INSIGHT Looking Beyond Traditions

Insight means to have a deep and accurate understanding of something or someone. As the word suggests, the visit to the screw pine and water hyacinth cluster, gave us an insight on how a tradition evolves, the factors influencing it and how it turned out to be product of commerce. A tradition always would have evolved through using materials that is found in an around the region. Both the crafts are strongly related to the society and the environment. Hence "Insight" tells the story of the craft seen through our eyes, what we found beyond the tradition, the changes in the life of people behind the craft, the Artisans.

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INTRODUCTION

Kerala is a state known for its culture and traditions. Also Kerala is truly a "Gods Own Country" rich in vegetation and greenery. Always Kerala is visualized to be a place with a lot of green coconut trees, thick vegetation and the backwaters. These reasons have lead to utilizing the plant fibers for making handicrafts from earlier days, many centuries ago. The Screw pine craft is a traditional craft which forms one of the important sections of the natural fiber craft of Kerala.

This craft started off due to the abundant availability of raw materials. The screw pine, during earlier days were used as fences or boundaries. The history of the craft says that the women in the households started weaving mats out of the screw pine which grew in their backyard and fences due to poverty they were facing. Only the men of the house would work and the income they got was not enough for their daily food. To help them, women started exploring with screw pine, making bedding mats and other household items so they do not have to buy from



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a market. They would save some money by doing this. The women used to do it during their free time, after their household works. As every other handicraft, this is also carried out in rural areas and mostly woven by women. Later they started taking it to the open market and selling the mats. Slowly this grew as a traditional craft in the coastal areas, regions near water bodies were screw pine used to grow abundantly.

Now this craft exists mainly in three regions of Kerala – Thazhava (in Kollam district), Kodungallor (in Thrissur District) and Thalayolaparambu (in Ernakulam District). Even though the demand for the craft is more, the number of artisans working in this craft is decreasing due to number of reasons like low wages, lack of labor, lack of availability of raw materials and so on.

The craft cluster studied here, in this document comes under the Kodungallur Screw pine cluster and water hyacinth artisans, both the craft which are supported by the Non Government organization called Kottapuram Integrated Development Society (KIDS) located at Kodungallur. KIDS is the social service center which was started by the diocese of Kottapuram. KIDS has got a number of projects which was started to support and help people to earn a sustainable income and improve their conditions. One of the major initiatives was to improve the conditions of the screw pine artisans. KIDS has got a Natural Fiber Craft Department which is exclusively for Screw pine and Water Hyacinth artisans.

Water Hyacinth is a weed that grows widely in the water bodies in Kerala. Also water hyacinth is environment hazardous and badly affects the aquatic life. As Kodungallur is a town surrounded by water bodies, one of the main occupations of this region is fishing. The water hyacinth project was started by KIDS in 2006, as this affected the livelihood of fishermen and the ecosystem. The stalk of the leaf is taken for making different products and leaves and roots are used for vermi compost and biogas production.

KIDS supports these artisans from the initial stage of production i.e. from collecting raw materials to finishing the product. The artisans have been grouped into Self Help Groups to make them self reliant and to attain a sustainable income.

The main objective of this study is to understand about the craft and how different factors have influenced in shaping the craft the way it is now.

- The influence of the geographic conditions of the region on the craft.
- The effect of different climatic conditions on the craft.
- The evolution of the craft, the changes in the life style of artisans now and then.
- The change in products from traditional to contemporary ones.
- The socio political, economic, cultural and technological influences on the craft.
- The current situation of the craft and the scope of this in the future.

This document takes you through the evolution of screw pine and water hyacinth craft, the ways travelled through, KIDS as an NGO helping the artisans, and the lack of labor and income for the artisans which is the current situation.



KODUNGALLUR

The screw pine craft center we visited was located at Kodungallur. This was a small town located 35km south to Thrissur in Kerala. Kodungallur or Cranganore was an ancient port town surrounded by backwaters and the Arabian sea. Since it was a busy port which was best suitable for trade, a lot of foreign powers have influenced the place through their visits starting with Portuguese in 15th C, followed by Dutch and British. Kodungallur has also helped in spreading the messages of different religions like Christianity, Judaism, Islam etc. This was the place were first Mosque was built known as Cheraman Masjid and first church known as St. Thomas Church. Kodungallur Bhagavathi Temple is one of the very famous temples in Kerala known for its festivities, the time when Kodungallur floods with pilgrims from all over Kerala. This temple was built by Chera King Cheran Senkuttuvan.

Kodungallur was derived from the word Kodi – Linga – Puram which means a city of crores of Shiva Lingas. Also Kuda Kons, the Chera rulers collected revenue for the goods coming to the nearby port from this place, which came to be known as Kuda – Kons – uuru(place) which later turned to Kodungallur.



KOTTAPURAM

Kottapuram as the name suggest it means Kota(Fort) and Puram (City or Town). Kottapuram forms an integral part of Kodungallur, which was famous for its busy ports and trade. Kottapuram is located at southern end of Kodungallur. The Roman Catholic Diocese of Kottapuram which was formed in 1987 is present here.

Kottapuram is known for the Kottapuram fort which was built by Portuguese in 1523. The fort has a long history of different people conquering it, rise and fall of emperors for four centuries, starting with Portuguese, then Dutch and finally Tipu Sultan. When Travancore got the fort back from Tipu Sultan and British, it was completely demolished to a few walls here and there. The Kottapuram fort is located at the mouth of river Periyar and it is about 4km on the Kodungllur – Muthakunnam Road. An important landmark of Kottapuram is the Kottapuram market, which was a center of trade and has both Kerala and foreign influences. The market shows the combination of many cultures of the tradesmen who came to Kerala for trade and other purposes. Kottapuram market was a rural market which wakes up by 3am and closes down by 3pm. There would be a lot of vendors and traders coming from faraway places, the people would purchase vegetables, household items, anything and everything from this market.

Another seaport and ancient trade center in Kodungallur was Muziris. This port has played a key role in connecting Southern India with the Romans, Egyptians, Greeks and the Persians. The commodities exported were mainly spices, precious stones, silk, pearl, antimony, lead, colored textiles etc. A great flood occurred in Periyar river in 1341, which disappeared Muziris and altered the geographic condition of the region changing the key trade centers to Kochi and other places.

KOTTAPURAM INTEGRATED DEVELOPMENT SOCIETY (KIDS), KOTTAPURAM

Kottapuram Integrated Development Society, Kottapuram is the social service center, a Non Government Organization(NGO) started by The Diocese of Kottapuram when it was separated from Archdiocese of Verapoly in 1987 under the leadership of Rev.Dr.Fr. Francis Kallarackal, the bishop of the diocese. Since the formation of the society, its main focus was on the development of the community, especially the poor and marginalized irrespective of caste, creed and religion. In the initial stages, they had a charity approach, poverty eradication and mostly worked in the villages.

KIDS OFFICE

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JYOTHIS WOMEN'S WELLINE SURF

Image 5 : Kottapuram Integrated Development Society

VISION - To establish a just and self reliant society based on human values.

MISSION - Total development of every human being, especially the poor and the deprived through empowerment where the people live a life of their own in self-reliance with human dignity and confidence and in complete harmony with nature.

KIDS, is a registered voluntary organization under the Travancore Cochin, Literary, Scientific and Charitable Societies Act of 1955. Its headquarters is at Kottapuram in Thrissur District and also operating in four revenue districts, namely Thrissur, Ernakulam, Malappuram and Palakkad.

Even though KIDS started with charity approach, slowly started aiming at the further development of the society through Community based organizations. From 2000, KIDS has been striving to improve the conditions of the people through various interventions, training classes with the expert services available to the organization.

Following are the objectives of KIDS-

- To promote, conduct, facilitate and coordinate developmental and social welfare activities for the poor and the needy irrespective of caste, creed, gender or community.
- Formation and strengthening of people's organization for community development.
- Empowerment of women and other weaker sections in order to ensure their participation in community development.
- To conserve and regenerate natural resources for the sustainable development of the humanity.
- To establish linkages and collaborations with Government bodies and other sectors for community development.

• To promote collective learning and sharing of resources, dissemination of information and technology for sustainable development.

There are 12 Departments under KIDS serving the society in different areas of improvement of people –

- Human Resource Development
- Micro Enterprises and Macro Finance
- Natural Resource Management
- Disaster Management
- Community Health
- Children Development
- Fishermen Development
- Agriculture Development
- Tribal Development
- Sayam Prabha(Department for the Elderly)
- Natural Fiber Craft
- Differentially abled Section Department

NATURAL FIBRE CRAFT

The Natural Fibre Craft Department, is the unit of KIDS which promote the craft in order to serve the artisans with sustainable income. KIDS has been working towards the integral development of the traditional artisans through promoting screw pine and water hyacinth craft by value addition.

The objectives of Natural Fiber Craft Sector

• Eco-restoration of water bodies of the area through plantation of screw pine along the banks of rivers and canals.

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INSIGHT - A LEARNING FROM TRADITION

DESIGN DEVELOPMENT WORKSHUP O SCREWPINE CRAFT FOR THE PHYSICA CHALLENGED

Supported by: RGF New Delhi Organized by: KIDS Kottapuram

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Image 6 : Design development workshop of screw pine craft organized by KIDS for physically challenged

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- Ensuring raw material security and its constant supply through large –scale planting of screw pine.
- Management of wetlands by conversion of water hyacinth into natural fibre for making ecofriendly items of general utility.
- Achievement of qualitative improvement in production through skill up gradation of artisans.
- Lifting of artisans to a level of effectively making new and value added products through design development.
- Creation of an effective marketing network for the SHG products.
- Development of a non- polluting industry using a locally available resource e.g. screw pine, water hyacinth etc.
- Provision of jobs for thousands of people without any huge infrastructure.
- Development of screw pine and water hyacinth as an alternative to many plastic products.
- Striving to achieve higher exports for the country.
- Working for the preservation of the cultural heritage of mat weaving by uplifting the declining craft.

AMBEDKAR HASTSHILP VIKAS YOJNA (AHVY)

Handicrafts constitute a major part of the unorganized sector in the Indian economy. This started in rural areas were women used to make handicrafts as their part time activity which later turned to be of great demand in market over the years. Presently the craft sector is generating employment opportunities and export but this sector has suffered and would suffer due to lack of education, low wages, poor exposure to new technologies, lack of market intelligence and poor institutional framework. Ambedkar Hastashilp Vikas Yojana was launched in 2001-2002 which aimed at integrated development of potential handicraft clusters along with the craftsmen for their improvement and sustainability.

- Social Interventions Community development by forming SHGs, issuing identity cards and health cards.
- Technological Interventions Modern tools, Design and Technical Development workshops, seminars, organizing the artisans.
- Marketing Interventions Organizing exhibitions, Setting up emporia, market assessment, Entrepreneurship Development program, Publicity through media, exposure tours for artisans for understanding the market, products etc
- Financial Interventions Wage compensation for cluster managers, avail loans for working capitals, Credit Guarantee scheme, planning scheduling and monitoring.
- Cluster specific Infrastructure Related Interventions Setting up of raw material bank, common facility center, setting up of facility centers by exporters so they could upgrade on the new facilities ,technology etc.

So under the AHVY, KIDS started organizing craftswomen into Self Help Groups.

SELF HELP GROUPS

Self-Help Group (SHG) is a small voluntary association of poor people, preferably from the same socio-economic background. They come together for the purpose of solving their common problems through self-help and mutual help. The SHG promotes small savings among its members. The savings are kept with a bank. This common fund is in the name of the SHG. Usually, the number of members in one SHG does not exceed twenty. It also enables the members to learn to cooperate and work in a group environment. The SHGs provide savings mechanism, which suits the needs of the members. It also provides a cost effective delivery mechanism for small credit to its members. The SHGs significantly contribute to the empowerment of women.

In the year 2001, SHG for women were formed by KIDS as women were recognized as the primary agent in the community development initiatives. Each SHG contains 20 members. Since 1988, women were grouped into Swasraya sangams and Mahila Mandal as a large group. Mahila Mandals is a rural women organization which contains more than 20 members where women get to discuss about social, political, personal, economic and spiritual concerns. It provides a space for women to address the issues like poverty, health etc. This helps in providing women with security and independence through empowering them. Understanding that developments should reach the grass root level, these mahila mandals were further divided into SHG by 2001.

As KIDS started serving the community, they indentified that mostly the poor people in Kodungallur were screw pine artisans. Kodungallur was a main hub for screw pine weaving in India. They have been very badly exploited by middlemen who used to give loans and the interest is paid back through weaving the mats and also there were other people who used to provide with the raw materials and make them weave the mats, sell the mats in the market and pay them less.



ດອອກໝູດຫຼື ຄວາອງຊາວອົງສອງຄຣ ກາວຊາດງ ກາງກາດກ່າສ ໄປເດັດດານເດີ Image 7 : Book published by KIDS on the problems of screw pine mat weavers in 1990



The artisans used to do this due to their poor conditions, in order to at least get their daily bread and lack of education also paved way for this. KIDS was able to identify such artisans and organized them to form a group in 1988. They started saving one rupee each from the income they got and finally they were able to save some money to buy screw pine on their own. So more women started joining the group and it was formed into a Credit Union .The lack of funds and poor condition of the artisans made them demand for a welfare fund from the government. This was led by KIDS. As the number of artisans was not significantly high, government refused to grant the fund. This led to a strike in 1990s were the women artisans came out of their homes and literally led a protest.

Following are the events that took place at that time.

- 1989 : Started working in Groups
- 1990 May 20 : Published a book on the financial problems faced by screw pine weavers.
- 1991 92 : Groups trained to become independent, to stand on its feet.
- 1993 Sept 17 : Submitted a memorandum and will to the Chief Minister.
- 1997 Apr 30 : Kodungallur Taluk Office Picketing.
- 1997 May 5 : Resubmitting the Petition to the Chief Minister
- 1999 Jul 13 -14 : Jeep Strike from Valappad to Kara (places in Thrissur District)

This took place at a time when rural women never used to come out of their homes and it was a more patriarchal society. The Demand for the welfare fund was granted in 2000. ENVIRONMENTAL EXPOSURE / INSIGHT - A LEARNING FROM TRADITION

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MILESTONES IN THE SCREW PINE AND WATER HYACINTH CRAFT SECTOR

Over the years this craft has grown into a much larger area, with the support of KIDS the artisans were able to achieve self reliance and has become an integral part of the society and its development. Following are a few achievements which made the artisans, the screw pine craft and society linked.

- Under the AHVY scheme, a number of training classes and Design workshops were given to women artisans regarding new designs, marketing etc. Women selected from different SHGs were given classes from the initial stage of processing the material to final product making. The group also included members of SHG who were not well versed with all the processes. These artisans were given inputs on each and every detail while doing the craft and easier steps if any.

- Designers from India's Best institutes like National Institute of Design(NID)Ahmedabad and Indian Institute of Craft and Design (IICD)Jaipur used to conduct the design workshops. Now the Natural Fiber Craft Sector has 200 artisans in total.

- A Sales Emporium was started in order to market the goods produced by the artisans. Initially the emporium was for showcasing the artisan's works. After sometime, a sales section was also formed. The Emporia was inaugurated by Mr. P.H. Kurian IAS, Department of Industries and Commerce, Government of Kerala.

- Training classes were given to Kumari Sanghams, a group of adolescent girls on water hyacinth and the process and making of the product. This was carried out under the ICDS (Integrated Child Development Services) program ,Government of Kerala. - Identity cards were issued to the screw pine weavers under Ministry of Textiles, Government of India. This helped to give the artisan an identity, their craft was also promoted.

- Attended exhibitions in Prime locations of the country like New Delhi, Mumbai etc, which attracted a lot of buyers for natural fiber cluster as screw pine and water hyacinth craft is only seen in Kerala.

- Inaugurated the Common Working Facility Centre for Natural Fiber Craft at Poyya, Kodungallur which would provide the artisans with a more relaxed and spacious work place were they could interact with much larger crowd from the same field they are working. This centre also includes a Dyeing and Drying unit with all facilities and an Effluent Treatment Plant which is always necessary in order to keep the environment less polluted.

- Scholarships were given to High School Children of the artisans for their academic excellence. Lack of education was a major drawback seen in the artisans which mostly leads to their exploitation. So education plays an important role in the shaping of a person's life.

- Health Cards were also distributed which helped them to avail treatment free of cost from selected hospitals.

- Exemption of Screw pine products from Sales Tax – Earlier the artisans used to pay 8% tax on screw pine products. The exemption of Tax has led to an increase in the sales and export of these products.

- The screw pine crafts of Kerala were registered under **Geographical Indication** Registry. A Geographical Indication is used for product which has a specific geographical origin and has properties due to the climatic conditions or uniqueness due to the characteristic of that place. The registration also helps in boosting the exports and economic conditions of the poor artisans.

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Image 9 : Craft Based Resource Centre for Natural Fibre Craft, Poyya

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NATURAL FIBER CRAFT RESOURCE CENTER, POYYA

The aim of the natural fiber craft resource center is the promotion of the craft so as to serve hundreds of artisans with a sustainable income. KIDS organized the women into SHGs and further into clusters. Under the Development Commission Handicraft, Ministry of Textiles, KIDS trained artisans for their development and attaining a sustainable income. In recognition of the achievements made by KIDS, they were awarded the first Natural Fibre Craft Resource Center as part of the Eleventh Five Year Plan of the country. The objectives of the Resource Center –

To create an institutional mechanism and to provide a single window solution in an identified craft for comprehensives handholding in the following aspects –

-Technical and Technological Information

- -Market intelligence
- -Enterprise Development
- -Microfinance activity

-Reporting/ Monitoring or Evaluation/ Experience share

-Product Information

-Raw material Information

Who ever is interested in knowing more about the screw pine or water hyacinth craft can visit the place, and study about it.

The Resource center consists of a Dyeing and Drying Unit, Effluent Treatment Plant, Product Making Section, A Godown to store raw materials, A Craft Museum, a Conference Hall and a small Library. KIDS serves as a platform for a group of artisans to come and work together and they are trained to do the process from raw material collection up to the effective marketing of product in a self sustainable manner. The working atmosphere is very calm and pleasant, so artisan can work creatively. The Quality, Quantity and Time are the important factors that affect the screw pine craft. Good quality goods should be produced very carefully with a lot of care and delivered in the specific time. During the time of orders from customers, they divide the work among themselves and do it .

All the raw materials collected from different centers, are brought to Poyya for Dyeing and again taken back to other places for weaving .This comes back here as finished mats and are then used for product making.

CONFERENCE HALL

The conference hall is well furnished, chairs made with cane and interior is done with soft variety screw pine which is found in thazhava.

CRAFT MUSEUM

A craft Museum was set up in the Natural Fibre Craft Resource Center in the year 2009. The museum consists of various products made of different natural fibers like screw pine , banana fiber, bamboo, cane, Kora grass, straw, jute etc. Most of the products present there are made by the artisans as part of the training classes they attended.



EFFLUENT TREATMENT PLANT (ETP)

After dyeing the effluent water need to be treated as per international criteria in order to maintain environmental safety. The water after dyeing is passed into a primary collection tank. This water is continuously agitated and made to undergo primary, secondary and tertiary treatment. This water is passed through a sand filter and charcoal filter and finally it will undergo the most sophisticated process of reverse osmosis (RO). The water after all the treatment can be used for irrigation after the periodical checking of Total Dissolved Solid (TDS). The same water, if necessary can also be used for dyeing so that water can be completely recycled.

Few of the other centers visited were the following -

VIKAS, KOTTAPURAM

VIKAS is a unit of KIDS, it has got 8 artisans working under them. They do Screw pine weaving and product making. As everyone knows weaving and product making, there is no partition in job. The workers are experts in their work and each of them have ten to twelve years of experience. All the artisans are women who live in the nearby places.

KUNJITHAI

Here they concentrate mainly on water hyacinth products. Production started in Kunjithai in 2008. Total seven workers are there having 8 -10 years of experience. 13 looms and 4 stitching machines were there in which only 3 looms and one stitching machine are being used. The artisans go for Rural employment schemes as they are not being paid well in the craft. There is a lack of interest for the artisans to work.





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Image 13 : Artisan preparing the dyed screw pine leaves for mat weaving VIKAS



SCREW PINE

PANDANUS - AROUND THE WORLD

Screw pine is a plant which comes under Pandanus genus. The word Pandan is derived from an Indonesian name of a tree called Pandan, commonly known as screw pine and comes under pandanaceae family. It is a monocot^[1] plant with 750 accepted species, it is an old native shrub adapted to tropic and sub tropic regions. The leaf arrangement of the plant is like the threading of a screw, hence the name screw pine. The leaves have thorns on the sides and midrib and are very flexible. The screw pine leaf is not water absorbent. Screw pine has the capacity to hold the soil tight and prevent the region from soil erosion. The root system is fibrous and holds the fine alluvial soil. Screw pine is mostly seen near the water bodies and marshy regions. They are dioecious^[2] plants, the flower of male tree are 2-3cm long and fragrant, surrounded by narrow, white bracts^[3] and the fruit is similar to pineapple.

There are so many pandanus species all around the world and its leaves are used for handicrafts purposes. Only the mature leaves are used for craft making so that the plant can naturally regenerate without destroying the plant completely.



Few Pandanus Varieties used for different purposes around the world

- Pandanus amarylliofolius leaves are used in southeast Asian cooking to give aroma to rice.
- Pandanus tectorius fruit is used for preparing jams and other food items in Hawaii.
- Pandanus odorifer flower is used for perfumes, incense sticks etc.
- Pandanus kaitha used for Ayurvedic medicinal preparations.
- All Pandanus leaves are used for crafts.
- In Sri Lanka Pandanus leaves are a major ingredient used in the country's cuisine, it is known as rampe in Sinhalese language.
- Kewra an extract distilled from the pandanus flower is used to flavor drinks and desserts in Indian cuisine.

PANDANUS IN INDIA

Screw pine is an evergreen tall shrub or small tree up to 6 m height, with a smooth light brown stem that is usually much branched and supported by a number of stiff aerial roots. These trees form dense and thicker in tidal forests, in the coastal area of India. The leaves are grayish green, hard and leathery. The minute flowers are unisexual and found on separate trees of the screw pine. The inflorescences of the male plant are spadices^[4] which grow in the form of densely arranged bunch of flowers. At the end of the bunches, are masses of stamen^[5] arranged in

branching spikes, each spike being enclosed in a narrow, pointed white leaf while the female flower grows in dense solitary clusters and are also enclosed in white leaves. The plants bear flowers in the month of June. From each cluster of female flowers, numerous minute fruits, oblong or spherical, yellow or orange arises which ripens in the following hot season. In Odisha, people cultivate screw pine for preparing perfumes out of its flower. Some species of screw pine have yellow flowers while some are whitish yellow in color and is called suvarna kethaki.

MYTH ABOUT KETAKI FLOWER

The flowers of Ketaki is assumed to have special significance in Indian culture. The flowers have a good fragrance and are even used for making aromatic oils and perfumes, but they are not used as offerings for Gods. The interesting mythological story in the Shiva Purana is as follows –

"At the beginning of time in Cosmos, Vishnu and Brahma approached a huge Shiva linga and set out to find its beginning and end. Vishnu advanced to seek the end and Brahma the beginning. Taking the form of a boar, Vishnu began digging downwards into the earth, while Brahma took the form of a swan and began flying upwards. However, neither could find his appointed destination. Vishnu, satisfied, came up to Shiva and bowed down to him as a swarupa of Brahman. Brahma did not give up so easily. As he was going up, he saw a ketaki flower, dear to Shiva, floating down. Ketaki told Brahma that she had been placed at the top of the Shiva linga. Brahma's ego forced him to ask the flower to bear false witness about Brahma's discovery of Shiva's beginning. When Brahma told his tale, Shiva, the all-knowing, was angered by the former's

ego. Shiva thus cursed him that no being in the three worlds will worship him. The flower of Ketaki, for bearing false witness, was cursed to be never used for the worship of Shiva."

PANDANUS IN KERALA

Screw pine is called "Thazha" in malayalam. In ancient times, people used to plant screw pine along the borders of their property so that it gives security as the long leaf has thorns on three angles. The root of the plant gives it the ability to protect banks of water bodies from erosion by enhancing the water holding capacity of the soil. The tradition of screw pine weaving has a rich history; it was once a means of living for many people regions like Karunagappally, Kodungallur in and Thalayolaparambu. The women in this region mastered the art of screw pine mat weaving. Then they started to sell the mats in the markets. Many lived their lives with the help of this craft. Also it was a tradition to buy screw pine mats for wedding and on the arrival of a newborn. In the middle Ages, Kerala sailors used the screw pine mats extensively.

Different varieties of screw pine can be seen in Kerala. One is pookaitha which is tall and having thick leaves, also known as Aanu thazha. This variety can be seen mainly in regions like Thazhava, Kodungallur, Thalayolaparambu and Alappuzha. Another variety is short and having soft leaves, known as Pennu kaitha. Third one is thorn less and one more variety which is known as biriyanikaitha, which has very good aromatic property and are added to dishes for flavor.

SCREW PINE IN KODUNGALLUR

According to the geographical condition of kodungallur, there are so many backwaters which make the place suitable for screw pine growth. Screw pine mat weaving is one of the oldest craft practiced by the women in Kerala, especially in kottappuram. The screw pine variety seen in kodungallur is the one which is tall and having thick leaves.

DESCRIPTION

The screw pine is mainly characterized by the presence of long narrow sword shaped leaves which are spirally arranged. The arrangement of the leaves gives an impression of long, pointed effects, which gives it the name screw pine. The plant has fibrous stem and long leaves. The plant grows up to a maximum height of 6 m. The mature leaves are dark green in color and grow up to 2-3 m in length and 2-3 inches in width. Leaves are thick, leathery, flexible and water repellent. Thorns are present in both the sides and midrib of the leaf. It has fibrous stem and thicker prop root. A screw-pine plant resembles the foliage of a palm tree but its leaves are soft and fibrous, protected by small, sharp thorns on both edges.

USES:

The plant is reported to be aromatic, antiseptic, aphrodisia^[6], carminative^[7], Abortifacient^[8], good for eye diseases, it strengthen the heart and liver and also improve the complexion of hair.

Ayurvedic property of kaitha:

Screw pine is used in the preparation of trriphaladi thailam.

"Triphaladi Thailam:

Triphaladi Thailam is Ayurvedic oil. It is used in the treatment of headache, hair fall, grey hairs and sinusitis. It is used for all diseases pertaining to neck, eyes, ear and throat. It is used for external application. This oil is based on Kerala Ayurvedic practice.

Ingredients:

341.33 grams of each of: Haritaki – Terminalia chebula, Vibhitaki – Terminalia bellirica, Amla – Emblica officinalis, Amrutavalli – Tinospora cordifolia, Ketaki – Pandanus tectorius, Asanaka– Pterocarpus marsupium, Bala – Sida cordifolia, Eranda – Castor – Ricinus communis, Indravalli – Citrullus colocynthis, water for decoction – 12.288 liters, boiled and reduced to 3.072 liters, Tekaraja swarsa – Juice extract / decoction of Eclipta alba, Hatha swarasa – Amla juice extract – Emblica officinalis, Taila – Sesame oil / Coconut oil. If it is made with coconut oil base, it is called Triphaladi Keratailam, Ksheera – cow milk – 1.536 liters Manufacturers – Arya Vaidya Sala – Kottakkal"



mage 20 : screw pine leaf in which sword shape nd air gaps are visible



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SCREW PINE CRAFT IN KIDS

Screw pine mat weaving is an ancient craft. KIDS brought together these weavers and formed Self Help Group's. Under AHVY scheme, in 2001 KIDS organized training classes for women. These classes were mainly focused on the screw pine craft. Through these training classes the weavers started screw pine craft. Screw pine cluster was organized in poyya panchayath. In natural fiber craft resource centre, Poyya there are 12 workers, out of which 9 workers are for product making and 3 workers are for dyeing. The artisans here have more than 10 years of experience and are skilled. Most of them working here knew Screw pine craft as they used to do it at their homes and some of them are trained artisans. Poyya centre is for dyeing and product making. The waste water from the dyeing unit is treated in effluent treatment tank..



TOOLS

Screw pine craft is mainly done manually by hands. Other than sewing machine they use some tools for the craft.

1. SPLICER - To split the leaves into small strips of widths - 0.25cm, 0.5cm, 1cm and 1.5cm. It is a piece of wood on which 3 blades are fixed at equal intervals. While splicing a leaf , four uniform strips of screw pine are cut.

2. NEEDLE – To sew the edges of the products. The screw pine is sliced into very thin strips of 0.25cm. The stitch is made through the edges with a long needle in order to finish the edges.

3. PUNCH - To fold the mat while making products into different shapes. It is basically a weight which is used to press the folding of the mat and so that it retains that shape while stitching two pieces together.

4. TRACING WHEEL - To make markings in order to fold accordingly. It is small wheel attached to a handle with multiple teeth on the wheel. The tracing wheel is run through the line which should be creased and is folded with the help of punch.

The main purpose of using these tools is that the screw pine would be stiff and rough, so there is a chance of breakage due to the stiffness. So to avoid this, it is first creased with tracing wheel and folded and pressed with the help of punch.

5. KNIFE – Knife is used to remove the thorns from the edges and midrib of the leaf. It has a sharp edge attached to a handle.

6. SCISSORS – to cut the woven mat according to different product sizes.

PROCESS

Following are the steps followed in the processing -

1. Collection of leaves

The leaves are collected from in and around Kodungallur, these are collected through SHGs. In the year 2009, when natural fibre year was celebrated, KIDS had asked the SHGs to plant screw pine samplings (four to five) and grow them and get yield out of it. This was used as a way to promote the screw pine and also ensured that there would be no shortage of raw materials. 8-9 leaves can be collected from a matured plant. The leaves are collected twice in a year.

2. Removing thorns

Thorn removing is the hardest process in screw pine mat weaving. The thorns are removed from the edges and midrib of the leaf. While removing the thorns, one third would be lost in the process. Previously coconut fibers were used for removing thorns, now they are using nylon fiber and also knife to remove thorns.

3. Rolling

The thorn removed leaves are rolled into a hexagonal shape and are dried under sunlight for one week. A circular shape would make the screw pine leaf curl up. The hexagonal shape when unrolled would be straight enough as the strip used for weaving should be straight. Each roll is called a "Madi" and its weight varies from 600g to 1.5kg. A number of leaves are rolled together, one after the other. The time required for drying depend mainly on climatic conditions. So the madi is always dried during summer and stored in the godown for using it during rainy season.



Image 26 : hexagonal rolls called "madi"





4. Slicing

After drying , the madi is opened, the leaves are weighed and are sliced into strips called "poli". The strips are taken to the dyeing unit and weighed according to the quantity to be colored. The leaves are sliced into smaller strips for better absorption of dyes as dyes remain only on the surface does not penetrate inside the screw pine.

5.Dyeing

The dyeing unit of KIDS is in Poyya. Now they are using water based basic dyes. Natural dyes like mehandi, kasthuri manjal, kadukka etc. were used but there were some drawbacks in using natural dyes. Natural dyes are safe but it is a time consuming process and the color will not be even. Color fastness is also another problem. As a result they stopped using natural dyes.

The dyeing unit in Poyya, has three dyeing vessels of capacities 5kg (two baths) and 10kg. 100 kg - 120kg is dyed in day in the unit. For dyeing 10 kg of leaves, 400 L of water and 200g (approx.) of dye is required. First step of dyeing is boiling screw pine in water in the dye bath. This is done for 30 minutes. This makes the screw pine leaves soft and opens the pores so that the color adsorption property of the leaves increases. After 30 minutes, the required amount of dye is added to it. Again it is boiled for 30 minutes. The leaves are stirred well so that the color gets evenly distributed. After boiling, the leaves are transferred to a tank and are washed well in normal cold water. These leaves are dried in sunlight. These are send to different units for weaving mats.

There are mainly 9 colors. Different dyes are mixed for getting particular colors. According to the shade of the color required, the amount of dye also varies. Dyeing gives a shining effect to



9 basic dyes: Crysodine Rhodamine Auromine Magenta Bismark brown Methyl violet Methylene blue Malechyte Green Coir blue Mixing of dyes: Crysodine - orange Rhodamine - pink Auromine + crysodine + rhodamine - red Magenta – magenta Auromine + chrysodine - yellow Bismark brown + chrysodine + auromine + methyl violet brown

Rhodamine + methylene blue – purple

Step 6 - weaving

Mats are woven in Vikas and other units of KIDS. There are 8 workers in Vikas who are well experienced with the screw pine craft. It is an up and down plain weave. The weaving is started by placing 4 warp strips. The weavers hold these strips with their legs. Alternate warps are folded in the opposite direction and a weft is placed above the not folded ones. They utilize both hands and legs for weaving and holding the mat. Again the folded strips are opened and other alternate strips are folded. Weaving progresses in the diagonal direction, not at ninety degrees with the warp. This is continued until the edge.

RAW SCREW PINE

METHYL VIOLET

BISMARK BROWN

RHODAMINE

MAJENTA

MALECHYTE GREEN

METHYLENE BLUE

AUROMINE

COIR BLUE

Image 30 : Name and color of the dyes

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The edges of the mat are locked by vilumbhu neyyal. Vilumbhu neyyal is the process of folding the warp so as to make it a weft. It locks the ends of the mat. This makes the strands closely packed so as to reduce the gaps. The quality of the weaving is understood by looking how closely the weft is placed without gaps.

Step 7 – Product making

Products are made in both Poyya and Vikas units. For making a product like tablemat, the size (13"X 19") is drawn on the big woven mat. It is cut using a scissors. Then a machine stitch is made on the outer line of the tablemat first so that the strips do not ravel while making the product. The outline drawn with the pencil is creased with a tracing wheel so that is easy to fold, it doesn't break while folding. Then the creases made are folded with the help of punch. Two such pieces are taken and first tied together with small thin strips of screw pine. The edges are finally stitched with thin strip of screw pine using a needle for the edge finishing.

For other products like coasters and boxes, a pattern is created using cardboard. The cardboard is cut according to the reqshape, is sandwiched in between two similar pieces to give the shape to the product. It is difficult cut the shape from the woven mat directly as there are chances of unraveling. After sticking the pieces together with rubber based synthetic adhesive the edges are finished.



Image 34 : Making Creases with a tracing wheel for a table mat











and and the Image 41 : Fruit Bag

PRODUCT RANGE

There are a wide range of products made of Screw pine. Cushion is 50 x 50 cm in size, they are made by using big strips mixed with the small ones. They experiment with colors, and mix with other natural fibers. For cushions they have different designs and color combinations. A set of place mats consists of six table mats and six tea coasters. They have different types of bags for different purposes. Market bag, cherry bag with zip, fabricated bag with braided weaving with zip, hexagonal shaped bag, mini bag rectangular shape, toilet bag, shopping bag, shoulder bag with flap, conference bag, vanity bag and seminar bag. File holders, Files, shoe boxes, laundry boxes etc. are available in different style like dyed and plane with natural color. Laundry baskets with rounded end and flower shaped end are also available. They also produce a lot of stationary product stands like pen stand, letter holder, magazine holder, news paper holder and flower vase, bread box, other products are pencil case, spectacle case, fruit box.

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PRODUCT	SIZE
CUSHION	40 X40 CM
FABRICATED CUSHION	40 X40 CM
TABLE MAT RECTANGULAR	48 X33 CM
TABLE MAT RECTANGULAR SINGLE SIDED	48 X33 CM
CARRYBAG	H: 26 CM
NEWS PAPER HOLDER	60 X40CM
MAGAZINE HOLDER	H: 29 CM W: 39 CM
FRUIT BOX	20 X20 CM
WATER BOTTLE CARRY CASE	9X9X42 CM
FILE HOLDER	40X26X13 CM
BREAD BOX	H: 12 CM L:32CM
CONFERENCE BAG	H :27 CM W:27CM
MINI BAG	H:26CM W:35CM
LETTER HOLDER	H:35CM W:15.5
WASTE PAPER BASKET	H:30 CM
LAUNDRY BOX ROUNDED WITH LID	H :50 CM DIA:25 CM
SHOE BOX WITH LID	35 X 26 X20
SEMINAR FILE WITH ZIP	H :24 CM L :30CM
ROUND BOX WITH LID	H :20CM DIA :S15 CM

Table 1 : Product and size





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Image 45 : Some of the Screw pine Products (Bags and Boxes)

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LIMITATIONS OF SCREW PINE:

Customization limited: Traditionally plain weave is done and it progresses diagonally. Customization with weaves would be difficult as weaving is done completely manually with both hands and legs. It would be difficult to manage the strips and needs time to master it. Colour and weave effects are used by trying out patterns using different colored strips of screw pine.

Fungal attack: Even though the screw pine is water repellent, the presence of moisture generates fungus. This is in the form of white powder. The materials like cardboard which are using for the stiffness of products absorb moisture and generate fungus. The screw pine which is not dyed gets hold of the fungus faster than the colored screw pine. Proper drying is required in order to keep it away from fungal attacks.

Temperature variations: Temperature variations affect the screw pine strips easily. It becomes stiff and breaks when the temperature is high. Similarly the raw materials are collected and stored before the rainy season as there is a chance of getting moist due to cold conditions, this effects the quality of the screw pine product.

Colour fastness: when the products are exposed to water there is a chance of color bleeding and fading.

Colour variation: Even though dyed using same, color of the matured leaves and immature leaves sometimes would not be uniform as immature leaves would absorb color faster than the matured leaves. So the final product would have slight difference in the screw pine strips used.



JAWAHARLAL MEMORIAL SOCIAL WELFARE & PUBLIC COOPERATIVE CENTRE, THALAYOLAPARAMBU

In Kerala, screw pine craft is mainly seen in Thazhava, Kodungallur and Thalayolaparambu. Out of this KIDS (Kottapuram Integrated Development Society), Kodungallur is a well organized society. To study about another society, we visited Jawaharlal Memorial Social Welfare & Public Cooperative Centre, Thalayolaparambu. This society is not as much as organized as KIDS.

Jawaharlal Memorial Social Welfare & Public Cooperation Centre is a voluntary organization registered under Charitable Societies Registration Act. The Organization has been working for the welfare and development of the weaker sections of the society. Jawaharlal Memorial Social Welfare & Public Cooperative Centre has been selected as a Nodal Agency for the implementation of the scheme for the development of screw pine mat weaving craft at Vadayar village, Thalayolaparambu panchayath. As part of this program the Jawaharlal Memorial Social Welfare & Public Cooperative Centre conducted design development workshops. The participants of the workshops were traditional screw pine artisans of the locality. The main aim of the workshops was to upgrade artisans' skill through appropriate design technology intervention.

Workers: The screw pine craft cluster of Jawaharlal Memorial Social Welfare & Public Cooperation Centre consists of 10 groups with 20 members each. Most of them are traditional weavers. Earlier, training classes were conducted occasionally. But now there are only 12 workers. The main reason for the reduction of the number of workers is low wages. Out of this almost everyone is going for Rural Employment Guarantee Scheme which ensures 100 days of job and they are paid more than what they are paid for the craft.

Technology: They have a building given by government and have got some machines.

Following are the machines in Thalayolaparambu.

Edge cutting machine : To cut the edges of mats so as to make them in the proper sizes.

Leveling machine : To avoid the curling of edges, the mats are kept under a bar which is operated by a pulley mechanism.

Dye bath : A big container with a burner under that. The temperature can b adjusted by this burner.

Splitting machine : Splitting machine is to split the screw pine leaves into strips. 6 different measures are there in this machine. So at a time 6 leaves can be splitted into 4-6 strips. Each section with different measures.

Sewing machine : To stitch the edges and to join different parts of the products.

Drilling machine

Among these machines, they are using only few machines. They don't know how to operate other machines and not even operated them. Lack of Education and knowledge effects their production.

Chemical treatment: The dyed leaves are given a coating of copper sulphate or the products are covered with Vaseline. This helps in the reduction of fungal attack.



OBSERVATIONS

Wages: Most of the artisans, of both societies have more than 10 years of experience. But the artisans of Thalayolaparambu are getting low wages as compared to that of KIDS. An artisan earns up to Rs.4000 in a cluster under KIDS. Wages plays an important role in taking up a job. Many of them are leaving the craft and engaging in other jobs.

Promotion: Like GAYA of KIDS, there is no such brand name or trademark for the products of Thalayolaparambu. The promotional activities of Thalayolaparambu is weak. The artisans have lost the interest in their work.

Coordination: The main problem of Thalayolaparambu is due to the lack of a coordinator who can co-ordinate the whole process of product making to marketing it effectively.

Technology: Even though more machines are there in Thalayolaparambu, they are not utilizing those machines. Most of them don't know how to use the machine and continue to work without it. KIDS makes use of the sewing machine, the other machines were not used as it was difficult for women to use.

Products: Product range is better in KIDS as compared to the Jawaharlal society. Fewer varieties of products are present. Even though the years of experience is similar for each of the groups, the quality is much better for the units in KIDS.











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WATER HYACINTH

Water hyacinth (Kulavaazha, Eichhornia Crassipes) belongs to the family of Pontederiaceac and genus Eichhornia. It is an aquatic herb floating freely on the surface of water bodies, which is blacklisted as a notorious aquatic weed in India and other tropical countries. Hyacinth is a very fast growing plant, which doubles in 12 days and form impenetrable mats of floating vegetation. The plants get its nutrients from the water though it's dangling roots. It can spread to cause infestation over large areas. The Plant size varies from a few inches to a meter in height. This plant is sensitive to cold and unable to survive below 6.5° C. Flowering is influenced by the temperature variations. It flowers generally in August-September. When the flowering is over the inflorescence bends down. Fruits containing many minute seeds are generated under the water. It grows in mats up to 2 meters thick and reduces the entry of sunlight and oxygen into the water. It is believed to have been introduced in India during 1890s.

Hyacinth originated in the Amazon basin and it was being introduced to many other parts of the world as an ornamental plant due to its beauty. It proliferated into many areas. The plant is suitable for the climatic conditions of tropical and sub topical regions and has become a problem. Hyacinth grows in temporary shallow ponds, wetlands, marshes, stagnant water bodies, lakes, reservoirs and rivers. The vegetation reproduction of the plant is asexual and takes place at a rapid rate under suitable conditions. These Plants can tolerate water level fluctuations and seasonal variations in flow velocity and changes in nutrient availability, pH, temperature and toxic substances. Water hyacinth growth is exuberated by nutrient rich water, particularly those rich in nitrogen, phosphorus and potassium. The herb completes its life cycle within one year, although it is perennial under favorable conditions. This water weed chokes the water bodies and creates problems for the aquatic system. Water hyacinth roots absorb pollutants, including toxic chemicals such as lead, mercury, strontium-90 and some organic compounds which are said to be carcinogenic.

DESCRIPTION

"It's beautiful, large purple flowers make it a popular ornamental plant for ponds. Its leaves are thick, waxy, rounded, and glossy and rise well above the water surface on stalks. They are broadly ovate to circular, 10-20cm in diameter, with gently incurved, often undulate sides. Leaf veins are dense, numerous, fine and longitudinal. Leaf stalks are bulbous and spongy. The stalk is erect, to 50cm long, and carries at the top a single spike of 8-15 showy flowers. The flowers have six petals, purplish blue or lavender to pinkish, the uppermost petal with a yellow, bluebordered central splotch^[9]. Its roots are purplish black and



Image 62 : The spongy petiole of water hyacinth

purplish black and feathery. It forms a shoot consisting of a branched, stoloniferous^[10] rhizome^[11], 6 cm in diameter and up to 30 cm in length, with several short internodes.^[12] Each node^[13] bears a leaf and roots. Axillary buds, which can also form stolons^[14], grow at an angle of 60 degrees from the rhizome and remain at that angle or bend upward in dense stands, or become horizontal in open stands. Plants on the edge of a mat form stolon buds while those in the middle may not. Stolons are purplish violet and extend up to 50cm or more in length and are highly variable in diameter. Leaves form as the axillary bud grows, rupturing a tubular leaf-like structure called a "prophyll." As the internodes between the first leaf and the prophyll^[15] elongates, roots are produced at the node bearing the primary leaf. Foliage leaves are formed after. Foliage leaves are petiolate with a glossy sheen, and are arranged spirally, appearing to be in a rosette^[16]. Each leaf consists of a petiole^[17], isthmus^[18] (between petiole and blade) and blade. The petiole bears a large membranous stipule [19], which forms a sheath around the next younger leaf. Petioles are spongy and measure up to 5cm in diameter and 30-50cm in length (maximum 125cm). They may be elongated, swollen in the middle and tapering towards the blade or they may form a bulbous float containing air-filled lacunate [20] tissue. As much as 50% of a single water hyacinth's biomass can be roots. Roots are adventitious^[21] and fibrous, 10-300cm in length. As many as 70 lateral roots per cm give the roots a feathery appearance. They are dark violet to bluish or pinkish violet, whitish if grown in total darkness and contain soluble pigments, including anthocyanins^[21] that may protect the root from herbivores. Flowers are borne terminally on a lavender spike on an elongated peduncle^[23] and are subtended by two bracts. The lower bract has a distinct blade. Each spike has 4-25

flowers (maximum 35) with 8-15 being the most common. The perianth^[24] tube is 1.5-1.75cm long with a green base and pale top. Tepals^[25] are ovate to oblong, thin, lilac and up to 4cm long. The posterior tepal (labellum) has a central bright yellow diamond-shaped region surrounded by a deep blue border with bright red radiating lines. When young, this labellum has a green spot. There are six stamens (sometimes 5 or 7) having curved filaments with glandular hairs. Three are small and close to the perianth tube. Anthers^[26] are violet and measure 1.4-2.2mm long. The fruit is a thin-walled capsule enclosed in a relatively thick-walled hypanthium^[27]developed from the perianth tube. Mature seeds can number 450 per capsule, are 4 x 1mm, with an oval base and tapering apex. The coat has 12-15 longitudinal ridges."

(Source: James A. Duke. 1983. Handbook of Energy Crops. Unpublished.https://hort.purdue.edu/newcrop/duke_energy/E ichornia_crassipes.html)

WATER HYACINTH AND ITS JOURNEY AROUND THE WORLD

Water hyacinth is originally from Amazon Basin in South America and spreaded to Africa, Asia, Australia etc due human activities. Due to the climatic conditions in Europe, it is not found there. It was first found in Zimbabwe in 1937. The infestation of water hyacinth in Lake Victoria in Africa was a great problem in 1990s. This spread to West Africa. In Nigeria , all the water bodies were dominated with water hyacinth. In Asia, it has mainly invaded the fresh water wet lands, especially standing water. It has been detected in Sundarbans mangrove forests of Bangladesh and also Deepor Beel, a freshwater lake

Image 63 : A Woman carries water through thick water hyacinth encroaching on the banks of Lake Victoria

of Brahmaputra river is heavily infested with this weed. Water hyacinth had caused many economic, social and environmental problems in Southern China and countries like Mexico. In California, USA, this weed had caused ecological impact in the Sacramento - San Joaquin Delta.

USES

In Kenya it has been experimentally used for organic fertilizer. But due to its high alkaline pH value, there occurs some controversy according to the effect of the fertilizer on the soil. In Kedah, Malaysia the flowers of hyacinth were used for medicating the skin of horses. In 1950s to 1970s the economy in the rural areas of China had faced a great shortage of food for animals and so they widely used this weed as animal food. After 1980s it is mainly used for feeding ducks and for the purification of polluted water. Through an anaerobic fermentation process, hyacinths can be converted into the natural gas methane which is a costly process but economical as the natural gas is depleting. Javanese in Malaysia sometimes cook and eat the green parts and inflorescence. In Africa, fresh plants are used as cushions in canoes. In India, the water hyacinth is fed to buffalos which are said to exhibit 10-15% increase in milk but the milk is more watery. Water hyacinth roots naturally absorb pollutants, including toxic chemicals like lead, mercury, and strontium 90 and some other organic compounds which are carcinogenic. Water hyacinth is rich in cellulose content that can be used as a renewable source of energy and can be used for the production of paper. In certain states of India, tribes use water hyacinth as a remedy against goiter diseases.

PROBLEMS

Water hyacinth can cause extensive environmental, social and economic problem. This weed is mainly seen in stagnant water bodies. Whenever the water flow becomes low, its growth increases. The domestic sewage and the residues of chemical fertilizers reaching the water bodies though agricultural run-off result in the enrichment of the aquatic system and thus boost the growth of this weed.

"Water hyacinth has been identified by the International Union for Conservation of Nature (IUCN) as one of the 100 most aggressive invasive species and recognized as one of the top 10 worst weeds in the world."







The spreading of this alien species is mainly due to its reproductive output. It can flower throughout the year and releases more than 3000 seeds per year. This seeds can live up to 20 years. But this seeds are not viable at all sites, they commonly colonizes through vegetative reproduction and through horizontally growing stolon. The mat cuts off the entry of light into the water and thus reduces the amount of dissolved oxygen. This affect the aquatic system and fish deaths are common in the areas which are infested by water hyacinth.

Impact on aquatic biodiversity: Water hyacinth absorbs large amount of nutrients and other elements like phosphorous, nitrogen, and oxygen from water, denying this vital things to the phytoplanktons and zooplanktons. This will suppress the growth of the native plants and negatively affect microbes and fisheries. And as a result this causes an imbalance in the aquatic microecosystem.

Oxygen depletion: The dense and large water hyacinth mats prevents the entry of oxygen from the air into the water surface or decrease the production of oxygen by the algae. Also the decomposed large amounts of this weed causes oxygen deficiency. Dissolved oxygen levels can reach dangerously low and affect the fish that are sensitive to such changes.

Effect on inland navigation: Water hyacinth mats are impossible to penetrate with country boats, which is the main navigation in the area. This is seriously effecting on the local transport.

Reduces water flow: Water hyacinth mats slows down the flow of the water bodies causing suspended particles to be precipitated leading to silting. These trapped silts make the water bodies shallow and causes the formation of small islands where more weeds and plants invade.

Water loss by evapo-transpiration: Water hyacinth cause increased loss of water though evapo-transpiration when compared to open water where the plant losses the water taken in by transpiration and water evaporates from the water bodies through evaporation.

Impact on livelihood of the fishermen: Infestation of water makes the access to fishing grounds time consuming or impossible. Physical interference with fishing nets makes fishing difficult. There are regulators at certain rivers for checking the intrusion of saline water into the inland water bodies. When the shutters of the regulators are closed, this weed gets blocked in the upstream of the regulator and when the regulator gets open, the weed enters the saline water. This weed cannot survive in the saline water. Thus they sink down and the decaying process is very slow. When the traditional fishermen use their nets, large quantities of semi decayed weed gets into them. It destroys the fishing net and abandons fishing resulting in severe poverty. In areas where fishermen are living from their trade, this can present serious socio-economic problems. Also in areas where there is much water hyacinth infestation, the water becomes still and warm and the fish disappears. In these regions crocodiles and snakes becomes more prevalent.

Breeding ground for pests and vectors: Floating mats of water hyacinth support organisms that are detrimental to human health. The ability of its fibrous, free-floating roots and semisubmerged leaves and stems to decrease water currents increases breeding habitat for the malaria causing mosquitoes. This increases the possibility of spreading water borne diseases.

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Image 66 : A launch moves through the Ashtamudi Canal, Kollam filled with water hyacinth

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Impact on agriculture: Water hyacinth has a distressing impact on agriculture, mainly on rice cultivation. Farmers face enormous problems in rainy seasons. Hyacinth slows water flow by 40 to 95%, which may cause severe flooding.

CONTROL METHODS

Water hyacinth control is absolutely essential. There are several popular control mechanisms for preventing the spread of hyacinth. The 3 main mechanisms used are biological, chemical and physical control. However, these existing methods are not sufficient for the control of the weed.

Biological control: Biological control is the use of controlling agents which are host specific natural enemies to reduce the population density of a pest. Several insects and fungi have been identified as control agents for water hyacinth. This includes a variety of weevils, moth and pathogens. The aim of any biological control is to reduce its abundance to a level where it is no longer problematic. The weevils reduce its abundance by decreasing its plant size, vegetative reproduction, flower and seed production. Several fungal pathogens can also be used for its control. As the weed infestation increases the biological control of water hyacinth is the time requirement. It needs 4–5 years and is influenced by climatic changes.

Chemical control: Another method which has been used worldwide to reduce water hyacinth populations is through the use of chemical herbicides such as Paraquat, Diquat, Glyphosate, Amitrole, 2, 4-D acid. Application can be from the ground or from the air. But the long term use of these chemicals may degrade water quality and put aquatic life at risk. Considering that hectares have been invaded by the weed, this method is not a big success. Chemical control is less expensive but least ecological friendly.

Physical control: Physical methods for controlling water hyacinth involve manual removal of the weeds or pulling through nets. Machines like weed harvesters, crusher boats, and destruction boats are very expensive, as well as unpractical for larger areas. These techniques require land-based vehicles for transporting the large quantities of water hyacinth which is removed. Manual removal of water hyacinth is suitable only for extremely small areas. In some areas there is serious health risks associated with the work due to the presence of snakes and crocodiles.

As all the control methods are not found to be effective, proper and effective utilization of the weed is highly recommended.

> mage 67 : Weevils, a beetle that eats Water Hyacinth



POSSIBLE PRACTICAL APPLICATIONS

Compost and biogas production: The possibility of converting water hyacinth to biogas has been an area of major interest for many years. The plants grow quickly and can be harvested to provide compost. Water hyacinth can also be used on the land as a green manure. After removing the plant from the water it can be left to dry for a few days and is mixed with ash, soil and some animal manure. Microbial decomposition breaks down the fats, lipids, proteins, sugars and starches. The mixture can be left in piles to compost, the warmer climate accelerate the process and produce rich pathogen free compost which can be applied directly to the soil. The compost increases soil fertility, crop yield and generally improves the quality of the soil.

Water purification: Water hyacinth has the potential to clean up various contaminated waters. It can be used to treat waste water from dairies, sugar factories, pulp and paper industries, palm oil mills etc. The plant can absorb large quantities of heavy metals from the water column and grows very well in polluted water.

Household articles: The chopped water hyacinth stalks can be used for making baskets, mats, sandals, bags, wallets, boxes, etc. The chopped stalks are dried and cleaned. The stalks are dyed with various colors and are used for the production of above mentioned products. There are artisans who work on water hyacinth in other parts of the world.

In a newspaper article in 2013, Dr. Veerababu, who based in Thoothukudi says about water hyacinth being identified as a potential plant for green fuel due to the presence of hydrocarbons in them. Instead of using cow dung and food waste for biogas, he tried using water hyacinth which became a huge success. It also said that economically it may not be viable due to the transportation cost involved.

There was another newspaper article which says about using water hyacinths for purification of water in Chinna Kalpet, Puducherry. It is a plant based on a technology called SHEFROL (Sheet Flow Root Level) which was designed by Professor S.A.Abbasi from Pondicherry University, in which water hyacinth is used to absorb nutrients, pathogens and microorganisms from water. The waste water and the domestic sewage from houses are fed to this plant. The plant consists of sand bags, sedimentation tanks and non-permeable sheet so that the waste water does not seep to the ground. The treated water is used for irrigation.




KIDS AND WATER HYACINTH

KIDS started the initiative of using water hyacinth in order to help the society in handling a menace which can affect the ecosystem of a region in 2006. The fishermen community in Kodungallur was facing a big problem due to the water hyacinths as it used to get stuck to the Chinese fishing nets and damages it. KIDS started with the making of Vermi compost and biogas and slowly started making use of the fibrous stalk of the water hyacinth to make handcrafted value added products. Chendamangalam, a small village depending on handloom for their livelihood, the craft was at dying stage. KIDS started the water hyacinth project in order to help the handloom weavers and the fishermen community as a whole. New simple looms were installed which were similar to those of handloom, and the artisans were trained to weave on those using water hyacinth.



Advantages of Using Water Hyacinth

The large availability of raw materials - Raw materials can be easily collected as water hyacinth is seen in water bodies in and around Kodungallur.

Creating a sustainable Livelihood - It's hard to control the production of water hyacinth through biological, physical or chemical methods. Using water hyacinth stalks to make products which give the artisans a livelihood and this helps in controlling the growth of the weed manually.

Rejuvenating the Environment - Presence of water hyacinth deteriorates the water, effects the aquatic life and in turn the environment. Removing the water hyacinths will help in the restoration of the water body and maintains the ecosystem. When KIDS was experimenting with the water hyacinth, at the same time Fr. Thomas Peelianickal, an environmentalist and the Director of Kuttanadu Vikasana Samithy (KVS) located at Alappuzha was also trying different methods to make use of the water hyacinth which was becoming an environmental hazard. Also they closed down the program while KIDS was successful in it. Following are the information gathered during a conversation with the father.

"Father had done some experiments with water hyacinth. It has fibre content in it. They removed the leaves and roots of the plant, treated it with sodium meta bisulphite (inorganic compound, disinfectant, antioxidant, preservative etc), the results were not good.

Process that was followed - Leaves and roots were removed, the stalk was boiled in water and dried in sun for one – one and half days. By this process green color turns to brownish white color (thazha color) and this was used in weaving bags like big

shoppers.

There were many screw pine artisans who did not have work, as screw pine plants was slowly getting cleared off from those regions. About 25 of the artisans, were trained by KVS in making water hyacinth products using weaving. They started exporting these bags to Taiwan through agents. The agents used to specify the size of the bags and the artisans used to make it. The artisans used to be paid Rs.55 for small bags (size specifications were there) and Rs.75 for bigger ones. KVS doesn't take profit from that. After sometime, the artisans started demanding for double the charge for the products like 150 instead of 75 because of the influence of some politicians. As the deal was on contract basis that was not possible and many artisans left the job. Quality of the product is important for exporting. Slowly, the quality of weaving became poor and almost 75% of the goods started getting rejected. This led to the closing down of the project as there was no support from govt or other organizations for funds They made products like niskarapaaya used by Muslims for prayer, cushions, bags were made mixing it with other materials etc. In 2006-2007, 8 years ago, artisans used to take 1-1.5 days to make a bedding mat and should be paid Rs.350 per day. This was difficult to be sold in a market with such high rates and this needs to be bleached as it can get effected by fungus very soon. The pulp of water hyacinth can be taken and products can be made by using the fibrous part.

This was used in making vermi-compost. But it didn't turn out to be a great success as the fibre part of it was difficult to get decomposed. It was used in growing mushroom,



Image 72: seperating the stalks of water hyacinth

INSIGHT - LOOKING BEYOND TRADITIONS







through which they understood that water hyacinth absorbs heavy metals like cadmium, mercury etc. It grows abundantly in water containing these. It also has a property of cleaning water bodies. .

Tests were carried out collecting water from a source were water hyacinth was growing. Results showed that the water was free of pollutants and it was portable water. There are researches going on how this can be destroyed. So instead of destroying it completely it has to be controlled. When use of chemical fertilizers increased in fields, the water bodies became polluted, the rate of multiplying of water hyacinths increased.

There were projects for cleaning the water hyacinth from water bodies of Alappuzha. But those just turned out to be money making activities. If more and more products like handicrafts are made from this in a tourist spot like Alleppy and Kuttanadu, people would naturally make use of the plant and it can be controlled."

As referred to the above details, use of chemical fertilizers has a great effect on the growth of Water Hyacinths. It grows wealthier in a paddy field than in a water body, due to the presence of chemicals and pesticides.

The stalks can be used for product making. Different ways are there for product making, like it can be directly pasted on to a cardboard or braiding them. A frame of the product can be made and can weave on that using water hyacinth.

PROCESSING

The steps for making products from the stalks of water hyacinth are as follows:

1. Collection of raw materials

Water hyacinth plants are collected from the water bodies. Usually this is collected by manual method. These are taken for making different products. The water hyacinth has got a bulb like structure at the end of the stalk which grows and elongates to form long stalks. The stalks would be 30 cm to 45cm long.

2. Cutting

The leaves and roots are removed carefully which is used for making vermi compost and biogas. The stalk is very fibrous and is used for the making of different products.

3. Drying

Almost 96% of the plant is filled with water. So as to remove the water content this stalks are dried in sunlight for one week. If not dried properly, this would led to deteriorating the quality of the product. The stalk is very spongy, due to this it has a foamy effect.

4. soaking

Before cleaning pith from the stalks, they are soaked in water. This is to reduce the brittleness of the dried stalk. When in dry condition, it has the chance to break while removing the pith. With the presence of pith, the stalk appears bulky and foamy. In order to get it into thinner sections, it is split. Removal of pith also decreases the chance of getting fungal infections.

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INSIGHT - LOOKING BEYOND TRADITIONS ENVIRONMENTAL EXPOSURE /



Image 78 water hyacinth basket (undyed, braided)



Image 81 : water hyacinth box
(directly pasted straightened stalks





ENVIRONMENTAL EXPOSURE / INSIGHT - LOOKING BEYOND TRADITIONS



5. Cleaning

When the stalks are soaked in water it becomes soft and cleaning process is easier in this stage. For cleaning the pith inside the stalk, first they are split into two. The pith is removed by scrapping using a knife. The pith is soft and is easy to scrap out. While scrapping, care should be given for not damaging the thinner stalk sections.

The Dyeing process is same for Screw pine and water hyacinth which can be referred from above pages (pg no.36)

LIMITATIONS OF WATER HYACINTH

Fungal attack: Hyacinth products are more prone to fungal infections than screw pine products. Undyed strips form fungi faster than the dyed strips. Fungi will be in the form of white powder. When the hyacinth products become wet we have to dry it properly in sunlight, otherwise the formation of fungi occur and destroy the product.

Laborious work: The collection of water hyacinth from the water bodies and the removal of pith from the stalk need well practiced and experienced persons. The pith removal can make crack in the stalk if not done with concentration and experience.

Less stalk length: The stalk lengths of the hyacinths are limited. Thus the product range for water hyacinth is limited to a few products while using directly the sheet woven in loom. For making bigger products, a frame should be made and the water hyacinth should be woven on to that.

Consumption of raw materials: As the maximum width that can be obtained in water hyacinth is less, more material is needed as compared to screw pine.

PRODUCT RANGE

Water hyacinth is a material which is very hard to work, so the time taken and size of product directly affects the cost and size of water hyacinth products. There are rectangular table mats of size 48 x 33cm. Meditation mats are available with water hyacinth as it has a foamy and soft structure. Other products are news paper holders, magazine holders, seminar files with zip and without zip and market bags. The water hyacinth products and its sizes is given below.

PRODUCT	SIZE
Table mat rectangular	48 x33
Table mat rectangular shaped	48x 33 cm
Meditation mat	50 x 80 cm
News paper holder	60 x 40 cm
Magazine holder	H 29 cm W 39cm
Letter holder	H 35 cm W 15.5 cm
Seminar file without zip	H 24 cm l 30 cm
Seminar file with zip	H 24 cm l 30cm
Market bag	H 34 cm
	and the second se

Table 2 : product and size

PROMOTIONAL ACTIVITIES OF KIDS

Gaya: In order to help the women in marketing their products, KIDS developed a marketing facility so as to provide a reasonable income and dependable market for these SHG persons. If any charitable agency is engaged in any kind of business activity, the agency loses its charitable nature, even though the profit is utilized for charity purposes. Therefore as per the law, charitable agencies should involve in such business, even for finding livelihood for poor people. In the light of this, it has been decided by the general body to start an independent limited company, where the producers are the share holders as well as workers and so it is called as "community owned company." This company by the name GAYA (means mother earth) DEVELOPMENT SOCIETIES AND PROJECT LTD has been registered under the companies' act of 1956.

This product is made from Screwn plants which plentifully grows in the river shores and wetlands of Kerala, India. Screwpine Craft is an ancient cottage industry in Kerala. This product is made by the women of the Self Help Groups (SHGs) of the Screwpine Craft Cluster facilitated by Kottapuram Integrated Development Society (KIDS), Kerala.

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WATER HYACINTH

Water hyacinth (Eichhonia crassipes: halive to South America but now is an en nental and social menace throughout the tropical and The main draw back with biological control of water hyacinth is the time required (4-5 years in tropical environments and it is influenced by extent of infestation, climate, water chemistry, etc). As the weed infestation increases and effective. Chemical control is less expensive but least ecologically friendly as the herbicide residue levels may be high and its detrimental fish are alarming.

As both biological and chemical methods for the effective control of water hyacinth are not found to be effective, proper and efficient utilization of the weed is a highly sustainable and sensible option. However this has not been efficiently developed.

Image 83 : Tags of products on which information about the craft and importance of it is written

The main objective of the company is to conduct, coordinate, support, promote and establish sustainable business units which provides livelihood to the people.

Government of India awarded an exclusive and international approved trade mark for Gaya.

Sales emporium: To achieve effective marketing for the natural fibre products of the SHGs, a sales emporium has been sanctioned at Kottapuram itself. The emporium is a great help for the rural artisans, where they can market their products in an organized manner. The people visiting sales emporium are mostly tourists, and also customers ask for products that can be used for gifting.

The tags on the product shows the detail of the material with which it is made. This helps the customer understand the need of doing the craft and importance of that in the society.

Exhibitions: Besides the sales emporium the products are marketed through exhibitions throughout India. Earlier, KIDS used to participate in exhibitions in order to promote the products made by artisans, later they started selling products.

Nowadays KIDS participate only in few fairs like Indian International Fair, Delhi and Bamboo Fest held in Kerala.

Fair trade: Fair trade is a social movement whose goal is to help producers to achieve better trading conditions and to promote sustainability. Members of the movement advocate the payment of higher prices to exporters, as well as improved social and environmental standards.

Awareness Classes - Classes are conducted in schools to promote the craft and to make people aware about the importance of this craft and screw pine.

Industree craft, **Fabindia** – KIDS has supplied goods to companies like Fabindia and Industree Craft and also exported to France.

Sargalaya – It is the Kerala Arts and Crafts Village located at Iringal, Calicut,Kerala. KIDS has a permanent store there and also participates in their exhibitions. A lot of products are sold through Sargalaya.



COMPARISON OF SCREW PINE AND WATER HYACINTH PRODUCTS

We have compared a few products made of Screw pine and water hyacinth-

PRODUCTS	SCREW PINE	WATER HYACINTH
Table Mat	Rs. 125 - 145	Rs.275 – 345
Files	Rs. 160 - 200	Rs. 350 – 380
Handbags	Rs. 375 - 490	Rs. 525
Big Shopper	Rs.460	Rs. 570

Table 3 : Comparison between product costs

Compared to screw pine products, water hyacinth products are more costly. This is due to the following reasons:

Laborious work: The processing of water hyacinth is a difficult task. It is time consuming and needs experts. The splitting and cleaning of hyacinth stalks can be done only by trained workers. The chance of breakage of the stalks is high during these stages. The collection of raw materials is also a difficult task.

Consumption of raw materials: Water hyacinth products require more raw materials. This is due to the limited length of the hyacinth stalks.

Trained workers: For all the processing steps of water hyacinth products, trained workers are required. The mat weaving is done in handlooms. For that also trained workers are needed.

Due to these reasons the cost of water hyacinth products are high. Water hyacinth products are also prone to fungal attack. Sometimes the presence of white powder anywhere in the product indicates the presence of fungus.

MARKET STUDY OF SCREW PINE PRODUCTS

We visited a few shops in Chandanthope and Kodungallur near to the screw pine units. Also we visited Sargalaya .

Chandanathope - Visited before attending the cluster.

Plastic products are much cheaper then screw pine mats.

Cost of Screw pine mats – Rs. 350 - 1500. For single layer mats the cost varies from 200 to 350. For methapaya, double layered mats cost varies from Rs 1350 - 1500.

Mats are not widely in demand.

Other products available are of materials like - Cane, Eeta, Kora Grass .

Even though there is demand, there are no artisans making products.

There is lack of raw materials also .The Raw materials and products are imported from Tamilnadu

Elderly people mostly by the mats as they know about the material, the quality and the medicinal use of screw pine. The mat is good for Rheumatic Fever and many other diseases. The methapaya can be used in hot and cold conditions.

Sargalaya, Iringal, Calicut - Before visiting the cluster

The cost of bags ranges from Rs.100 - Rs.250

The cost of hyacinth products ranges from Rs.50-Rs.150

More screw pine products are sold than water hyacinth products. Kodungallur

The Cost of plastic mats is Rs.120 and above.

The mats are in demand during Jan – Feb and Kumba bharani season.







The cost of of screw pine mats(thazha paya)varies from Rs.220 -Rs.400(single layered)

Double layer mats are not available

ANALYSIS

Mostly Elderly people buy these screw pine mats. Even though there is a demand in these products, there is lack of labor as they are paid less. The cost of methapaya is very high. The younger generation does not know the material, the importance of the craft and the advantages of using screw pine mats. Now there are raw materials and mats imported from other states like Tamilnadu and are sold at cheaper rate than the locally available.Plastic mats has been a great competition to the screw pine mats they are available at low cost.

Screwpine and water hyacinth products are also sold seasonally in places like Sargalaya, fairs and exhibitions take place during festivals like onam, vishu, christamas etc.

In Kodungallur, mats are sold mostly during January-February as it is time when temple festivities happen. Similarly during Kumba bharani , there is great flow of pilgrims and more demand for mats. Other products are not available in the local market.

PROBLEMS FACED BY SCREW PINE AND WATER HYACINTH CRAFT ARTISANS

Time required in mastering the craft: The mat weaving process is time consuming and it is difficult to complete one mat in a day. Well experienced weavers take 1-2 days for one mat. The speed can be achieved only by practice. Practice only comes through experience. All the artisans are very skilled and trained well they could make anything and everything with their craft inputs. **Ergonomics**: Traditional method of mat weaving includes the use of both hands and legs. New weavers are also following the same traditional method. The sitting position may cause health problems. They have to sit on the floor for a long time, until the weaving is over. This induces back pain in the body. There should be some methodology to clamp the strips together and carry out weaving so they could stop in between take some rest and carry on with that.

Low wages: Although they have to work for 1-2 days for weaving one mat, they are getting very less wages. Making of a product includes so many steps. The cost gets divided between the raw material collectors, the artisans working on dyeing it, and finally the weavers and product making section. So finally the amount that each artisan gets is less. An artisan gets Rs.150 for making the tablemat (Rs.50 for each mat). They make maximum of three finished tablemats a day while she is paid more in National Rural Employment Guarantee Scheme. So people prefer going for that job than this.. This is affecting the number of labours. Eventhough the income is less they work in this craft due to their personal likings towards the craft, they could relax and work under a roof, does not have to work in the sun and also they could meet a lot of people and interact with them.

Lack of Education – The artisans were not well educated , hence people used to exploit them in the earlier days. Due to this, they have faced a lot of problems. The artisans did not have a proper shelter, not even enough food to survive on. Financially they were backward. Even though now the situation is better, the maximum education they have is $10^{\rm th}$ class. They are artisans not even educated till $10^{\rm th}$. class. They are artisans not even educated till $10^{\rm th}$.

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Image 90 : Woman artisan splicing the screw pine strips

Lacks of Labour - As the new generation is interested more in white collar jobs and are well educated, they tend to take up better jobs. Also due less income, the existing artisans are going for better jobs with better pay.

FUTURE OF THIS CRAFT

Even though there is lack of labor and low wages, the demand for the products made of the screw pine and water hyacinth craft is high. There is a market but due the low wages the people coming into this craft has decreased. These fibres can be mixed with other fibres like bamboo etc, this helps to reduce the limitations of screw pine and water hyacinth. In order to compete with the future market, the artisans should be aware of the new trends in lifestyles, color trends etc. They should be properly guided and given expert trainings. The Product range they have is being followed for more than 10 years. More explorations should be carried out in the field of dyeing and product making. Different properties of the plant should be explored like the medicinal properties the screw pine. These properties can be incorporated into the products which are made.

CONCLUSION

The 3 weeks of Environmental Exposure has been an interesting journey throughout. Learning about a traditional craft is always interesting as it tells us about a lot of stories that happened in the past. The documentation has helped us in understanding the past, present and future of the craft and the different factors which influenced the craft. KIDS, the NGO we visited, had a lot of programmes in which Natural Fibre craft was an important one. In a society that always is curious to know about new things, there is always a demand for creative works. The main problems faced by the artisan community are low wages and lack of labour. Still the demand for such ecofriendly products would be there. The reality is always different from different unless we go deep into the scenario. New generation is not coming forward for this craft. The craft needs technological support and it will help in increasing the number of artisans

GLOSSARY

- [1]Monocot: group includes the grasses, lilies, orchids and palms
- [2]**Dioeciously** plants with male and female parts that are produced on different plants
- [3] **Bract** leaf like structure from the axil out of which a stalk of a flower arises
- [4] Spadice –a fleshy spike with reduced flowers
- [5] **Stamen** –the structure in a flower that produces pollen, typically consisting of an anther and a filament
- [6] Aphrodisiac : a food, drink, or other thing that stimulates sexual desire
- [7]**Carminative**: a drug causing expulsion of gas from the stomach or bowel

[8]Abortifacient

- a drug or device used to cause abortion
- [9] Splotch : irregular shaped spot or stain
- [10] Stoloniferous : producing stolons
- [11] **Rhizome** : a horizontal, underground stem of some plants that sends out roots and shoots from its nodes

[12]internode:

- a part or space between two nodes, knots, or joints, as the portion of a plant stem between two nodes.
- [13] Nodes : a knot, knob or swelling

- [14] **Stolon** : a shoot that grows along the ground and produces roots at its nodes
- [15]**Prophyll** : frequently specialised or reduced leaf produced at the first node of a new shoot
- [16] **Rosette**: a plant growth form in which the plant grows outward in all directions for a short distance, producing a small round shape
- [17] **Petiole** : stalk of a leaf, attaching the blade to the stem
- [18] **Isthmus** : narrow part connecting two larger structures

[19]Stipule

- one of a pair of lateral appendages, often leaflike, at the base of a leafpetiole in many plants.
- [20] Lacunate : An unfilled space or interval; a gap
- [21] Adventitious : developing from an unusual place
- [22] Anthocyanin : any of a class of watersoluble pigments that give flowers the colorsrangin g from red to blue.
- [23]Peduncle: axis of an inflorescence
- [24]Perianth : the sterile parts of a flower
- [25] Tepal : one of the component parts of the perianth
- [26] Anther : the pollen bearing part of stamen of a flower
- [27] **Hypanthium** : the bowl shaped part of a flower on which the sepals, petals, and stamens are borne

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