



Eco-Friendly Handicrafts from Fish Scales: A Sustainable Approach to Waste Management and Rural Livelihoods

Atul R Chourpagar¹ , and Rumana S. Shaikh^{2*} 

¹Department of Zoology, Dadapatil Rajale Arts and Science College, Adinathanagar, MS, India

²Department of Zoology, Pemraj Sarda College, Ahilyanagar, MS, India

*Corresponding author Email shaikh.rumana7@gmail.com | atul_chourpagar@rediffmail.com

Manuscript details:

Received: 12.08.2025
Accepted: 30.11.2025
Published: 12.12.2025

Cite this article as:

Atul R Chourpagar and Rumana S Shaikh (2025) Eco-Friendly Handicrafts from Fish Scales: A Sustainable Approach to Waste Management and Rural Livelihoods, *Int. J. of Life Sciences*, 13 (4): 445-449.

Available online on <http://www.ijlsci.in>
ISSN: 2320-964X (Online)
ISSN: 2320-7817 (Print)



Open Access This article is licensed under a Creative Commons

Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third-party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

ABSTRACT

Fish scales contain collagen fibers and when thrown away can cause health problems to aquatic organisms and the environment. Reusing fish scales not only reduces solid waste but is also an additional source of income for rural areas, if we engage in creating something with fish waste-based products it could serve as extra income and, at the same time save the ecosystem. In this study the fish scales collected from the fish market of Pathardi, Dist. Ahilyanagar (Ahmednagar), Maharashtra for preparing various fish scales handicrafts like earrings, bracelets, chandeliers, hairpins, and necklaces. It is a creative and interesting work where people can earn money and showcase their artistic skills to protect, restore, and promote sustainable use of ecosystems to conserve biodiversity and use its components sustainably. Fish scales, often discarded as waste, are rich in collagen fibers and can pose environmental risks if not managed properly. This study explores a sustainable and economically beneficial approach to reusing fish scales by converting them into artistic handicrafts. Fish scales were collected from the local fish market in Pathardi, Dist. Ahilyanagar (Ahmednagar), Maharashtra, and used to create various items such as earrings, bracelets, chandeliers, hairpins, and necklaces. This initiative not only contributes to waste reduction and environmental protection but also provides livelihood opportunities, especially in rural areas. By promoting creative reuse of biological waste, the study supports the sustainable use of natural resources and biodiversity conservation.

Keywords: Biodiversity, Ecosystem, Fish Scale, Fish Scales Handicrafts, Waste Utilization, Economic Independency, Women Empowerment.

INTRODUCTION

Handicrafts have been an integral part of human civilization for centuries. Women, in particular, have played a crucial role in the handicraft industry, passing down traditional knowledge and techniques from generation to generation. Today, handicrafts have gained a newfound appreciation for their artistic value, cultural significance, and economic potential. One of the handling of fish scale waste is to make accessories.

According to Enen (2004) in Marmata (2019), fish scale waste is interesting to shape, arrange, and assemble and can explore creative ideas. The seafood industry makes a remarkable contribution to the global economy which helps in the improvement of social wellbeing in nations. Usually, people are involved in the capture of fish from natural resources like the marine sector, rivers, lakes, and wetlands or farming of fish in both fresh and brackish water. Mostly fish are exported in processed condition in the form of fillets or whole-dressed fish. So, fish processing industries are also growing worldwide. During fish processing a huge amount of solid waste is generated as only 40- 45% of the whole fish is considered edible part and the rest is disposed of with minimum treatment causing environmental pollution. Waste utilization is an important issue for the seafood industry from both a regulatory standpoint as well as one that has potential economic impacts. Currently, fish wastes are being utilized for the preparation of fish meal, oil, fish protein concentrate, enzymes, colorants, gelatin, glue, chitosan so on which are mainly prepared from bycatch, small fish, skin, liver, exoskeleton, etc. But the fish scale is very ignorant in this issue. During processing, scales are just been thrown as solid disposal and create unhygienic conditions in the market area. Fish scales are used for the preparation of pearl essence and collagen, sometimes glue to some extent but the thick and attractive scales of various fishes like catla, mahseer, and grass carp can be used for ornamental and other purposes (Helfman, et. al., 1997). Fish scales can be a very good raw material for the cottage industry where women can be involved in preparing various types of beautiful ornaments, home decorative items, and dress designing materials very easily in a simple way just by

washing, drying, coloring, and cutting the scales in desirable shape. This cottage industry does not require any machinery and can be run well with very low capital investment. This work is considered as a potential way to empower rural women socially and economically by involving them in such a creative and interesting work.

Fish scale is considered an inedible part of fish and during processing, scales are just been thrown as solid disposal and create unhygienic conditions in the market area. To minimize pollution and utilize the waste materials fish scales are generally used for the preparation of pearl essence and collagen, glue, and fish scale powder with rich nutrition in some extent.

MATERIAL AND METHODS

Fish Scale

Fish scale is a rigid plate that originates from the epidermal and/or dermal layer of skin and generally constitutes 1-2% of the body weight. Scales of fish may be divided into several types based on composition and structure and categorized into five different types placoid scales, cosmoid scales, ganoid scales, cycloid scales, and ctenoid scales. The scale used for handicrafts should be hard enough to tolerate the treatments during processing, thick and smooth-edged scales, and greater flexibility. Cycloid scales are used for the selection of raw materials (fish scales) for decorative product preparation. Scales from Catla, mahseer, grass carp, and common carp of more than 2 kg body weight are most appropriate for the preparation of ornamental and other decorative items. But large-size Ctenoid scales also can be used for this purpose.





Fig. B. Fish scales were segregated and store in box.



Fig. C. Students were engaged to make the beautiful jewelries and accessories from waste to best.



Fig. D. Tool kit and Jewelry box.

Collection of Fish Scale

Fish scales are easily available in fish markets as scales are simply thrown away as solid waste so fish scales can be collected from fish vendors who sell ready-to-cook fish from Tisgaon, Pathardi fish market (Fig. A).

Raw fish scales can't be used directly. Processing of scales is necessary to prepare any ornaments and decorative items from fish scales as some unwanted materials like blood, flesh, skin, slimes may adhere and be responsible for spoilage and fouling smell. Before making accessories, fish scales must meet appropriate standards as raw materials for making these accessories, here are the steps to make fish scales suitable for use as raw materials for handicraft products according to Paresti *et al.* (2017). Rinse the scales in clean water to remove blood, slime skin, etc. Add a small amount of salt to the scales rub well for 5 min and wash them again in clean water. Take 500 ml water, add 2 tablespoons of detergent powder, and

soak the scales in detergent water overnight to wash them properly. Wash soaked scales in clean water and dry in the shade. Now the scales are ready for use immediately and can be stored in air-tight containers at room temperature for years (Fig. B).

RESULTS

For preparation of fish scale items dried scales are colored with commercial color and cut into particular shapes as needed with the help of scissors. Then colored and shaped scales are arranged and stuck together using strong adhesive to give the proper form of particular items (Fig. C). Various ornaments and home decorative items can be produced out of fish scale. In this study the fish scales collected from the fish market of Pathardi, Dist. Ahmednagar, Maharashtra for preparing various fish scales handicrafts like earrings, bracelets, chandeliers, hairpins, photo frames, and necklaces (Fig. 1 to 6).



DISCUSSION

Fish scales can be collected from the market at a very low price so there is a minimal investment needed for

the preparation of various items. It will help in optimum resource utilization minimizing waste generation. It will be helpful for waste management and pollution control. It is a creative and interesting

work where people can earn money as well as showcase their artistic skills. For this work there is no requirement for complicated machinery only a cutter, scissors, and glue gun-like small tools are enough to make these products. There are no laborious activities involved so women can do this work in their spare time at their home itself. Fish scales can be a very good raw material for the preparation of various beautiful ornaments, home decorative items, and dress designing materials very easily (Rizky and Junianto, 2021). For the preparation of different products like fish scale ornaments and home decorative items, some characteristics must be in consideration.

These activities have the potential to empower rural women economically and socially. Empowering women through handicrafts is a powerful tool for promoting gender equality and sustainable development. By providing women with access to education, training, markets, and financial support, and promoting collective action, we can create a more inclusive and equitable handicraft industry that benefits women, their families, and their communities. Women's involvement in the handicraft industry has deep cultural and historical significance, and their contributions to the industry's development and growth are significant. Fish scales are the most negligible fish processing waste which is only used in some specific and limited by-product products. But the approach of Fish scale ornaments and decorative items production not only can beautify the women and their homes but also can beautify the environment by reducing solid waste disposal. This work is considered as a potential way to empower rural women socially and economically by involving them in such a creative and interesting work.

CONCLUSION

By empowering women in the handicraft industry, we can create a more inclusive and equitable world where women can achieve their full potential, where they can earn money as well as showcase their artistic skills to protect, restore, and promote sustainable use of ecosystems to conserve biodiversity and use its components sustainably step towards the mission of waste to wealth.

Acknowledgement:

We would like to thank Dr. G. K. Kulkarni, Former Professor and Head, Department of Zoology, Dr. Babasaheb Ambedkar

Marathwada University, Chhatrapati Sambhajnagar (Aurangabad), for giving us the opportunity to work. We are grateful for his valuable suggestions and guidance, which helped improve our research work. We also thank our college for its support and encouragement throughout this project.

Conflict of Interest: The authors declare no conflict of interest in relation to this research.

Data Availability Statement: Not applicable.

Orcid id

Atul R Chourpagar <https://orcid.org/0000-0001-7127-6731>

Rumana S. Shaikh <https://orcid.org/0009-0004-4522-9690>

Correspondence and requests for materials should be addressed to **Rumana Shaikh**

Peer review information

IJLSCI thanks the anonymous reviewers for their contribution to the peer review of this work. A peer review file is available.

Reprints and permissions information is available at <https://www.ijlsci.in/reprints>

REFERENCES

- Arina, R. Kamal., Novita. Utilization of Fish Scales for Souvenir Crafts. *Scientific Journal of Family Welfare Education Students*, 2019, Vol: 4 No. 2 things: 39-49.
- Cartmell Paul. What Are Fish Scale Functions? November 01, 2017, <https://animals.mom.com/what-are-fish-scale-functions-4129749.html>.
- Helfman, G. S., Collette, B. B. and Facey, D. E. The Diversity of Fishes. Blackwell Science, 1997. Pp. 528.
- Kusnadi, Sari P., MP Sari. Utilization of Fish Scales Waste into Creative Products with High Economic Value for Labor Fishermen. Harapan Bersama Polytechnic Tegal, 2018.
- Paresti S., Dewi SHN, Sukri, Ichda C. PRIVATE. Center for Curriculum and Books, Balitbang, Ministry of Education and Culture, 2017.
- Roberts, C. D. Comparative morphology of spined scales and their phylogenetic significance in the Teleostei. *Bull. Mar. Sci.* 1993, 52(1):60-113.
- Rizky Taufiq Rohman and Junianto. Review article: The use of fish scales for accessories GSJ, 2021: Volume 9, Issue 12, December 2021, Online: ISSN 2320-9186 www.globalscientificjournal.com
- Wikipedia contributors. Fish scale. In *Wikipedia, The Free Encyclopedia*. 2020, May 3 https://en.wikipedia.org/w/index.php?title=Fish_scale&oldid=954586348.

© The Author(s) 2025

Publisher's Note

IJLSCI remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.