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India is a varietal emporium of medicinal plants. It is one of the richest countries in the world as regards genetic resources of medicinal plants. Even though the landmass of India occupies only two per cent of the globe, it occupies 11 per cent of the total known world flora and is one of the world's top 12 mega diversity nations. Two of the '18 hot spots' in the world are in India. More over the agro climatical conditions are conducive for introducing and domesticating new exotic plant varieties. The Indian system of medicine, Ayurveda, Sidha and Unani uses over 2000 medicinal plants of which Ayurvedic system of medicines uses about 700, Sidha – 600 and Unani – 700 medicinal plants in our country.

Kerala with its abundance of luxuriant flora is synonymous with Ayurveda is possibly the only state in the country where Ayurveda continues to be practiced in its purest form. About 1000 medicinal plant species are grown in the States. Out of these, about half of them are in great demand for routine use in the different indigenous system of medicine. There are about 853 pharmaceutical units in Kerala out of which a dozen of them consume about 50 per cent of the total plant based raw materials produced and used for drug manufacture. The demand for Ayurvedic medicine in the State is growing at a compound rate of 10-12 per cent per annum. A similar trend is expected globally also. We expect marketing of herbal medicines worth US \$ 5 billion per year by 2010 in Kerala.

There is no published estimate for area under cultivation of medicinal plants. However, the approximate

Potential of medicinal plants



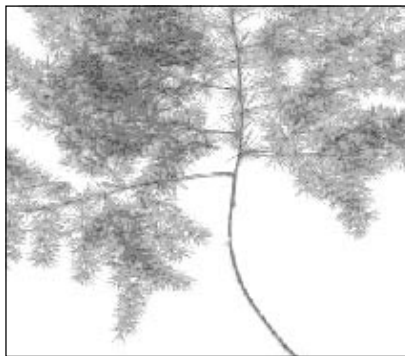
annual demand of medicinal plants by the ayurvedic drug manufacturing industry in Kerala is indicated below.

Demand and supply at present is mis-matching. At present 90 per cent of the supply is from forest and only 10 per cent by way of cultivation. Traditionally, the tribes and local communities living in and around forest were allowed to collect minor forest products and there are only 80 medicinal plants in the list of minor forest products. Due to non-identification of entire medicinal herbs from forest, a lot of herbal items are uncollected and lost. Similarly due to unscientific, unsustainable and discriminative collection practices followed, availability of medicinal plants in its natural home has been depleted over the years. Some of the species even became scarce due to over exploitation. Rapid expansion of area under food crops and commercial crops, conversions of non-forest areas for other alternate land use, degradation of forest through fire, grazing etc. have reduced availability of valuable medicinal plants. This has further led to extinction of many valuable medicinal plants. Many others are endangered. Therefore efforts are necessary for reintroduction of medicinal plants and eco-restoration for enhancing availability of medicinal plants. Medicinal plants that are facing threat of existence, should be identified and immediate steps should be taken for conservation for insitu and exsitu programmes. Kerala forest has about 550 medicinal herbs in the abode. Development of Herbal Sanctuaries for conserving and safeguarding the biological wealth will be very helpful and useful in this regard.



*Periwinkle (Catheranthus roseus)
The anti-cancerous drug - 'Vincistrine' is
prepared from this plant.*

The difficulties experienced in the collection of plants from forest and the problems encountered there in together with heavy demand of medicinal plants necessitate domestication of medicinal plants. Cultivation at present is dictated by user industries since they are fixing the price. They go for cheaper alternatives in order to have a grip in price of medicinal plants. Therefore for quick disposal and for fair price a well-knit buy back arrangement is essential. This is perhaps the most important limiting factor for large-scale cultivation of medicinal plants. The pharmacies and cultivators should enter into mutually agreeable contract for the procurement of medicinal plants at pre fixed price in return of assured steady supply of genuine and right species of medicinal plants.



Asparagus : Effective in curing skin diseases

Commercial Cultivation

Scope for commercial cultivation of medicinal plants as monocrop is very much limited in Kerala, But a lot of potential and scope exists when it is cultivated as intercrop in coconut and rubber plantations. Coconut grown in 9.05 lakhs Ha, and Rubber grown in 4.75 lakhs Ha. are potential areas for intercropping. The research works carried over by Kerala Agricultural University have found that patchouli long pepper and Kaempferia can be successfully cultivated as intercrop in coconut garden. Senna can be very well cultivated in arid rain shadow tracts of Palakkad district. Koduveli, Karimkurunji and sarpagandhi could be planted as intercrop in rubber plantations.

Medicinal plants like, Koovalam-Aegle marmelos, Thippali-Piper longum, Kacholam-Kaempferia galanga, Chethi koduvel-Plumbago rosea, Chittarutha-Alpinia galanga, Adalodakam-Adhatoda vasica, Neelayamari-Indigofera tinctoria, Vayambu-Acorus calamus, Pathimukham-Caesalpinia sappan, Asokam-Saraca indica, Amukkuram-Withania somnifera, Satavari-Asparagus racemosus, Kasthurimanjal-Curcuma aromatica, Narunandi-Hemidesmus indicus, Koduveli-Plumbago rosea, Karimkuringi-Strobilanthus haenianus, Iruveli-Coleus zeylanicus, Orila-Desmodium gangeticum, Muvila-Pseudarthia visida, Chittamrithu-Tinospora cordifolia, Adapathiyen-Holstemma annulare, Patchouli-Pogastemon cablin, Sarpagandhi-Rauvolfia serpentina etc. are recommended for commercial Cultivation in Kerala.

Homestead cultivation

Homestead cultivation of medicinal plants need to be encouraged. The available little space can be well utilized with suitable varieties. Medicinal plants suited for homestead farming are Adalodakam-Adhatoda vasica, Brahmi-Bacopa monniera, Vayambu-Acorus calamus, Ocimum-Ocimum sanctum, Osimum basilicum, Cheria Adalodakam-Adhatoda beddomei, Kacholam-Kaempferia galanga, Thippali-Piper longum, Satavari-Asparagus racemosus, Iruveli-Coleus zeylanicus, Kumari-Aloe vera, Neelayamari-Indigofera tinctoria, Asokam-Saraca indica, Neem-Azadirachta indica, Ginger-Zingiber officinale.

Export promotion

Some medicinal plants have export value. The export (75.80%) is mainly to developed countries like USA, Germany, France, Switzerland, UK and Japan. The important medicinal plants cultivated in Kerala are Kumari-Aloe vera, Vayambu-Acorus calamus, Medicinal yam-Dioscorea floribunda, Senna-Cassia angustifolia, Thakara-Cassia tora.

Government of Kerala through Department of Agriculture is supporting cultivation of medicinal plants

Herbal Biovalley

Region extending from the Silent Valley Biosphere Reserve up to Wayanad will be developed as a Herbal Biovalley for providing biological software essential for medicinal plant industry. Seed multiplication, elite planting material production, producer oriented marketing etc. will be undertaken through this biovalley.

Establishment of Demonstration plot

Variety suitable to a particular locality and of good demand will be raised as demonstration plot. Incentive will be given to plot owner for producing planting material and making available maximum quantity of the seed material to the interested farmers of the locality.

Incentive will be given to farmers/institutions/NGOs for cultivation of medicinal plants in new areas.

Training to farmers and extension agencies

Farmers and extension agencies will be trained on scientific ways of harvesting and transportation of medicinal plants.

Cultivation and processing of medicinal plants are very labour intensive and have tremendous potential for employment generation and poverty alleviation. More than one million people are engaged in gathering, processing, manufacturing and marketing of Ayurvedic drugs. There is a growing demand for herbal-based medicines both in India and abroad. Therefore the demand for raw material will also be increased correspondingly. Cultivation of medicinal plant is a potential resource for uplifting state economy. Growers association or women groups on the model of Self help group could be formed and cultivation can be undertaken by them so that memorandum of understanding with companies for the quick disposal of the same could be made effectively. Herbal estates could also be promoted for facilitating cultivation, processing and marketing of medicinal plants and herbal medicine.

The present decade is witnessing re-awakening in the use of herbal drugs. Over 300 million people in India are solely dependent on Ayurveda for maintaining their health. The medicinal plants as a whole occupy a stable place in modern medicine as the industry is showing special interest in synthesizing natural substances as they are found to be more effective in particular applications. It provides a complete system of healing and prevention of disease. Herbal drugs are becoming popular because herbal medicine is holistic medicine, it is able to look beyond the symptoms to the underlying systemic imbalance, when skillfully applied by the trained practitioner, herbal medicine offers very real and permanent solution to very real problems. . In fact this centuries old nature friendly medicare system has stood the test of time and holds promise for the present and future.



S. Harikumar

In this era of hightech vizardry, our traditional utensils are going begging and the present generation is getting more and more addicted to frenetic life styles while the wrinkles grow wistful about that good old culture. Omalloor Vayal Vanibham (Paddy Field Trade) gives them an opportunity to feel the frolic scenes of the remains of that bygone culture, once in an year. This annual fair of cattle, farm products and utensils, is the biggest of it's kind in Central Travancore which attracts people at large from many parts of the state.

The events of the vanibham commence with a cattle fair on the first day of the Malayalam Month Meenam and last for one month. Though the splendour of this fair is losing year after year with decrease in number of cattle, traders from the southern parts of Kerala and cart vendors from Thirunelveli and Shengottai make their presence still, but for a single day's dealing.

Elders here reminiscence of a time when the villagers used to wake up in the wee hours to see the herd of cattle turning up, jingling their neck bells, pausing near the hay stacks and snorting at each other. Chucking them gently, their sturdy and beedy-puffing owners would stop before the tiny shops offering jaggery cofee, untying their towel head-arounds. By morning the board and reaped fields would be filled with live stock and bullock carts. The procession of cattle could still be seen till the morning of the following day, impeding the road traffic. Late comers would find space at the courtyards nearby. Children would not be let out of the house holds, fearing bull's hit. Hubbubs of trade would intensify with the rising sun. Spectactors would loaf around to see the hale and well fed bullocks standing check by jowl with an abstracted glance and the charcol black buffaloes whisking tails, irritated by the setting flies. Wheeling and dealing would last for three days.

Though all these scenes have become a part of granny's old tale, cattle trading still occurs moderately. A welcome relief is felt as the Grama Panchayat has taken steps to preserve and rejuvenate this, by organising cattle shows and bestowing awards to the owners of the best pair of oxen and buffaloes.

Omalloor village has a significant place in the social and cultural histroy of Central Travancore. It was called "Omal Nel Ooru" (A beautiful land of paddy) during Sangham era, which was later shrunk to "Omalloor" according to history. As far as "Vanibham" is concerned there is no evident information about the orgin of this fair. Legend has it that once a fuddled bull rushed northwards from Velinalloor, a place is South Travancore. During its race, it was caught up by an old *Karanavar* and was tethered to a *pala* tree here in the middle of the paddy field. It is believed that the *Karanavar* was Lord Raktakanda Swamy himself, who is the diety of the temple here. The cattle fair is believed to have started

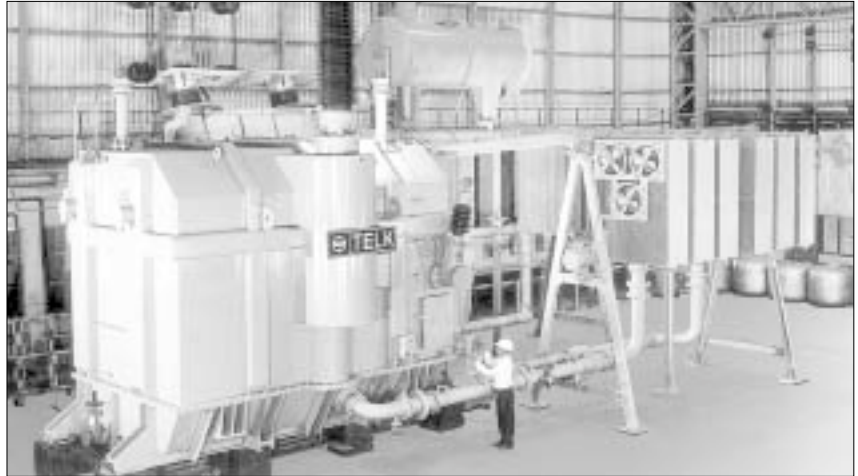
Testimony of competence

since then, to commemorate this event. That legendary *pala* tree is still seen here.

Another major attraction of Vanibham is the market of farm products, utensils etc . Widely acclaimed for its variety, one can have seed items, seedlings of tubers like yam, ornamental plants, farm utensils, vessels,spices, pieces of handicraft, and what not from the flamboyant stalls, spread along either side of the road and in the market.

Vendors of Bronze,bell-metal and Copper vessels from Mannar, Kollam and Kayamkulam encamp here during Vanibham, whose items are masterpieces of intricate workmanship. During these days Omalloor market becomes a tryst for the sellers of confectionery, peacock oil, almanac, snacks, snuff, sandals, drapery, fresco etc...giving an embellishment to the folk culture of this fair.

A village once famous for its suave wrap around of paddy fields, Omalloor is yuppified beyond recognition now with the increasing construction activities, after filling up the paddy fields, and thus destroying this regions loveliness completely the practitioners of consumerism may feel such events like Vanibham as worthless. But those who love our culture and tradition have a question in their minds-"Will this elegant fair withstand the test of the time?"



P.A. Abdul Rasheed

PRO, TELK

Transformers and Electrical Kerala Limited (TELK) has designed 630/3MVA transformer, the largest transformer in India. Mr.P.K. Kunhalikutty, Minister for Industries formally released the transformer on May 16, 2003 at Angamali.

TELK has bagged the order for design and manufacture of 630 MVA, 400 kv Transformer –3 phase Bank (120x3) and one spare transformer through a stiff global competition. The order value of these 7 Transformers is Rs.26.24 crores. These 7 Transformers are intended for Tarapur Atomic Power Projects Three and four, of Nuclear Power Corporation of India Limited (NPCIL). TELK bagged this order through M/s Larsen and Toubro, which executing the Project for NPCIL. The design and manufacture of these giant transformers are first of its kind in our country and is an eloquent testimony for TELK's technical competence and capability.

Salient design features

A three legged (center leg +2 side legs) core construction using superior quality CRGO lamination is adopted. Diameter of the center limb is 1450 mm which is the largest so far manufactured in TELK. D-type yoke construction is adopted to restrict iron losses. Overall weight and dimensions of core are 111 Tonnes and 4.1m x 3.8 m.

This transformer has three windings, the LV, the HV and the regulating winding arranged around the core in that order. Current rating of LV winding is 10,000 A and this calls for special design consideration to limit the stray loss and short circuit forces. Imported CTC (continuously transposed conductor) is used for the winding of all three coils (LV, HV & Tap). LV winding is of triple helical and HV winding is of open pitch continuous disc type. Being a 400 KV Generator Transformer, special care was given at every stage of the winding and dielectric design. Computer calculations developed by HITAC I & TELK were used for the design to ensure that the transformer meets all the stringent specifications.

Due to the large sized conductors used and the overall size and weight, special jigs and fixtures were developed and used for winding and handling . The vertical winding machine platform was modified for winding the large sizes coils. Overall weight of the core-coil assembly (without oil) and the main body of the transformer are 137 Tonnes and 160 Tonnes respectively.

All bushings are manufactured in TELK and are suitable for environment at Tarapur. TELK make off circuit tap changer is provided for voltage variation. ●