average size of the total holdings of small, medium and large farmers worked out to 4.00, 7.93 and 19.20 acres respectively.

As regards the operational holdings, the figures for the three categories of the farmers were 4.2, 7.86 and 18.96 acres respectively. However, the average extent of irrigated land was to the extent of 1.33, 2.58 and 5.23 acres respectively for the three categories of farmers.
The 'joint well' was the predominant source for small farmers (53.15 per cent), while 39.04 per cent of medium farmers and about 53.56 per cent of large farmers were depending upon own wells for irrigation purposes. Among the irrigated crops, paddy occupied the second position after mulberry crop among all the three farmer categories. While groundnut (accounting for 13.41 per cent) occupied the third position in the case of small farmers, ragi and sugarcane took the third place in respect of medium and large farmers respectively.

Among the unirrigated crops, groundnut is the major crop accounting for more than 85 per cent across all the three land holding categories.

Mulberry cultivation and silkworm rearing practices

An understanding of cultural practices with reference to recommended practices for cocoon production is a pre-requisite to examine/ascertain the economics of sericulture in the district at the farm level. The following are few selected observations on cultural practices adopted by the farmers.

Size of the mulberry holding has a bearing on the cultivation practices adopted and majority of the farmers have half an acre and one acre farm sizes and farmers upto one acre of mulberry garden are 87 per cent.
About 79 per cent of farmers had to replace the crops grown earlier and the rest of the farmers have brought in additional areas under plough to grow mulberry.

About 27 per cent of sample farmers have adopted improved variety of mulberry i.e. M5 and small farmers rank high with 44 per cent of them having adopted because many of them had come under the fold of sericulture development programme. All the farmers used only cuttings for plantation and Row system of planting has been adopted in the district. However the sample farmers do not seem to maintain the spacing as desired between rows and plants. They believe that higher plant population can give more leaf which may not be always true.

Almost all the farmer have used either manure or fertilizer or both. Usage of farm yard manure and fertilizer was reported by 87 per cent and 93 per cent of total sample respondents respectively and quantum of farm yard manure applied was low compared to the requirement. Very few farmers used pesticides to control pests. There was not much variation in the schedule of irrigation among different categories of farmers and about 39 per cent of the sample respondents were not giving sufficient irrigation. Only 12 per cent of the
farmers adopted the practice of plucking the leaves from the farm itself.

In all only 46 per cent of the farmers feel that the plants can survive beyond 7 years. About 7 per cent of the farmers were aware of the existence of silkworm rearing cooperatives. Normally a part of the residential house was utilised for silkworm rearing by majority of the sample respondents. Mean plinth area for silkworm rearing of 250-300 DFLs fell short by about 22 per cent of required area.

Equipment, stands and trays used for silkworm rearing were mostly owned by all the farmers and 'chandrikas' by about 62 per cent of the sample farmers only. Sericulturists borrow and exchange chandrikas to meet their requirement since they are required for short period.

Investment on rearing equipment was Rs.3469 for medium farmers which was highest followed by Rs.3187 for large farmers and Rs.2469 for small farmers and the average for all farmers worked out to Rs.2992.

About 72 per cent of the farmers procured the DFLs from within the district either through government grainages or from private grainages and the rest from outside the district. While the small farmers mostly
depended on the local sources it was medium and large farmers who visited neighbouring states for DFLs. About 83 per cent of respondents procured DFLs in time. It was reported that measures like disinfecting, maintaining optimum humidity were practiced by majority of the farmers. About 74 per cent used curtains to protect silk worms from UZY Fly.

Our study revealed that categorywise small farmers performance was better in mulberry cultivation practices compared to others. The cumulative percentage of required practices adopted shows that small farmers score was 74.9 followed by 73.3 and 70.5 per cent for medium and large farmers against the cumulative score of 72.9 for all.

On an average majority of sample farmers harvested 3 crops in first year and 4 crops in 2nd year and only few farmers preferred to rear silk worms during the summer months of April and May.

Marketing practices Sericulturists generally take their cocoon to the nearby regulated markets. Categorywise about 80 per cent of small and large farmers sold their cocoon in regulated markets where as 33 per cent of medium farmers sold their cocoon outside the state. Majority of farmer transacted the cocoon with in the distance of 70 km. Average distance cocoon transported
to markets by small, medium and large farmers was 31 km. 76 km and 33 km respectively and mode of transport was mostly by bus/lorries. Average quantum of cocoon per holding harvested/marketed by small, medium and large farmers worked out to 51 kg, 60 kg, and 63 kg. respectively followed by 58 kg. for all the sample households. Very few respondents got remunerative price. The average price realised per kg. was Rs.55. For large farmers it was Rs.59 which was highest. The average transport costs incurred per kg. of cocoon transported to markets by small medium and large farmers was about Rs.1.40 Rs.1.72 and Rs.1.65. Average transport cost for all the sample farmers was Rs.1.57. Regarding the financial assistance received, of the total sample respondents about 56 per cent of small farmers and 33 per cent each of medium and large farmers had received financial assistance from the Government and Financial Institutions.

Economics of cocoon production

Cocoon production is organised on a cottage industry basis as an ancilliary to agriculture in the study area. The acreage under mulberry in the sample farm households was about 180 acres. The main elements in the cost of production of cocoon are: Cost of mulberry cultivation, cost of rearing silk worms and marketing costs.
The cultivation costs were found to be higher in the first year as the farmer has to incur certain costs towards land preparation and material required for planting. The major items in the cost basket are ploughing and land preparation, irrigation, earthing and weeding, fertiliser and farm yard manure. It was estimated that the cost of cultivating mulberry per one acre was Rs. 2,500 in the first year and Rs. 2,300 in the second year.

The cost of cross breed disease free layings (CBDFLs) is the major item in the total costs of rearing silk worms. The cost per rearing of silk worms was found to be of the same order in the first and second years. However, the total costs of rearing varied due to the change in the number of rearings per year. The small farmers have an edge over other farm classes as far as rearing costs are concerned.

The production of cocoons was 207 kgs and 263 kgs per acre during the first and second years which were well below the average yeild of the district and also the expected levels. The marketing costs worked out to Rs.437 per acre. Thus the cost of the cocoon production per acre worked out to Rs. 6,106 for the first year and it was Rs.6,630 for the subsequent year. In the total costs the mulberry cultivation accounts for 42 per cent
and rearing costs amounted to 52 per cent. The higher share for rearing activity was due to the higher labour input use for this activity.

The price received per kg of cocoon varied around Rs.54. After deducting the paid out costs the net income per acre from sericulture activity was of the order of Rs. 7,700. The economics of sericulture, if imputed value for the cost of family labour is taken into account, gives an altogether different picture. The imputed wage cost worked out to more than Rs. 4,000 per acre per annum.

In drought prone areas, one of the chronic problems is un- and under-employment among the agriculture labour class and cultivators. It is to be noted that on an average one acre of mulburry provides employment to the tune of 386 man days and 439 man days respectively during the first and second years. In other words one acre of mulburry would productively absorb about 1.5 persons throughout the year. Interestingly the family labour usage was more in the rearing activity when compared to mulburry cultivation.

Economics of sericulture vis-a-vis the competing crops:
The advantages of sericulture were examined in terms of net income per acre, employment per acre and also net
income per unit of water, when compared to the competing crops viz., groundnut and paddy in the study area. The relevant data are given below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Paddy</th>
<th>Groundnut</th>
<th>Sericulture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income per acre (Rs.)</td>
<td>1960</td>
<td>2317</td>
<td>7700</td>
</tr>
<tr>
<td>Employment (mandays)</td>
<td>180</td>
<td>92</td>
<td>440</td>
</tr>
<tr>
<td>Net income per unit of water Â</td>
<td>28</td>
<td>154</td>
<td>118</td>
</tr>
</tbody>
</table>

* Estimates are given for Double crop.
Â Unit of water is measured in acre inches.

It can be gleaned that the sericulture has edge over other crops which will influence the farmers' decision in its favour. However, the water use efficiency-wise, sericulture ranks second and is next to groundnut.

Impact The farmers who have been growing sericulture for the last 5 years and above, were consulted to assess the impact of sericulture on their socio-economic status, the savings, investment and also the expenditure pattern. The large farmers, as expected, could improve their economic status after opting for sericulture but not so with respect to their social status. The small and medium farmers gained both with respect to the social and economic status. The probable reason for the increase in their social status could be their position
in the labour market in terms of providing employment to others. The additional income has been spent on basic as well as non-basic goods and services. However, with increase in the family size/economic status, there has been a shift in the consumption pattern from basic needs to other goods and services. It is to be noted that the savings habit became an integral part of the household decisions for most of these farm houses and the investments were mainly directed towards improvement of their land or irrigational facilities besides investment in terms of (purchase of) live stock.

Problems of sericulture

Sericulture like any other agricultural enterprise is not free from the problems pertaining to organisation, marketing, finance, technology extension etc. Shortage of CBDFLs: There is a shortage of 85 per cent of cross breed disease free layings in the district and farmers go a long distance to procure CBDFLs at high cost and sometimes for inferior quality. Shortage is more acute during the summer months. Only 4 million DFLs are produced in the district. Our study reveals that about 17 per cent of sample respondents could not procure the DFLs and about 32 per cent of sample respondents complained about quality of DFLs in the study area.
Insufficient Credit Support One of the major hurdles in sericulture development is insufficient credit support and 58 per cent of the sample respondents could not receive any sort of financial support. Most of the farmers feel that easy and speedy procedures have to be adopted by the financial institutions to provide credit.

Shortage of Irrigation Water and Power Supply Owing to the frequent occurrence of drought most of the wells go dry often. About 54 per cent of the sample respondent expressed problems due to shortage of irrigation water in the study area. Problems of low voltage and irregular power supply was also expressed by some farmers.

Inadequacy of Separate Rearing Sheds Most of the sericulturists (about 74 per cent) were rearing the silk worms in residential houses where it is difficult to apply disinfectants. The diseases that affect the silk worms result in poor quality of cocoon formation. Though sericulturists were aware of the importance of separate sheds they did not have resources to construct separate sheds for sericulture. Our study reveals that no proper sanitation was taken up by 24 per cent of the sample respondents and disinfectants had not been used by 7 per cent and proper ventilation could not be maintained by 8 per cent of the sample farmers.
Lack of skills/technical knowledge Many of the sample farmers did not have sufficient knowledge of growing mulberry and rearing of silk worms. Sericulturists need to be trained by the experienced sericulturists and extension staff in rearing silk worms.

maintenance of optimum humidity and temperature It is reported that the crops raised in summer by the sericulturists had failed due to higher temperature. About 23 per cent of farmers could not maintain optimum humidity and temperature.

Problems of Marketing There are only 6 regulated markets in the district and only 35 per cent of the cocoon produced in the district was transacted in these regulated markets and the rest finds its way to other markets particularly to Karnataka state. Cocoons are purchased by reelers in an open auction system on a visual examination of lots and no elaborate methods on the testing of cocoons prior to the sale are followed, hence prices after do not go by quality, besides considerable amount is spent towards marketing costs which include transport costs and commission from the sale proceeds.

Price fluctuation There are wide variations in cocoon crops during the period of study and prices were fluctuating severely within the market and from market
to market and also quite marked between the seasons. On an average 15 to 20 per cent price variation is observed in the prices obtained in the regulated markets of the district and those in Karnataka. During the year of study, the minimum and maximum prices the sample farmers received varied from Rs.30 to Rs.80 and average price the farmers could get was only Rs.55 per kg of cocoon.

Inadequate Reeling activity The cocoon processed in the district both under government and private sectors put together worked out to 25 per cent of the total cocoon production in the district in the year 1990-91. The reason being unsatisfactory working of existing reeling units, besides inadequate number of reeling units and absence of local market for yarn. Quantum of financial assistance to the private reelers towards working capital was reported to inadequate.

Extension Support Mulberry cultivation and silkworm rearing demands high degree of the skills and attention compared to other crops like paddy, groundnut etc. which is rather lacking with the silkworm rearers in the study area. Availability of adequate extension staff and dedicated service of the extension staff are prerequisite for the growth of sericulture. The farmers felt that the extension support was not satisfactory. About 39 per cent of sample respondents felt that they could not get adequate extension support.
Concluding remarks

From the above analysis it is evident that sericulture which is a high valued crop can facilitate the rural transformation in drought prone areas by not only stabilising the farm incomes and providing employment on a large scale but also go a long way in improving the standard of living of the people. However, the following aspects need consideration in the efforts for promoting sericulture in DPAP areas.

1. It has been noted that hardly 20 per cent of the area under mulberry has been covered with improved / high yielding variety in the district. To increase the productivity and also to fetch a higher price, the supply of M 5 variety of mulberry cuttings needs immediate action if necessary by promoting private nurseries. There is a need to enhance the grainage facilities in the district to make up the existing demand gap as well as future needs. However, the Quality Control mechanisms should be made more effective to ensure the quality of DFLS.

2. Not all the sample farmers could adopt the recommended package of practices in-toto and one of the identified constraints for non-adherence is non-availability of adequate credit. Our study
indicates that the credit limits for working capital and fixed capital need to be raised substantially to enable the farmers for adoption of the practices prescribed.

3. Though sericulture is a high valued crop the yields are sensitive to fluctuations in rainfall in the arid zones. Since the investments are fairly high there is justification for introducing crop insurance scheme for sericulture as one of the possible alternatives for protecting the interest of the farm community.

4. The rearing of the silk worm requires the controlled conditions in terms of temperature maintenance, so there is a need to strengthen and widen the extension activity to educate the growers and also to develop indigenous low cost methods for creating those desirable conditions at the household level.

5. Given the short duration between harvesting of cocoon and reeling activities, most of the farmers will be compelled to enter into distress sale. Steps should be taken for protecting and preserving the quality of cocoon for a longer duration by providing service facilities for stifling the cocoon by providing hot air chambers.
6. Marketing is one of the sensitive area which needs special care. It has been observed and reported that the weighing practices are not very satisfactory to the farmers. Since this has direct relation with the incomes of the farmers, the electronic weighing machines need to be introduced in all the markets. Further the marketing margins are found to be on rather high side which implies that there is scope for increasing the marketing efficiency whereby the net income of the farmers can be supplemented. Expansion of reeling units may be considered as a part of the total exercise in improving the marketing efficiency.