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# A Participatory Study on the Role of Visual Arts in Environmental Literacy Programmes on Wetland Conservation for School Children

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## ABSTRACT:

Environmental education has the power of raising the ecological consciousness of children in the formal education system. Environmental education is key to sustainable development as it not only sensitizes children on the current global environmental issues but also prepares them for future challenges. In India, environmental education was made compulsory in schools and higher education institutions by the apex court in 2005. However, the integration of environmental education into curriculum had its own issues and challenges. Some schools have performed exceptionally well in the implementation of environmental education with collaboration and support from environmentalists and environmental organizations. These collaborations with innovative teaching methods help in sensitizing young children on local and contextual environmental issues. This research paper presents the findings of an environmental literacy programme for children to conserve wetlands of river Thamirabarani, using visual arts as part of their formal course on environmental education. Visual arts are art forms that include drawing, painting, photography, video, films, documentaries and crafts. Around 30 students from a private school in Tirunelveli were selected for this research and were imparted knowledge on wetlands through various visual media. While films screened focused primarily on the issues concerning wetlands, the discussions and reflections after watching films helped children to locate the exact environmental problems in the Wetlands of Thamirabarani and have clarity of thoughts to step into relevant action. Pre and post survey and in depth interviews were the methods of evaluation. The results revealed that environmental education using visual arts was helpful to orient school children so as to develop critical thinking and to indulge in pro environmental activities and to have positive behavioural changes to conserve the environment.

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**Keywords:** Visual Arts, Environmental Education, Wetlands, Biodiversity, Behavior Change, Literacy, River Thamirabarani, Ecological Consciousness, And Participatory Study.

## INRODUCITON

Ever since the International Union for the Conservation of Nature (IUCN) sanctified the notion of Environmental Education (EE) for the first time in the world way back in the 1970s, there have been several stages of evolution in the development of environmental education policies across the world. Agenda 21 takes a lead to incorporate all environmental-related policies made earlier and comes as a policy of the world to end environmental exploitation and devastation. Environmental education has been thought out to be the centre of all initiatives for sustainable development. In the Indian context, EE has been always considered from a developmental perspective. In fact, India has been one of the pioneers in proposing environmental conservation in its constitution much before the IUCN's formal declaration on EE. Article 48-A and Article 51-A (g) of the Indian constitution guide both the State and the Citizens to protect the environment and take it as a fundamental duty to safeguard natural and environmental resources. Historically, protection of the environment has been part of Indian culture where nature is worshiped as a benevolent deity. Traditional knowledge system has a huge potential in helping in conservation of nature. India, being a diverse nation with varied geographical terrain with rich biodiversity, local and contextual ecological knowledge is important to help in conservation of nature. The researchers, with an aim to disseminate local and contextualized ecological knowledge, chose to use visual arts in environmental education to school children in Tirunelveli District, Tamil Nadu, India, to conserve the wetlands of river Thamirabarani. River Thamirabarani includes seven different small rivers along its way originating from Agasthyarkoodam, the eastern hills of the Western Ghats located in Tirunelveli District, Tamil Nadu, India. As the only perennial river in this state having rare and rich biodiversity, it is also an important water source for four southern districts. The wetlands of this river are facing serious threats due to developments like encroachments, domestic sewage discharge, industrial effluents, and agricultural pesticide and fertilizer contamination. Creating awareness on the importance of wetlands and water bodies is an important link towards conservation. Local and contextualized environmental education can greatly help local communities understand ecological issues, which can translate to action. Visual arts in particular have the huge potential to engage young children. The study was based on the use of visual arts to foster environmental education. This study, which is an action research, provides an insight into the need for using visual arts in disseminating local and contextualized ecological knowledge to inform and educate children on the environment.

## RESEARCH QUESTIONS

1. What is the role of visual arts in sensitizing children on ecological issues?
2. What is the impact of local and contextualized environmental literacy on the ecological consciousness of school children?

## METHODOLOGY

This study is an action research that used visual arts both to engage with children and to elicit research data for the study. The study aims at discovering the possibilities of engaging school children using visual arts to make them ecologically conscious individuals. Research using visual arts includes the incorporation of visual related material like video, digital photography, documentaries, mime, painting and artwork. Visual art has also been chosen as a method to test the impact of environmental education as children can feel comfortable in sharing their perception through arts rather than through written words.

## SAMPLE

The participants in the study were from an English medium private school in Tirunelveli District, South of Tamil Nadu, India. A total of 30 students from a private school in Tirunelveli District (n = 30) participated in the study for one year. The gender ratio was 15:15 with equal numbers of male and female participants.

## METHOD

A clear picture and objective of the whole research was given to the school children who had the freedom to be part of the research or to withdraw. They were also informed that their withdrawal from the research would no way affect their valuation marks either in their other subjects or in the programme given. The enrolled children cooperated to do the pre and post-survey. Only two children were omitted from analysis, one student because the individual works given were incomplete and the other one due to very low attendance. The course offered was under choice based credit system and so children who were interested in environment and visual arts opted with enthusiasm.

The impact of this documentary based environmental study programme on students' environmental attitude (EA) was assessed. Data were collected in two different methods:

1. A pre and post-survey, and 2. Engaged in focus group discussion and group-based

activities that measured the interest level and the attitude of the participants towards the environmental issues. There were also post-instruction interviews with the children in order to comprehend their perspectives on their absorbing and learning gains. As the students usually had to leave the campus immediately after their class hours, interviews were conducted 2-3 months after the instruction as per the convenience of the children. The application of focus group discussions (Greene & Hogan, 2005) draw-and-write/speak technique (O`zden, 2009), reflective diaries (Niewenhuis, 2010) and drama (Podlozny, 2000) enhanced the data collection in research. In this study, the combination of these visual arts to elicit data enabled the researchers to analyze the knowledge, skills and practices of children with regard to wetland conservation.

### **PRAXIS - 1**

#### **DOCUMENTARY SCREENING**



*Figure 1 Image from a documentary on Thamirabarani wetland*

The documentaries selected for this study programme were open source materials. The carefully curated documentaries primarily covered the environmental issues facing wetlands, specifically films related to river Thamirabarani. In addition to these works films like Inconvenient Truth, 11th hour, which talked about global environmental issues, were also screened for the children. Table No 1 provides the list of curated works on the river screened to the school children. The documentaries selected with an aim of imparting environmental education to participants on wetland conservation. For example, the documentary named '*Ulagame Viantha Tamilarin Neer Melanmai*' (2018), for example, provides information on traditional ecological knowledge of the Tamil community with special reference to water management.

**TABLE 1. THE LIST OF DOCUMENTARY FILMS USED IN THE STUDY**

S.No	Films with Year of Release	Topic/Theme
1.	An Inconvenient Truth (English) (2006)	Global Warming and Climate change.
2.	The 11 <sup>th</sup> Hour (English) 2007	Global Environmental Challenges.
3.	Tapped (English) 2009	Bottled Water Industry.
4.	Chasing Ice (English) 2012	Melting Glaciers
5.	More than honey (English) 2013	Agricultural Practices and Vanishing Bees
6.	Wetland Functions & Values: (English) 2014	On Wetland Ecology
7.	Wetland's Ecosystem: Characteristics and Functions (English) 2015	On Wetland Ecology
8.	Ungalukku Theriyuma? (Animation in Tamil) 2016	On Environment Impact Assessment (EIA Process)
9.	Yathum Oore , Inaivom, Ianippom (Tamil) 2016	Chennai Floods
10.	Water Politics (Tamil) Poovulagin Nanbargal 2016	Water Politics
11.	Mass Media and its role in Education (English) 2017	Mass Media and Visual arts
12.	Story of River Thamirabarani (Tamil) 2017	River History
13.	Vivasayamum Thanneerum (Tamil) 2017	Water & Agriculture
14.	Ulavu Paarvai (Tamil) 2018	Air Pollution
15.	Ulagame Viantha Tamilarin Neer Melanmai (Tamil) 2018	Traditional Water Management System

The objective of this research is to study how visual arts can be a tool to create environmental literacy among school children. Before initiating the research works, firstly the researchers asked students to tell stories of their own related to the environment and interacted with them to assess their knowledge level vis-à-vis environmental issues. The researchers used 15 documentary films (n= 15) for this study. The selected films were screened to children periodically for understanding global, national and regional issues on the environment. The post documentary screening discussions involved the school children to select their favorite theme in the documentary and get into collective activities as a class. Small group reflective discussions were encouraged as this usually gives school children more chances to express their perceptions on the issues. The participants were oriented to suggest opinions on the documentary they watched, and the perceptions of children were elicited through visual arts presentations like drawing, clay modeling, mime painting and photography. This paved way for the children to involve themselves in the environmental issues and also find local solutions to conserve nature. Worksheets and activity notebooks were with the children to write and make class wise decisions to save nature at their level. For instance the children will be posed with a question such as, “What would you do if you were residing in a place near a polluting industry which releases its effluents into River Thamirabarani?” The children knew the essential need of this river as a prime water source for people in four different districts as illustrated within the film (See Table 1) *Story of River Thamirabarani 2017*. The children presented their responses and impressions to other members in the class for discussions too. The class teachers were present during this phase as moderators to guide the participants through these activities. The stories and group activities were shared with the school psychologists regularly to judge behavior change enhancing factors. The researchers wanted the participants to apply visual arts to stimulate their imagination and critical thinking on the environmental crisis within their geographical context. In terms of positive behavior change, the researchers wanted to test how this engagement through visual arts could create or increase ecological consciousness and behaviour change for ecological conservation.

**PRAXIS -2 PARTICIPATORY VISUAL ARTS**

The Participatory Visual Art is a mixture of creative forms of communication and illustration of films, documentaries, drawing, mime, design, music, painting, creative writing, and collage. These activities involve coordination among various stakeholders in the project in order to reach the goals of the environmental literacy programme.



*Figure 2 Visual art session at Thamirabarani wetland*

*Figure 3 Visual art session at Thamirabarani wetland*

**Table 2. Usage of visual arts in the study**

<b>Strategies used to observe the changes in ecological knowledge, skills and practices among the participants in the program</b>	
<p><b>Visual Artwork/talk:</b> In this activity, the children were engaged in creating a visual artwork i.e. drawing/painting, mime/skit to exhibit their knowledge and understanding of the themes in the documentaries.</p>	<p><b>Photography:</b> In this activity, the children had to use digital cameras to shoot photographs in a field visit, which is associated with the film they watched on wetlands.</p>
<p><b>Prompt:</b> You can choose the language in which you are comfortable both in writing and speaking. You need to express your environmental knowledge gained from the documentary through your visual artwork drawing/painting, mime/skit, etc.</p>	<p><b>Prompt:</b> Click a picture with the camera provided to you, you could get the assistance of your teachers or senior students or from the research team. Tell us the meaning you make out your photographs. You can also find a photograph from sources like magazines or newspapers which could express your feelings related to what you learned from the documentary and group activities. You could write or tell a story of your work in any language you are comfortable.</p>

One of the benefits of this method is that it allows children to have a say in the construction of data (Coad, 2007). Children ought to be taken as active providers in things that are concerned to their lives (Clacherty & Donald, 2007; Einarsdottir, Dockett, & Perry, 2009) and they must be given sufficient time and place to manifest themselves (Tay-Lim & Lim, 2013, p. 66) (Thomson, 2008). This encompasses the researchers to design the research process carefully, so that “children have specified space to fully involve themselves” (Gallacher & Gallagher, 2008, p. 502). Added to that, power dealings got to be prudently pondered when researching with children (Holt, 2004; Spyrou, 2011). Children usually are not used to grown-ups asking for their opinions and are usually timid to share with people perceived as symbols of authority (Einarsdottir et al., 2009). James (2007) also notes and critiques the overall absence of critical thinking on approaches that endorse children’s representation in research. Participatory visual arts, therefore, considered being suitable in doing research with children.

During the course of time the researchers realized the importance of native language and the contextual realities that should be taken into serious consideration when using research with children. And the need of another factor called “scaffolding” was identified. The Researchers noticed children were initially hesitant and showed less interest in using visual arts. On enquiring about this the researchers learned that the participants had never been involved in such class works earlier and that the participants were not familiar with this kind of method. Therefore, assuming that all participants will be comfortable with methods of this kind is faulty. But it has been proved that the “Draw and Write/speak” method has been effectively used among school children (McWhirter & Wetton, 1998). This is where the researchers had to introduce the tool of “scaffolding”. Scaffolding is defined in the work of Gibbons (2002, p. 10) as the “temporary assistance by which a teacher helps a learner know how to do something so that the learner will later be able to complete a similar task alone.”

## CLAY MODELING/PAINTINGS



*Figure 4 Clay modeling*



*Figure 5 Mat painting*

The researchers observed that the children's visual art works in the form of drawing/painting in many cases did not go with the prompt given in *Table 2*. For instance, two participants (*Figure 4*) tried to do some clay modeling representing some images in one of the documentary films on river Thamirabarani screened to them but they were not able to explain their model with reference to environmental knowledge they had gained. So the researchers found that there was a need to explain the task again. They were given ample time to get to understand the prompts and were given space to explain what they understood from the film shown and what they intended to communicate through the clay model. With the help of scaffolding they were able to express that the birds in a documentary on Thamirabarani wetlands shown to them in the class attracted them and that they were trying to give shape to the images which they observed in that documentary. Through some simple questions posed to them they were able to explain what they had in mind and their associations with those images. The researchers were able to understand the minds and perceptions of the children and the emotions that particular documentary had induced into their minds. *Figure 5*: "Healthy Wetland" mat painting by another participant. The painting was described in his own words, "I like doing this work as I was inspired by the documentary *Wetland ecosystem: Characteristics, Functions 2015* (Find Table 1) on Ecology and Environment. This task kindles me to actively care for nature". His description and interest level gave the researchers data related to the social-ecological theory and the significance of disseminating local and contextual ecological knowledge (Ungar, 2011). Though the works of children were made easier through visual arts, scaffolding was needed to bring out their thoughts and understanding as to know how they derived the meaning; to understand how documentaries influenced them; and to study

how media education was helpful to them to relate environmental issues to their lives. The researchers realized that the data gathering should not be hurried and one cannot simply assume that the children easily can understand things through visual arts as it was found that more time was needed when doing research with children. Obviously the age factor was an important variable when testing their ability to understand and keep the prompts. For instance, a participant who made mat painting (*Find figure 5*) was older than those who made clay modeling and was able to clearly articulate how the documentary he watched helped him perceive a wetland set up. He was able to give a much more detailed visual and tagline to explain his work of art than those who made clay modeling. This child's narrative helped us identify signs of positive behavior change. It was also revealed that the documentaries used in this programme influenced him to express the meaning of the visual art he had produced (the mat painting). Children's stage of cognitive growth was evident between participants who made clay modeling and the one who had produced mat painting. It was surprising that even after scaffolding some children were not able to explain their visual arts. When the researchers first checked their willingness to express something on their own creations using visual arts not many opted to do so and in fact they were doubtful and uncertain about how to interpret. This was very important for the researchers not to embarrass the children by giving them a negative message that they could not express in writing. So the researchers just asked everybody a few simple questions related to their visual art works to elicit data on the knowledge, attitudes and practices of the children.

### **PHOTOGRAPHY & COLLAGE**

Shooting photographs or collecting photographs or images regarding the environment was another activity children were engaged with. The children had to click a photograph with an automatic digital camera or to collect images from magazines or newspapers in connection with the environment, the wetlands in particular. The researchers opined that cutting images or collecting photographs from different magazines and newspapers might not be a hard task for the children because they had to just handpick what they desired to bring to the research. Children had this task as homework, before their vacations and had to return with their works at the time of reopening of school; It was surprising to note that only a very few had come with their photographs or collected images. The researchers learned from the children about their lack of access to newspapers or magazines at home.



*Figure 6 Scaffolding by a senior to shoot with camera*

At this point the researchers had to provide them with both digital cameras with the assistance of teachers or seniors and magazines and newspapers. It was true that the magazines and newspapers that we provided might not have fulfilled the interest of some of the students but the researcher had to do so as many did not have access to newspapers, magazines and digital cameras at home. After the children had access to digital cameras and gadgets they needed, the researchers noted that they were able to use them properly as few sessions covered understanding media and photography. Some were simply cutting pictures or clicking photos but not able to relate to what they learned through documentaries or group activities. It was evident that such pedagogical learning at school was totally new to them and their acquaintance with such creative learning was limited as they were used to classroom teaching and learning methods. So now and then the researchers had to bring them back to the prompts, to enable them to stick to their tasks.

The researchers showed the children how they can create narratives through photographs (*Figure 7*). The researchers described the meaning of this photograph saying, “Listen to the narrative of nature and its creatures, hold them to realize how beautiful it is to live in harmony with nature”. The photograph was also interpreted how one needs to trust each other to live a life of happiness. The children then tried to come out with their own story with nature photography (*Figure 8*), and they succeeded to make visuals with their own narratives that provided the researchers with sufficient data. The researchers observed the fact that their association with nature and creatures grew closer. The participant who shot this photo interpreted the message of her photograph saying, “What I learned through this exercise was that protecting the nature and animals should be our first concern”. The researchers told her to give some more details on her photograph, (*Figure 9*) and she said that this photograph was inspired by a documentary film shown to her namely *Ungalukku Theriyuma? (Tamil Animation Film) 2016 (See Table 1)* related to EIA (Environment Impact Assessment) and caring for one another and therefore she believed that it was important that all people needed to care for even small worms. Ungar (2008) notes that children and youth can learn from their experiences and failures and develop self-efficacy which is a private belief that they can perform a task successfully” (Bong & Skaalvik, 2003, p.6). Hence it's important that researchers scaffold the research process by checking with each participant and taking note of all of them.



*Figure 7 Scaffolding by seniors to shoot with camera*



*Figure 8 Participant's photo*

## NATIVE LANGUAGE



*Figure 9 Learning from photographs*

Hennesy and Heary (2002, p. 48) comment that in focused group discussions, children are often likely to supply responses that are offered by an earlier speaker. However, using techniques like artwork and photography present children a chance to elucidate their metaphors both orally and vocally and autonomously from others (MacGregor et al., 1998; McKay & Kenrick, 2004; Guillemin, 2004). Though the children had English as the medium of language at school the data collection was easier and successful when they were allowed to use Tamil, their native language. The researchers would not have collected good data if only the English language was used for dialogue and communication with the children. As some children made repeated requests to explain the prompts the researchers translated all instructions into children's native language sensing their need to understand the prompts clearly. From these incidents, the researchers felt the need for using native language and understood the impact of native language in a given research situation and in environmental related programs. However some students were exceptional in English and they were able to express their works in English. Thus the children were given the option to choose any language in which they were familiar with. The translation problems from Tamil to English, was sorted by the researchers by asking the participants to orally express what they meant by their visual arts and then the messages were interpreted. The authors were able to translate them into English.

## KNOWLEDGE, ATTITUDES & PRACTICES

Data collection with school children in a setting totally new to them for such learning demanded the collaboration of their schoolteachers to understand their contextual difficulties during our research. The researchers realized that working with children's teachers was a basic need to understand the responses of the children. Using visual arts in education was time consuming and conducting planned sessions without disturbing the regular rhythm of children's other routines in the school like their transport schedules were challenging. The school had sometimes a change of timetable and the researchers had to adjust and reschedule the sessions of data collection. The teachers shared that the participants who were part of this research showed signs of confidence and positive behavior change towards conserving nature after they engaged themselves in this project.

## SIGNS OF POSITIVE BEHAVIOUR CHANGE LED TO ACTION

### Miniature wetland pond by participants at school venue



*Figure 10 Wetland miniature by participants*

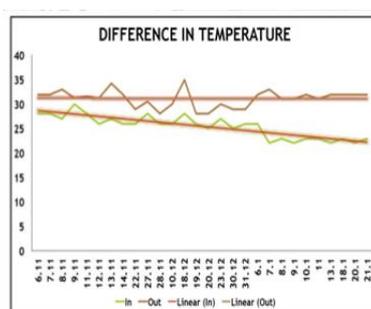
Participants with all knowledge gained from some of the documentary films on Thamirabarani wetlands and biodiversity were able to create themselves a miniature wetland pond within their school campus (Figure 11) showcasing the biodiversity of Thamirabarani wetland.



*Figure 11 Wetland testing at riverside*



*Figure 12 By participants*



*Figure 13 By participants*



*Figure 14 Mime on wetlands*

They also learned to make humidity and water temperature checks on their own (Figures 12&13) and were able to do it in their own school pond and in River Thamirabarani to analyze the pollution level. They were able to create concepts out of visual arts (Figure 14) in a form of mime and were able to deliver a stunning onstage performance on conserving the environment during the Thamirabarani Birds festival competitions conducted by ATree Research and Biodiversity conservation Centre. They won first place among 20 different schools, which participated in the competitions. The participants maintain the miniature pond in their school campus, observe the plants, flora, and fauna regularly, and spread this knowledge to other students to conserve nature. Thus the environmental education to schoolchildren using participatory visual arts resulted in positive behavior change among the participants and led to action to conserve the environment.

## FINDINGS

Using visual arts in environmental education among children is a very challenging task however it is an effective method for dissemination of ecological knowledge. Visual arts in environmental literacy helped participants to have positive behaviour change towards wetland conservation. Using native language in environmental education is important to improve the participation of young children in the program. Native language was also useful in disseminating local and contextual ecological knowledge to the children. Scaffolding was also necessary to improve active involvement of children in visual arts activities. Environmental literacy programs need a holistic approach, in order to reach its goals. Environmental literacy programs require systems support, human resources and finance to be implemented in its full spirit to have the necessitated impact on children. Environmentally literate generation is imperative for achieving the goals of sustainable development, hence schools need to focus more on developing newer activity based pedagogy with support from local environmental agencies for better teaching learning process.

## CONCLUSION

Utilizing visual arts for positive environmental behavior change using documentary films as pedagogical aid, artworks and photography as a participatory research method to elicit data has been proved to be effective among school children in this study. Though the researchers found that it was a herculean task to apply this method among the school children because of its demand for a lot of time and patience, this research was carried out for establishing the fact that using visual arts is a successful method for inculcating positive environmental attitude among the participants. It was also found that localized and contextualized environmental education with field trips, visual aids and activity based learning is more effective than text book oriented classroom teaching in ecological reaching the concepts to young children. As water starved state, with ongoing water conflicts with all neighbouring states it is important to educate young people on the importance of conserving wetlands. Conservation of wetlands of a perennial river like Thamirabarani is crucial in sustainable development of the entire region. This study using visual arts for raising the ecological consciousness of young school children to conserve the environment (wetlands) was effective in disseminating knowledge, changing attitudes and practices of children towards pro conservation behaviour.

**Declaration: Ethical procedures followed**

The researchers addressed the ethical issues by following all norms related to research with children and obtained the parental consent through the school to undertake this research.

**Declaration: Funding details for Research**

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