

Water Hyacinth : Promoting Rural Entrepreneurship With Special Reference to Assam

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Abstract

Water Hyacinth also known as 'pani-meteka' in Assam is a free-floating aquatic plant with broad, thick, glossy, and ovate leaves which may rise above the surface of water as much as 1 meter in height. It is one of the most productive plants on Earth as it yields more than 200 tons of dry matter per hectare per year. This aquatic plant is grown in abundance in the rivers and lakes of Assam. Earlier it was considered nothing but waste. Now people have realized its eco-friendly benefits that would promote rural entrepreneurship. The main objective of this paper was to highlight how Water Hyacinth can help in promoting rural entrepreneurship. The study was based on data from secondary sources.

Keywords : Aquatic plant, eco-friendly, rural entrepreneurship, water hyacinth

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It was 1997 when the revolutionary word *Biotechnology* was used by Juan Enriquez and Rodrigo Martinez for the first time in genomics seminar and it paved a new way of thinking about sustainable development. It became popular when EU and OCED took initiatives to promote the use of biotechnology to develop new products and markets. Assam, a North Eastern state of India is one of the richest biodiversity spots of the world that has the potential using this technology for sustainable development as well as livelihood enhancement of poor people of the state.

There is a widely pronounced statement regarding India that India is still in villages. According to the 2011 Census, nearly 70% of the Indian population still resides in rural areas. So, we cannot think of a developed India without considering the development of rural India. Accordingly, the Government of India has taken various initiatives to uplift the rural economy of India. However, there must be some individuals in rural areas who can help in realizing the efforts of the government to uplift the rural society. This gave birth to the need of rural entrepreneurs. Thus, rural entrepreneurs are those whose roots are in rural areas but they have a lot of potential to drive various endeavors in business, industry, agriculture, etc. Rural entrepreneurship can be developed in both agricultural as well as non-agricultural sectors. Non-agricultural sector includes various activities like handicraft, small-scale manufacturing, repairs, transport etc.

In Assam, which is a state in North-Eastern India, a significant majority is involved in handicrafts for livelihood. Assam is known for its bamboo and cane products throughout the world. Bamboo and cane works are the most popular among other handicrafts because of their local availability. However, bamboo and cane industry faces certain drawbacks that hamper its growth in the state. All species of bamboo cannot be used for handicraft and their irregular supply causes impediment to the development of this sector. On the other hand, artisans have to purchase raw material

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of cane from unauthorized traders who charge exorbitant prices which severely affect the artisan's income. Thus, a need was felt to find an alternative to cane and bamboo to promote the handicraft sector in the state.

An alternative raw material known as Water Hyacinth was found. Water Hyacinth, also known as '*pani-meteka*' in Assam, is a free-floating aquatic plant with broad, thick, glossy, and ovate leaves which may rise above the surface of the water as much as 1 meter in height. This aquatic plant is native to tropical and sub-tropical South America (Bhattacharjee, Hazarika, & Bordoloi, 2015). It is considered as a weed for clogging up water bodies and creating problems for other aquatic lives such as fish and other plants. However, Water Hyacinth has many alternative uses which pave the way for converting this weed into a useful resource. For many years, this plant has been removed from water bodies like waste material. However, recently it has been alternatively used as a raw material for various purposes. Some of the uses of Water Hyacinth plant are as follows:

- ↳ Water Hyacinth is used as animal feed as it contains proteins and minerals which are very beneficial for animals.
- ↳ Water Hyacinth is an excellent source of biogas because of its high content of hydrocarbon. It may be used to produce biogas with minimum environment pollution.
- ↳ The most recent and important use of Water hyacinth is the making of various craft products which have commercial implication.
- ↳ Water Hyacinth is also used to make fiber boards, paper, yarn, and rope.

It is considered one of the most productive plants on Earth as it yields more than 200 tons of dry matter per hectare per year under normal conditions and upto 657 tons of dry matter per hectare on water containing high concentration of sewage (Government of Assam, n. a.).

This aquatic plant is grown in abundance in the rivers and lakes of Assam. Since recent times it was considered nothing but waste. However, now the concept of 'waste management' has motivated the society to rethink about losing the waste. There have been efforts to convert the waste into wealth and pave the way for sustainable development. Likewise, in Assam, efforts were made to convert these water-weeds into useful resources. Keeping in view the potential usefulness of water weed, the North Eastern Development Finance Corporation Ltd. (NEDFi, n.a.) started an initiative to promote Water Hyacinth craft in 2008 which was later jointly undertaken by North Eastern Council (NEC) and Ministry of Development of North East Region (DONER) in the year 2010-11 to make eco-friendly handicraft products from Water Hyacinth.

Review of Literature

Keawmanee (2015) conducted a study on the potential alternative uses of Water Hyacinth in Thailand. In the study, among other potential uses, the researcher also highlighted how this weed plant has been a source of income for thousands of rural people in Thailand. The researcher stated that there were more than 50 handicraft groups that had members ranging from 20 to more than 600 which solely focused on Water Hyacinth products. The researcher made special reference to a particular Water Hyacinth handicraft group under the brand name *Ban-Aoy* which was formed in 1987 in a village of Thailand.

Bhattacharjee et al. (2015) conducted a research on empowerment of women through Water Hyacinth in the Darrang district of Assam, India. The researchers highlighted how Water Hyacinth could boost up the handicraft sector by creating employment avenues and also fetch good foreign exchange. For the purpose of the study, two localities of the district were purposively selected on the basis of training, demonstration, and exhibition conducted by Krishi Vigyan Kendra for the year 2011 to 2014. The study concluded that Water Hyacinth enterprise was growing as an important income generating activity for rural women in the Darrang district with emerging small entrepreneurs in this field.

Rakotoarisoa, Waeber, Richter, and Mantilla-Jasmin (2015) investigated whether Water Hyacinth provided economic opportunities for the Alaotra wetlands of Madagascar. The study was conducted by collecting data from the local inhabitants of the Lake Alaotra region. The researcher concluded that the livelihood of the locals could benefit from using Water Hyacinth but only to some degree. The most feasible uses were green manure, animal fodder, handicrafts, and mineral fertilizer.

Significance of the Study

Assam is known for its cane and bamboo work in the world. A majority of the state's population is earning its livelihood from handicraft. Among the various crafts, cane, and bamboo work are the most important crafts as they are readily available and their products are eco-friendly. However, not all species of bamboo are suitable for handicraft and artisans find difficulty in purchasing raw material of cane as unauthorized traders charge very high prices from them, which severely affects their income. So, as an alternative to cane and bamboo, Water Hyacinth can be used as a useful raw material for handicraft. Water hyacinth, locally known as *pani-meteka* is an aquatic plant which is widely found in the water bodies of the state. The rationale behind this study is to highlight the ways in which Water Hyacinth can be used as a raw material for handicraft work, generate sustainable livelihood in the state, and maintain a balanced eco-system.

Objectives of the Study

The objective of the study was to present the case of Water Hyacinth craft in promoting rural entrepreneurship in the state.

Research Methodology

The research is descriptive in nature. A sincere attempt has been made to describe the present scenario of contribution of Water Hyacinth to livelihood development. The data required for the purpose of this study was collected from secondary sources such as journals and the internet.

Moreover, a telephonic interview was conducted with 10 artisans from Darrang district, Assam who participated in a workshop on Water Hyacinth handicraft organized by NEDFi in the year 2012 to serve the purpose of the study.

Present Scenario of Water hyacinth Craft in Promoting Rural Entrepreneurship in Assam

One of the acute and ongoing economic problems of India is unemployment. Many measures have been taken by successive governments to solve this problem. However, in a country like India, which is the second highest populated country in the world, it is really difficult to bring a permanent solution to the unemployment problem. Moreover, India is a young country which has the highest young population. Everyone is in search of jobs. In such a situation, it becomes next to impossible for the youth of rural areas to find jobs in cities. So, the only solution is the promotion and development of entrepreneurs in rural areas. Even though there are various shortcomings in rural areas, it is necessary to assess the strength and opportunities available in rural areas and exploit them in the best possible way. This concept will give rise to rural entrepreneurship.

In Assam, majority of the population lives in rural areas. Due to lack of job opportunities they migrate to the only city of the state, Guwahati, and the nearby small towns. This makes the scenario more problematic for everyone to find jobs in a single city or in small towns. Thus, for a state like Assam which has slower economic growth as compared to other states of India, entrepreneurship development is the key to alleviate the unemployment problem. Moreover, it is more important to develop rural areas by promoting rural entrepreneurship in the state which will enable the youth of the state to have faith in the potential opportunities of rural areas. Since majority of the population is dependent on agriculture for livelihood, agripreneurship is popular in the region. However, Assam is also known for its soulful handicraft. Assam handicrafts and its various art forms are the life and soul of its people. There is a huge export market for Assam handicraft in the world. Most of these crafts are exported to countries like Japan, Malaysia, Singapore, and Thailand. Among the other crafts, cane and bamboo works of Assam are popular throughout the world. However, cane and bamboo industry faces some hurdles which adversely affect the income of the artisans. Extensive use of cane and bamboo has nearly exhausted the forests posing a threat to the traditional cane and bamboo sector of the region.

Irregular supply of cane and high cost of procurement have adversely affected craftsmen in their cane based activities. Thereby, there was a need to explore an alternative to cane and bamboo. Finally, in 2008, NEDFi started an initiative using Water Hyacinth as a raw material for making handicraft products. This was later undertaken jointly by NED North Eastern Council (NEC), and Ministry of DoNER (Ministry of Development of North Eastern Region).

Water Hyacinth Craft in Assam

Water hyacinth or '*pani-meteka*', is found in abundance in the water bodies of Assam. It was considered a problem plant that degrades the quality of the water. It also creates difficulties for other aquatic plants and diversity of fish is affected. It was a complete nuisance until its usefulness was discovered. The stems of the Water Hyacinth can be used as raw material for many kinds of craft works like :

- ↪ Mats
- ↪ Purses
- ↪ Shopping bags
- ↪ Laundry bags
- ↪ Hand bags
- ↪ File bags etc.

Process of Making Water Hyacinth Handicraft

(1) Collecting the plant : The first step is to collect Water Hyacinth from the water bodies and then separate the leaves from its stems. The stems are the usable parts which are further processed.

(2) Drying the stems : The stems are naturally dried in sunlight for five to seven days to reduce the moisture content until these can be used to make crafts.

(3) Flattening : The well dried stems are then flattened using bamboo and hammer stone for smoothening the rough edges. Flattening machines have also been introduced which help in reducing the processing time.

(4) Knitting : The smoothened dried stems are then knitted into the desired designs. The Water Hyacinth stems are tough, yet flexible which makes it possible to make various items such as bags, lamps, buckets, furniture, boxes, flower vases etc.

(5) Finishing : The product is then made eye-catching by coating it with varnish and decorating it with colourful paint, beads, silk, cotton, yarn etc. The final product is then labeled and is ready for sale.

The artisans use the Water Hyacinth raw material that grows in ponds, lakes, and rivers. Water Hyacinth can be used

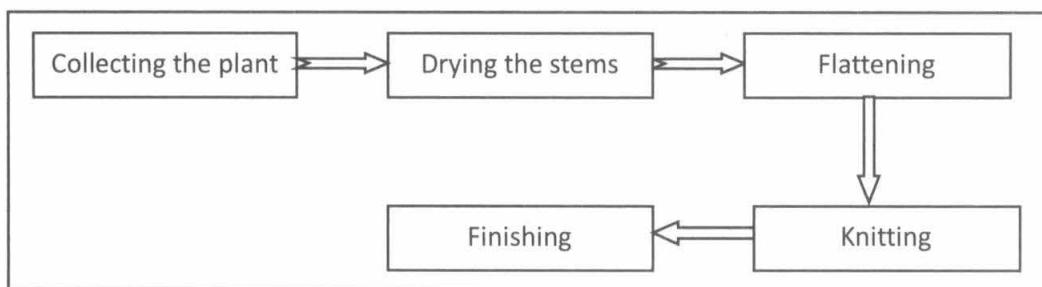


Figure 1. Steps of Processing Water Hyacinth

s a viable alternative to cane and bamboo craft works. Water Hyacinth handicraft has huge potential in promoting rural entrepreneurship in the state as it is found in abundance in water bodies which makes the cost of raw material almost zero. Artisans having experience in braiding and weaving can easily pick up the craft work, and with training at the ground level, local people of rural areas can be benefitted. There is huge demand for Water Hyacinth crafts in international markets also. Already, it is exported to nearby countries such as Nepal, Bhutan etc. Moreover, since Water Hyacinth products are eco-friendly, there will be a growing demand for it in the future as the concern for sustainable economy is growing among people. According to Rajbongshi, B., the products made from Water Hyacinth can last for three to five years if they are varnished well (Personal communication, Nov 22, 2019).

Initiatives of Different Institutions

Many projects and workshops are being undertaken by institutions like NEDFi, Indian Institute of Entrepreneurship (IIE), Guwahati, and Rashtriya Gramin Vikash Nidhi (RGVN) to promote awareness, and provide training for making Water Hyacinth handicraft products. NEDFi in Assam first took the initiative of using Water Hyacinth as a raw material for handicraft products which took the entire nation by storm. It started the craft project in 2008 and undertook a capacity building project for a duration of three years from 2010 to 2013. It was a joint initiative by NEDFi and NEC to make the craft popular in the region. The aim of the project was to develop 1000 craftsmen through capacity building, offering market linkages, and enabling micro-credit linkages. Then there was intervention by the National Institute of Design, Ahmedabad to help artisans design products that are robust, and cater to market needs. Thai trainers also trained rural artisans about production techniques and designs which will help artisans cater to the needs of national as well as international markets. NEDFi has organized various exhibitions exclusively for Water Hyacinth craft in small towns as well as big cities. As a part of the promotional activity, NEDFi has coined the products under the brand name *Aqua Weaves*. The project was a great success as the weed is now used as raw material for production of eco-friendly handicrafts. Since inception in 2010, the project has covered 1,294 beneficiaries till the financial year 2011-2012 and most of the beneficiaries are women. NEDFi was declared winner in 2012 of the IABARD Rural Innovation for its contribution towards promoting handicraft products made from water hyacinth.

Table 1. Establishment of Water Hyacinth Project by NEDFi

Year	Intervention	Outcome
2008	Development of flattening machine	Reduction in processing time
2010	First design intervention program with NID, Ahmedabad.	Improvement in process, increase in productivity, introduction of mould, and thermocol moulds.
2011	2nd design intervention program with NID, Ahmedabad.	Weaving techniques, development of surfaces, and its modification.
2011-12	Setting up of Common Facility Centre (CFC), the technology resource centre.	The CFC is unique as it provides facility for all technical inputs.
2012	1st workshop on Thai technology, March 2012.	Significant changes in basic process of treatment, use of mould, and design techniques.
2013	2nd workshop on Thai technology, Feb-April 2013.	Preparation of Water Hyacinth furniture and trendy bags.

Source : KxSd, (n.a.)

NEDFi started the journey of Water Hyacinth handicraft with 25 artisans under its CSR policy, which has now increased to over 3,500 artisans including 100 master artisans providing sustainable livelihood in rural areas of the state.

In addition, Indian Institute of Entrepreneurship (IIE Guwahati), and Rashtriya Gramin Vikas Nidhi (RGVN) also conducted various training programmes in rural areas on Water Hyacinth craft making.

Table 2 shows the modules followed during Water Hyacinth craft making training programme for a duration of x days.

Table 2. Training Programme for Water Hyacinth Craft Making

Training Modules	
Day 1	Inauguration and theory
Day 2	Introduction to weaving
Day 3	Mole making and product development
Day 4	<ul style="list-style-type: none"> • Treatment and preservation of Water Hyacinth • Rope and cap making
Day 5	Theoretical and practical knowledge for production of different machinery products
Day 6	<ul style="list-style-type: none"> • Utility of the products • Product development, tools and techniques of finishing, cost estimation, pricing and market assessment.

Source : Indian Institute of Entrepreneurship, Guwahati.

Challenges of Water Hyacinth Craft

It was only in 2008 that NEDFi started popularizing the Water Hyacinth craft. So, it is not a very new concept in the state. One of the challenges is to include more people from rural areas within the sphere of capacity building for taking up this craft. Moreover, since Water Hyacinth handicraft is not a very old handicraft like bamboo and cane, entrepreneurs face the barrier of uncertainty linked with long term investment and planning. The demand for these handicraft products is less in rural areas where it is actually made. Even though the demand is more in urban areas, due to the presence of middlemen, the products are sold at a higher price, whereas the craftsmen get a very low price. If a big bag is sold in the market for ₹1000, the artisan gets ₹ 300-400 only (Rajbongshi, B., Personal communication Nov 22, 2019).

Implications

The study can be used as a reference by implementing agencies, different livelihood development agencies, and non-government organizations (NGOs) that are working on the promotion of rural livelihood in the state of Assam. Government can also use the study as a reference to review different developmental policies of the state related to employment generation.

Conclusion

Water Hyacinth has indeed proved to be a “blessing in disguise.” The trouble creating weed that grows abundantly in rivers, lakes, and ponds has many alternative uses. We can no longer consider this aquatic plant as a waste of water bodies and should exploit its different potential uses. From the study, it has been found that NEDFi's initiative of using Water Hyacinth as an alternative raw material (instead of bamboo and cane craft) has been successful in developing more than 1,000 artisans in three years from 2010 to 2013. Currently there are over 3,500 artisans, thus creating a sustainable livelihood in the rural areas, particularly empowering women. Thus, there is a huge scope for entrepreneurs in rural areas to invest their skills and ideas in designing various products from Water Hyacinth as these products have huge demand in the national as well as the international market. This will require more awareness among the rural masses regarding the uses of Water Hyacinth, financial, and technical support. The market linkage for this handicraft will lead to the development of the handicraft industry of the state.

Limitations of the Study

The present study has the following limitations :

- It was limited in terms of its respondents. Only 10 respondents could be arranged for telephonic interview.
- The research study was limited to one district.

scope for Further Study

The present study leaves scope for future research wherein, more areas of Assam can be included which cultivate Water Hyacinth, and also the areas which have a potential of utilizing Water Hyacinth for livelihood purposes. Moreover, a comparative study of Water Hyacinth handicraft and bamboo-cane handicraft can be done to find out their commercial viability. Research can also be done on the impact of this industry on agro based economy of the state Assam.

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