

COIR FOR ECO-DEVELOPMENT

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History has been a mute witness to the skewed path of development process particularly over the last century, ignoring the need for attaining along with it an ecological equilibrium. This has caused serious issues like pollution, deforestation, soil erosion, rapid depletion of resources especially of non-renewable resources, slow regeneration of renewable resources, and above all the much-dreaded phenomenon of climate change. Eco-development aims at a combination of development and attainment of equilibrium with the environment for sustainability. In this context coir can make a significant contribution towards sustainable development.

The coconut palm-kalpavruksha - is known to be a rich source of raw material for a variety of products. Its nut is the most versatile of all, with its kernel and oil being widely used for edible and industrial purposes. The coconut husk is the raw material for the coir industry. Coir has been traditionally used as yarn, rope and floor coverings like mats and mattings. Apart from these now coir is finding new applications as ecofriendly substitutes. Technologies have been developed for manufacturing coir fiber composites to substitute wood and synthetics. Coir bhoovastra has been acknowledged as an effective long-term biodegradable geo-textile for several soil bioengineering applications. The coir pith hitherto considered as a problematic waste is proving to be a source of wealth from waste. The potential of these non-traditional products is now well established but they are yet to gain their due recognition. Once they achieve their rightful place it would lead to a higher utilization of the coconut husk, which at present is only about 35% of its harnessable quantity. This in turn would lead to creation of more employment opportunities particularly in the rural areas. Use of these non-conventional coir products is an alternative strategy to the present day unsustainable exploitation of precious natural resources.

The tropical forests, world over is facing serious threat of extinction, mainly on account of ignorance and non-availability of alternatives. The decline has been alarming especially in the developing countries, where the forest resources have been reduced by about 40% over the recent past. Globally the forest cover has come down to 6% from 14% and is getting depleted at the rate of an estimated 7.5 million hectares a year, despite the afforestation programmes. The uncontained deforestation causes destruction of priceless biodiversity, destruction of vegetative cover with consequent soil erosion and attendant problems besides influencing the much dreaded climate change.



The R&D efforts of the Coir Board of India were successful in developing a coir composite that can substitute wood, plywood and MDF boards. The composites are made out of a combination of two or more materials to achieve superior properties than that of its components. Here coir fiber and phenolic resoles are used to make the ply of any desired density. Based on the density the ply can replace plastic boards, MDF boards, or hard board made out of wood. The coir ply can be reinforced with plantation wood like rubber wood veneer, for better properties without destroying natural forests. They are resistant to termite and borer attacks., flame retardant, boiling water resistant, and free from fungal growth. The nail holding properties are better than MDF, because of the long staple fiber and normal carpentry tools are good enough to work with. The coir ply has been standardized under BIS (IS : 14842-2000) It has obtained necessary approvals for use in the Indian Railways, Defence, CPWD, State Road Transport undertakings, HUDCO, Rajiv Gandhi Rural Housing Corporation, State Housing agencies etc. This technology has been patented and is being used for commercial exploitation. The product is available in the market. Once it becomes

popular its contribution to save the tropical forest timber would be phenomenal. It is estimated that 40 cubic meters of coirply can save about 66 acres of forest per annum from deforestation, assuming 100 trees per acre and each tree producing 1.80 cubic meters of wood. This indeed is an alternative to destruction.

Another R&D project of the Coir Board in collaboration with The Indian Institute of Packaging, Mumbai has developed alternative to conventional wood based packaging material for various applications. Crates made out of coir composite board, for equipments like circuit breakers, lids for fiber drums, and collapsible reusable containers replacing plywood are some of the very exciting products developed under this project. They are found to be superior in quality compared to plywood, MDF board, etc and are cost effective. Tests and trials carried out with these products have been successful. It is a patented technology now available for commercial production.



Notwithstanding these achievements, the R&D efforts in the field of coir fibre composites are still in its infancy. Substantial work is yet to be done in product innovation and diversification especially to make it totally ecofriendly by using biodegradable polymers, as binding material. There are also several other exciting opportunities for coir composites as in the field of automobile components, especially for its interiors, and for products like crates, pallets, corrugated containers etc in the packaging industry, and many other household and restaurant articles like trays and plates. However it is their mechanical reliability, durability, recycleability, end of the life disposability and above all cost effectiveness are the factors that determines the preference for use of coir composites. The lack of awareness about the advantage of the product, reluctance of contractors and carpenters to use them, non-availability

of a critical mass of these products in the market are some of the obstacles on their way to getting popular with the potential customer.

Another non-conventional product from the coir industry is the Coir Bhoovastra or coir geo-textiles commonly being used in soil bio-engineering applications. One of the major ecological threats that the world faces today is soil erosion, particularly of the topsoil. The fertile, roughly 12 thick topsoil is what sustains life and civilizations on earth. About 36% of the world cropland is losing topsoil at an alarming speed, threatening the food security of several countries. The developing countries are the worst affected. It takes thousands of years to form the thin layer of surface soil but needs only a few minutes to lose it through erosion caused either by water or wind or mindless human interference. About 27% of the land surface of our country is facing threat from one or another form of erosion. If left unchecked it can convert precious cropland into barren wasteland. Deforestation is one major factor contribution to soil erosion. The most ecofriendly method of erosion control is through revegetation preferably using a natural geo-textile. The coir bhoovastra as long term biodegradable geo-textile of soil bioengineering and bioremediation applications has been well acknowledged. The coirgeotextiles are available in woven or nonwoven form as meshes, needled felt, pads, erosion control blankets, antiweed blankets, georolls etc. The permeable fabric is easy to install and follows the contours of the soil surface. It is particularly useful for uneven and rocky terrains. It can be used as an overlay for surface cover or as an interlay for separation, filtration and drainage. It protects the soil surface and promotes growth of vegetation during its formative stage. It can dissipate energy of flowing water and absorb solar radiation. The woven mesh hugging on to the surface acts like micro check dams retaining moisture for the seed to germinate and the saplings to take roots both in terrestrial and aquatic riparian habitat. The effective product life varies from one to three years, depending on the terrain weather condition, type and quality of the yarn used. In under water applications it may extend up to five years or even more. Thereafter it degrades into mulch and gets assimilated in the soil, which gives it an edge over the synthetics. Coir bhoovastra has a variety of applications as in soil stabilization, slope stabilization, water course protection, stream bank protection,

shoreline protection, storm water channelling, road pavement, road surface stabilization, fly ash dump protection, mine site reclamation, forest revegetation, water shed management, mudwall reinforcement, landscaping etc. But the sad part is that while several countries abroad have recognised its worth as proven by the increasing exports, it is yet to find its legitimate place in our own country.

A comparatively new entrant in the non-conventional product range is coir pith, which is the spongy material that binds the coconut fiber in the husk. It is a by product separated out of the husk while extracting the fiber. Its capacity to hold moisture eight times its weight makes coir pith an excellent soil conditioner. With the ban on mining of peat that is actually baby coal, the horticulture industry was in search of an alternative material from a renewable resource. It was then that Coir pith was found to be a suitable substitute for natural peat. Raw pith, especially more than two years old is being widely used in the market garden sector and commercial nurseries, mainly for hydroponic form of cultivation. The export demand for clean, raw pith, devoid of any foreign bodies, and with appropriate phytosanitary certification is on the increase, The pith can also be composed into organic manure with help of a fungus viz; *Plurotus sajor kaju*. This technology is now available with the Coir Board for commercial exploitation. Arid and semi-arid land in our own country can be converted into arable land using coir pith. But it seems, our agricultural fraternity has not taken due note of this fact so far.

With such a good potential for ecofriendly products from a renewable resource like coir one would expect things to go smooth in the context of widespread debate on sustainable development. But reality is something different. These products are still clamoring for its rightful attention from the Government and the potential consumers.

Certain proactive policy initiative are required from the Govt. by way of fiscal incentives to popularize the use of these products. The coir ply should be exempted from levy of excise duty and sales tax atleast for ten years on the ground that it saves trees, the precious forests, helps prevent soil erosion, promote afforestation, reduce green house gases, and slows down global warming. If subsidy could be given to the

use of plastics in agriculture, there is no reason why coir bhoovastra, a natural product cannot be subsidized. Similarly if dangerous chemicals can be subsidized in the name of pesticides and chemical fertilizers there is no justification in denying it to an organic manure from coir pith, duly certified by a competent authority. The Ministries of Environment and Forest and Agro & Rural Industry, Govt. of India should take necessary lead along with the Ministry of Agriculture and the State Govts. While the world is looking for answers to problems of sustainable development the coir industry is offering a win-win solution. What is now needed is a change in our mindset in favour of accepting an alternative strategy for sustainable development-Ecodevelopment.