

Aim-Production Economics of Mat-Sedges (*Cyperus tegetum* Roxb) Cultivation in Maharashtra for Rural Women Empowerment

Sutar Kanchan

Department of Botany, S. M. Dr. Bapuji Salunkhe college, Miraj-416410 (M. S.) India

Abstract: Maharashtra agriculture economy is most widely recognized, but unknown from *Cyperus tegetum*. *Cyperus tegetum* Roxb is of ethanobotanical and economic importance. *Cyperus tegetum* belongs to family Cyperaceae is the third largest family in the monocotyledons. *Cyperus tegetum* has economic significance and the plant can thrive a wide range of agroclimatic conditions and occur in marshy situations especially in eastern and southern part of India. Their importance is at the regional or local level and the family plays a vital role in many local economics. Moreover, its cultivation is remunerative with the least investment with contrast to the cultivation of other crop like paddy, wheat, etc. During the present study author has studied the agronomy, ecology and economy of this *Cyperus tegetum* plant by visiting the farms where it is cultivated, primarily in the Herle village of Kolhapur district, Maharashtra. And keeps the updates of cultivation process and studied plant dependant sources of economy by visiting of manufacturing handcraft centre. The main aim of this study is to, aware about the economic plant that can be the source of Women Empowerment.

Keywords: *Cyperus tegetum*, agronomy, handicraft, economy, SHGs, women empowerment

1. Introduction

Cyperus tegetum (Roxb) / *Cyperus pangorei* (Rottb) belongs to the family Cyperaceae.

Abundantly found in marshy areas (Walt, 1889). It is widely distributed species without any threats. The plant can thrive a wide range of agroclimatic conditions. It is monocot, perennial herb grows in wet places, marshes, river banks, streambeds, often found in standing water and also in rice fields (Cook, 1996). It is recorded from the Indian subcontinent specially is eastern and southern part of India. It is being widely cultivated mostly a mono-crop with poor management practices by the poor marginal farmers with which resulted poor results (K. Jana, 2015). *Cyperus tegetum* also called Madur Kathi or sticks. These sticks are the source of weaving the mats so the *Cyperus tegetum* are the mat sedges provides a gainful employment to the rural economy supplements the low income of farmers and support their livelihood (K. Jana, 2015). *Cyperus tegetum* is not only source for mat sedges and other handcrafts but it also has the medicinal importance. *Cyperus tegetum* is beneficial to agronomy, ecology, economy and medicinal and ethanobotanical.

In Maharashtra *Cyperus tegetum* primarily reported in Aurwad, Bastwad, Kurundwad, Kolhapur (Yadav and Sardesai, 2002) but it is firstly cultivated in Herale, dist. Kolhapur (Maharashtra) in year May2002. This cultivated Mat Sedge are used for weaving the mat and making handcrafts, under the Self-Help Group (SHG) to Empower Women.

In this presented paper it is studied about the morphology and agronomy of plant and visited to weaving workshop at 'Samdoli' dist. Sangli, to collect the information about the weaving machines and the weaving products from the weaver women those are the members of SHG and also obtain information by the Chairman, Charak Swasthya

Bahuuddeshiya Sanstha, Sangli, about the policies of Indian government for production, exhibition and selling who offers the opportunities to women to develop the skill for success and empower them socially and economically.

2. Material and Methods

Study Area

Herle is a village in Hatkalangale taluka in district of Kolhapur, Maharashtra Hele lies in 16°41'60" Latitude and 74 ° 31'59'88" longitude. It lies in north east area of Kolhapur. Out of 1619 hectares of the geographical area of Herle, 1367 hectares of area is under cultivation. About 98 hectares are westlands. In Hatkalangale taluka, sugarcane, groundnut, wheat are the regular cultivated crops. Importantly sugarcane grows on large scale due to abundant water from the nearest river Panchganga.

Methodology

The present study was visit and observation of the soil texture and type of soil, fertility of soil due to abundant use of water and continuously cultivation of same cash crop sugarcane, soil loses its fertility and turns into westland. Farmers used an idea from West Bengal to cultivate *Cyperus tegetum* (Madhur Kathi) on practical base. In present paper plantation, growth and yield harvesting details are observed and recorded.

3. Result and Discussion

Habitat and ecology-It is a perennial monocot herb growing in wet places, marshes, river banks, streambeds, often found in standing water and in rice fields. (Cook, 1996)

Habit-Stout, tall perennials rhizome creeping, thick clothed with fibrous scaly leaves, clumps 90-120cm in height, 3 angled woody, base pinkish, sheath brownish, compound umbel (India Biodiversity Portal). *Cyperus tegetum* is a widely distributed without any threats, hence assessed as

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least concern. No conservation action is needed for this species (IUCN and ZOO, 2011)

Medicinal properties of *Cyperus tegetum*-The methanol extract of rhizome of *Cyperus tegetum* possesses a significant antioxidant, antibiotic activity (Nitaichand, 2010), antidiabetic property (Nitaichand, 2014)

Cyperus tegetum acts against different pharmacological activity namely inflammatory, analgesic as well as, a probable product to reduce skin cancer risk (Atanu Chatterjee et al, 2002)

Cyperus tegetum have traditional uses of their ethanopharmacological knowledges *Cyperus tegetum* is mentioned for its activity against Cachexia, emaciation, atrophy and snakebite (Jain and Tarafder, 1970; Tatiya et al, 2017; Chaulya et al, 2010).

Rhizomes have aromatic property which is used in perfumery. It is also used in dyes and in medicines (Jana and Puste, 2012). Mainly it is commercially useful to make several craft products.

Agronomy of *Cyperus tegetum*-*Cyperus tegetum* being widely cultivated mostly as a mono-crop with poor management practices. It is capable to tolerate extremities such as prolonged submergence in water and extended drought conditions. In agronomy application of irrigated water according to physiological growth stages of crop, particularly during the drier months for their growth and productivity. It can also grow in clay loam soil. Annually three cuttings viz at the end of Kharif, winter and summer seasons respectively. Once after the rhizomes are sown the sticks can be reaped for a period of 3-4 years. The reeds cut just above the ground leaving a tiny part of it for its growth.

Application of manures and fertilizers for growth, specific application of irrigation during drier months of the year improved growth and productivity of matsedges/reeds. (Jan and Puste, 2012). Best quality sticks/reeds reaped during Sept. to Nov. season. Considering yield performance, production economy and water economy, it may be conducted that rice straw mulching is considering for small and marginal farmers (Madur-<https://naturallybengal.com>)

In present study, the studied farm (Herle) has granular reddish soil type, soil is somewhat unfertilised due to over irrigation. Cultivator imported the rhizomes from West Bengal and sown it at an experimental level.

- 1) Sown the rhizomes on 18/19 May 2022 and reaped on 20th September, the first product reeds irrigate the water after 15-20 days intervals and gained product is three tonnes of green reeds per ten *guntha*.
- 2) September to January, 2023 reaped the sticks/reeds and water is irrigated 10-15 days intervals, 3 ½ tonnes green reeds per ten *guntha*.
- 3) January to 1st June 2023 reaped. Here March, April and May are hot climate condition. Cultivator does not use mulching and also water scarcity is felt, water irrigated after 20 days intervals and hence the gain product is 2 ½ tonnes green reeds (shorten length) per ten *guntha*.

For the production and growth urea, DAP, NPK fertilizers are used as well as Endosalphan, 2-4-D insecticides and pesticides are also applied.

In present study the cultivated *Cyperus tegetum* sticks are cultivated are utilised for manufacturing different types of mat and handicrafts through (Charak Sanstha, Samdoli, Dist. Sangli) group under the SHG for women empowerment.

Processing of sticks/reeds-

From each of the stalks 4 to 6 strips can be prepared by discarding the soft inner tissues. The strips are further processed, dry it for 4-5 hours in 3-4 days and make the bundles and store it. At the time of use the strips are further processed by soaking water to make it soft also processed by sizing and then reeds are used for weaving purpose.

In the present project reed dyeing process is not applied that's why strips have their natural colour. Plain white mat with or without coloured bordered made from culm of *Cyperus tegetum* is known as Calcutta mat in foreign market and earn foreign money (K. Jana et al 2015) Culm surfaces are impregnated with waxes that are produced by the epidermal cells. Culm/sticks waxes acts as a protective barrier against water, UV, pathogens and insects that could protect plants from environment (Bargel et al, 2006). The enormous number of waxes as crystals on the surface culms may have a role in giving the silky texture of mats. Further the abundance and chemical diversity of waxes in *Cyperus tegetum* may be exploited as an attractive source for important commercial application (J. F. Benazir et al, 2012). In hot humid climated sedge mats are very comfortable because of their heat non conducting properties and ability to absorb sweat (K. Jana, 2015). Charak Sanstha, Samdoli unit besides making folding mats (Yoga mat, Namaj mat, Table mat, Bhojan mat) also makes value added products from mat-sedges like window and door curtain, bags, folders, money purses, flower vas, tea coaster, wall hangings, boxes, etc.

Weaving Process

The setting process includes setting up Charkha (spinning wheel) and winding thread in bobbin, development of colour combination and patterns, setting up bobbin in forms, setting up drum. Actually, weaving activity begins when the soft reeds and cotton threads are arranged on a bamboo frame/loom while the transverse weft (reed) is drawn through and inserted over and under the warp (thread). Warp and weft are two basic components used in weaving. The weaving process is continuing with the help of particular technique i. e., foot operated four levers and hand operated shaft simultaneously. The weaving loom is operated by single person. A length of mat is produced which is then tailored according to the size of the product. The edges of the mat under preparation are cut and the borders are stitched with coloured cotton cloth.

From weaving product women make varieties of handicrafts. Women were trained in four months to develop skill and capacity for production of mat and handicrafts by W. Bengal trainer through Charak Sanstha group. The SHG (Self Help Group) display their exhibitions and sell in other districts and states. Also export their handicraft products through

Charak Sanstha group. The women gain profitable earning from the employment. The initiation of self-help group could be seen since 1975 the NABARD formerly started this concept in 1986-87. The main reason behind that formation of SHGs is to make available the institutional credit facility to the needy and poor women of the SHGs. SHGs help women earn their livelihood through training. SHGs provide empowerment and support the nation in carrying out the gender equality (Dr. Venkat et al, 2021)

4. Research Methodology

The present study is based on observation of cultivated field. The data was collected from SHG women by taking interview with the question answer method to understand the weaving process from them. Also, interviewed Chairman of Charak Sanstha to give more information about the government schemes for women empowerment. Writing data was collected from the publications of various governmental agencies, books, journals, internet, etc.

5. Recommendations

- Due to SHGs women empowered personal level.
- Women improved living conditions and habit of saving.
- Women awareness about their rights and responsibilities.

- Women secured about generation of assured income source.
- Women developed skill, increase in self-confidence and decision-making ability and also improved status of family.

6. Conclusion

Good quality land is more suitable for any growing of economic crops but the poor quality lands are kept vacant for a greater part of the year considering a large number of agro-economic factors.

Moreover, *Cyperus tegetum* cultivation is remunerative with the least investment in contrast to the cultivation of other crops. *Cyperus tegetum* crop contributes significantly by generating more employment, opportunities for women empowerment.

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