Graceful products from coconut garden remnants

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Introduction

Coconut palm is a huge plant composed of several parts botanically differentiated into stem (trunk), leaf (frond, leaflet), inflorescence (spadix), fruit (coconut), roots, etc. The major economic part of the palm is the fruit, the coconut, which is harvested at different stages of maturity as per the markets or consumer's need. Coconut is used as tender coconut; matured nut for culinary, dessert purposes and for processing into several value added products; and fully matured nuts for seed value.

Value addition in coconut

Whatever be the purpose various parts of the nut fetch the farmer additional value. The encompassing husk in case of matured nut adds some revenue where the coir related activities are being undertaken. Coconut shell is a major byproduct in the processing chain of various products like copra, coconut oil, desiccated coconut, coconut milk, cream, milk powder, virgin coconut oil, etc. Coconut shell is used as fuel in these processing units or for making shell powder, charcoal and the high end product, activated carbon.

Other parts of coconut palm like leaves, leaflets, trunk, etc. are utilized for making thatches, broomstick, beams, furniture, etc. in various parts of the country. The unused portions of various parts of coconut palm are converted as manures for application in the coconut gardens or allowed to decompose in a normal way. Handicrafts, artifacts and other utility items made out of whole coconut, shells, coconut wood, leaflets are also popular across all coconut growing countries.

Utilisation of garden waste

Coconut inflorescences, which bear the coconut fruits, after removal of coconut, are mostly left out in the farm itself as a waste or used for fuel purposes. Though these do not find much industrial utility, it carry aesthetic values for artisans.

The coconut palms take around 5-7 years for the first bearing after planting, in case of Tall varieties. The Dwarf varieties start flowing from 3-4 years. The inflorescence, the cluster or bunch of flowers, of the coconut palm is called 'Spadix' that develops in the axil of each leaf. The spadix has a spear-like shape, stout and erect, with a length of about 1 to 1½ metre.

When the inflorescence is mature, the tough 'spathe' which encloses the inflorescence splits and opens over its entire length. The inflorescence is branched and lying close to the main axis. The branches are called 'spikes', which may count 20 to 65 in number. Female flowers, which later develop as fruits (coconuts) after pollination, are located at the base of the spikes while the rest of the spike being fully covered by male flowers.

The coconuts are normally harvested as whole bunches with the encompassing spathe and the coconuts attached to the spikes. The spathe and spikes attached to the main axis are left over in the field, after separation of coconuts.

Traditional uses

The coconut spathe is very hard and boat shaped. The spathe as such is cut into pieces of desired shapes and assembled as container. This is worn as a waist pouch by the coconut palm climbers to carry tools like knives, agricultural chemicals, etc. to facilitate harvesting of coconut or neera tapping and to undertake plant protection measures in the crown.

Traditional coconut climber with coconut spathe bag

Coconut Spathe Fiber

In the southern peninsular region of the country, the spathe is retted in water for few days and torn into longitudinal strings which are generally used for tying the coconut leaf thatches with the roof structure while making huts.

However, these things are not commonly used nowadays due to the availability of other alternatives. However, the bunch wastes can be upgraded to articles, which can have higher value than lying and decomposing in the farm itself.

Novel ideas for utilization of coconut garden remnants

Artisans can visualize any item from a different perspective. The human brain can explore and showcase any item, whether it is a waste or a costly product, beyond imagination and recognition.

The spathe of coconut inflorescence has many uses. When green it can be easily cut and shaped. The only disadvantage of the spathe is that it catches molds easily especially during rainy season. But it can be washed. The spathe can be polished and varnished to make light in weighted strong containers. The spathes can also be bent to desired shapes. Sturdy handles can be made from the spathe for all types of baskets and purses. The spathe is widely used to make long tray like holders for food, arrangements and centerpieces. Wall hangings with spathe add aesthetic value.

The coconut bunch, the main axis and the spikes, after removal of coconut can be used for making beautiful craft items. These are hard structures and take years for disintegration in open conditions. The spikes are strongly attached to the main rachis. They are sturdy which remain erect at the angle attached to the main rachis, unless heavy accessories are fixed to add ornamental value. Similarly the perianth, called as coconut caps in general, at the top of the coconut fruit can also be put use in several handicraft items. Six perianth lobes are arranged in two whorls more or less of the same size and shape. The margins of petals overlap one another to make the perianth compact.

Several eye catching craft items are being created by the artificers using the coconut caps and the spikes. Bottle arts, wall hangings, flower bouquets, etc. are prepared. Similarly, the coconut leaf art can also be practiced. The coconut crown normally bears 30-36 green leaves of uniform length. The mean annual leaf production in mature Talls is about 14-16 leaves and for dwarf palms it is around 21. The leaf ranges upto 7 m in length in Talls and upto 4 m in Dwarfs. The main rachis of the leaf is fleshy.

The average length of the petiole may be about $^{1}/_{4}{}^{th}$ of the total leaf length and continues as the midrib of the leaf. It is slightly concave at the upper side and round at the underside. The leaf base connecting the stem is thick, fleshy, fibrous and broad. The petiole is attached to the stem by means of a sheath in the form of a bracket firmly clasping the stem with its wings almost around it.

When the leaves are cut and removed from the crown, the leaflet part either as such with midrib is used for making thatches or the leaflet midrib is separated for making broomsticks, in most of the cases. Thus petiole/ sheath are left in the garden itself, which are in general used for fuel purpose.

The 1 to 1.25 m long petiole can also be utilized for making craft items. Palm frond art is practiced by many artisans in India and abroad. Due to the strong nature and the typical shape of the coconut petiole, the artisans make them into art pieces of higher value.

One more part of the coconut that is discarded as a waste is the leaf sheath. Nowadays the cleaned and washed sheaths are cut into geometrical shapes of various sizes for using as canvas, base for wall hangings and other handicrafts.

In a new art form, figures are also created on coconut frond, the whole leaf with midrib and leaflets.

Market potential

The present day world is after

Coconut palm inflorescence perianth craft

Art on coconut palm fronds

novel items and organic products. 'Best out of waste' is the concept inculcated among the children since schooldays. The new term of 'Organic Sculptures' is getting popular among the urban flock and the interior designers. These art forms are now getting popular even in non-coconut growing countries. These hardy structures with suitable polish, varnish and colour paints can also be displayed outdoor. Use of organic painting materials adds value to the product. It is well known that art was used to be made with organic materials for millennia using pigments derived from mineral and plant matter, before the advent of synthetic chemicals.

The market demand for ornamental articles made from coconut wastes may be minimal but it can be taken up as main profession or as a part time activity by people of any sector for increasing the income. The coconut spathe, bunch waste and frond art are sporadically taken up as a profession by artisans in Tamil Nadu, Karnataka and Kerala. By random browsing in the internet, it is observed that the spathes are sold as high as 30 US$ per set of 5 no. Musical instruments like xylophones with coconut spathe as the base are also designed and marketed for about £13. Coconut sheath fibre sheets of size 5 inch x 7 inch (10 no.) are marketed for about £7.

Making artifacts from the coconut bunch waste require less skill and time compared to carving works with whole coconuts or coconut shells. Moreover the main raw materials required, i.e. the bunch wastes and leaves are abundantly available in the coconut growing parts of the country, stretching from Gujarat coast in the west end; southern States; eastern States of Odisha, Chhattisgarh, West Bengal and parts of Bihar; and to the Northeastern States, except Sikkim.

One can easily browse the internet with key words like coconut spathe handicraft, organic sculpture, coconut cap art, coconut palm frond art, coconut leaf art etc. and can get acquainted with these handicraft items. The same can be popularized among the public through the awareness programmes and skill development programmes organized by several agencies including Coconut Development Board. The SHGs and Farmers' Collectives can also encourage these art form among their catchment area to create more employment opportunities.

Industrial applications

Various experiments have been undertaken to utilize the waste of natural products into profitable and marketable raw material. In Sri Lanka the coconut spathe is processed for making coconut spathe charcoal, which finds wider applications in

Xylophone in coconut spathe

consumer goods. The coconut leaf sheath fibre with suitable treatment finds place as reinforcing fibre in polymer composites in addition to the coconut coir fibre. Natural fiber reinforced composites have gained better attention in recent years due to the exclusive properties of natural fibre like low specific weight, high specific length, high stiffness and biodegradability and eco-friendly nature. Natural fibre-composites have considerable potential to replace conventional materials like metal, plastic and wood in structural and non-structural applications, especially in furniture industry.

Coconut fronds can be used as raw material for making art paper as it has good amount of fiber and cellulose. The utilization of coconut fronds for making art paper can minimize the coconut fronds waste. Additionally, it also has an impact on forest conservation, since most of raw materials for paper pulp are coming from wood. Experiments also are being taken up on external coloring, shaping, forming, designing, and preserving coconut sheath in order to make it ideal for application on jewellery products.

Research and development works may be undertaken to widen the profitable industrial applications of these leftover parts to fulfill the manufacturing industry that needs renewable raw material. This will also help in generating faster profits and secondary income to the farmer while waiting for the coconut palm provide a regular yield.

Conclusion

Once these so called 'wastes' can be transformed into profitable 'material' and put in wider uses, the quality of the sheath, bunch remains, frond, etc. will be taken in the account by the buyers. The farmer will then be motivated to collect, clean, preserve and sell them as a product, which can marginally supplement his income.

The handicraft products made out of wastes may not sound quite appealing. But the proverb 'Beauty lies in the eyes of the beholder', that encapsulates the idea of perception.

The propaganda and market developmental activities for these kinds of products also have to be enhanced to create regular domestic and international demands, by the concerned agencies in a coordinated manner, for sustainable livelihood of the farmers and artisans. ■

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