



## DESIGNING AND VALIDATING AN ENVIRONMENTAL AWARENESS SCALE

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### ABSTRACT

*The problem of global warming is threatening the entire globe to meet with catastrophes in the form of flood, increasing ocean level, occurrences of tsunami, forest fire, eruption of volcanoes, earthquake, etc. Though education is developed in almost all the nations of the world, the awareness about the environment wherein the people are living is not found to be at the expected level. It may be attributed to lack of attention to this critical problem on the part of the educationists and environmentalists to incorporate these crucial issues in the school curriculum at the start of formal education itself.*

**KEYWORDS:** Global Warming, Environmental Awareness, Crucial Issues & Curriculum.

### INTRODUCTION

In the Indian context, especially of students studying in the state board schools in rural as well as urban areas, the common understanding of the nature of environment and its preservation is very much lacking. Again when the Researcher looks for validated readymade instruments for assessing the environmental awareness of higher secondary students, he couldn't come across the appropriate one suitable for the students of Tamilnadu more specifically the students at higher secondary level in the market. Therefore, the Researcher has decided to design a tool for assessing Environmental awareness at higher secondary level appropriate to the environmental conditions prevailing in the region.

### DESIGNING THE INSTRUMENT

In order to construct the tool for assessing environmental awareness the Researcher look into relevant literature on environment, environmental issues, environmental problems, environmental awareness and probable solutions for solving environment related issues. From the reviews, the Researcher has identified SEVEN facets highly related to the environmental issues and environmental problems. Therefore, the Researcher has fixed the following seven facets which are strongly related to environment and environmental problems.

- ✓ **Water Pollution**
- ✓ **Ground water Depletion**
- ✓ **Air Pollution**
- ✓ **Destruction By Natural Forces**
- ✓ **Causes for Natural Calamities**
- ✓ **Means of Safeguarding Life, and**
- ✓ **Health Consciousness**

Treating these seven facets as the probable constructs of environmental awareness, the Researcher has adopted them as the dimensions of the proposed research tool **Environmental Awareness**



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**Scale.****REVIEW**

In order to theoretically establish the aptness of the proposed dimensions, the Researcher reviewed researches done on environmental awareness, environmental problems, etc, and identified the relevant research outcomes for each one of the dimensions. The brief abstract of the research studies chosen is given here below to substantiate the influence of each dimension in forming environmental awareness.

Vergnoux, A, et al (2011) have published a study on 'A multi-disciplinary investigation of aquatic pollution and how to minimize it'. The authors designed experiments to teach critical thinking about 'water pollution' and how citizens can minimize it. The experimental session takes place in a public training centre for experimental science located within a research institute. The classroom is divided into groups of four to seven students and each group is treated by a research scholar. The subjects of the study that is the high school students are given results from publications on fish mutations to develop hypotheses, perform experiments and discuss the results. Students learn to ask and answer questions like: what are the origins of biological and chemical pollutants in aquatic ecosystem?. How can the population be made aware of aquatic pollution? How can the willingness of the local population to pay for the protection of their ecosystem be evaluated? At the end of the experimental sessions the students of the experimental group were far more superior to the reference group in demonstrating the awareness about aquatic pollution.

Hamid, Suraya, et al (2017) published a paper on 'Social media for environmental sustainability awareness in higher education' to garner interest of students and staff on environmental issues. It is reported that sustainability practices conducted at the university level such as water consumption, paper reduction, reduction of electricity, and recycling have enhanced sustainability awareness, which in turn also increased good behaviour in students.

In another study Wang, Zhen (2016) 'air pollution and exercise; a perspective from China' has revealed clearly the hazardous life conditions of Chinese people afflicted by air pollution crisis. The study has revealed the lamentable conditions prevailing in China and voiced a strong warning to the nations of the world to look up and note how far is the Damocles sword hanging over their heads to take preventive measures to safeguard the life on the earth.

Karuppaiyan, S (2007) has published a research on 'impact of tsunami on human security: a critical analysis with special reference to India'. The researcher highlighted the internal damage caused by tsunami in the form of 'fear' more than the physical destructions in the form of loss of human lives, properties, and demolition of all living sources. The psychological fear is found to be present even now among the population after a lapse of more than a decade. After tsunami affected masses in the state 95% required counselling to return to normal life, 2% are to be subjected to intensive medical interventions and the remaining lot are treated both by drugs and counselling. Infact, 46148 individuals and 14410 families have been provided with psycho-socio support in the tsunami affected area.

A study related to health consciousness of higher secondary students – Environmental risk perception has brought about an encouraging positive outcome. The study published by Anilan, Burcu (2014) revealed that the high school students participated in the survey regarded active and passive smoking, nuclear waste, HIV, the use of alcohol and drugs as 'very high level' environmental risks. They also expressed that environmental problems could be resolved by changing people's attitude towards nature and standard of judgment. They are aware that 'leading a healthy life in a naturally protected environment is of greater importance than having a high quality life'. All these enable the Researcher to concretise his thinking about the relevance of health consciousness in forming or strengthening one's level of environmental awareness, he presented health consciousness as a constituent of Environmental Awareness.

All these indicate the validity of the dimensions chosen for constructing the environmental awareness scale.

## PROCESS

After finalizing the dimensions of the environmental awareness, the Researcher prepares test items for each dimension in the form of objective type questions. Altogether for all the seven dimensions the Researcher prepared 39 questions. After this, the Researcher started the process of establishing *content validity* and *item validity* and finally establishing *reliability* of the tool.

### Content validity

The prepared draft tool with the scoring scheme was given to three experts including the research supervisor, with a request to scrutinize and give suggestions for improving the quality of the test items. After receiving their suggestions, the Researcher systematically carried out them and as such the *content validity* of the tool was established.

### Item validity

Item validity was established by computing *difficulty* and *discriminative* indices. The items which couldn't meet the specified standard value were deleted. Thus, *four* of the following test items were dropped from the draft tool, making the total number 35.

### Reliability

Then the modified tool was subjected to the test of reliability. The researcher followed *test-retest technique* to establish the reliability of the tool. The reliability coefficient reporting *0.814* confirmed the reliability of the scale prepared.

### Final form of the tool

#### Environmental Awareness Scale

1. I don't allow anyone known to me to drink polluted water. Because:
  - a. We may not get immunity
  - b. Different diseases may affect
  - c. All will praise me
2. The crowding of housing colonies in towns and cities is to be controlled. because
  - a. The quality food materials are not available
  - b. Ground water gets decreased
  - c. Cost of living rises
3. As wood coal, petrol, diesel are used as fuel:
  - a. Smoke, heat and carbon-di-oxide get mixed with air
  - b. Traffic jams are caused
  - c. Natural resources get reduced
4. The tremors occurring on the sea coast are due to:
  - a. Turbulence of sea
  - b. Travelling of tsunami towards the sea shore
  - c. The signal for the forthcoming earthquake
5. The major reason for not being able to prevent flash flood is:
  - a. Heavy rains
  - b. Lack of sufficient reservoirs
  - c. The blocking of canals discharging the accumulated water
6. People living in places prone to earthquake should First know:
  - a. The ways and means of saving the house from much distractions
  - b. The ways of keeping gas stove and other electrical appliances not causing fire
  - c. How to give first aid effectively
7. I wash my hands before eating. Because:

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- a. The palm gets cleaned
  - b. The microbes on the palm cannot enter through food
  - c. Being a childhood practice still I continue
  8. The main reason for the pollution of underground water
    - a. Lack of rain for several years
    - b. Dumping of garbage in the pits
    - c. Chemical mixed industrial effluents
  9. The places around big industries are likely to
    - a. Suffer due to lack of drinking water
    - b. Gain employment opportunities
    - c. Improvement in lifestyle of the people
  10. I insist in all occasions that the toxic gases escaping from the industries should be stopped; otherwise:
    - a. Living beings are affected
    - b. Rainfall will decrease
    - c. Agriculture will be greatly affected
  11. The most dramatic change occurring during landslides caused by earthquake is:
    - a. Human beings are burried alive
    - b. Dense forests are destroyed
    - c. The course of a river or a valley gets completely change
  12. The common reason for the occurrence of a tsunami is:
    - a. Eruption of volcano under the sea
    - b. Occurrence of earthquake under the sea
    - c. Overflowing of sea due to the fall of meteoroids
  13. When tsunami warning is issued, the First thing to do is:
    - a. Trying to protect the valuables of the house
    - b. Each member at home should get prepared individually with food, water, first aid, torch light, rain coat, etc
    - c. To inform the family members and friends in other places about the warning
  14. I don't like waste and dirty things strewn around my house
    - a. When they decay, they produce bad smell
    - b. The beauty of the house is lost
    - c. People will be hesitant to come to my house
  15. I object to the act of allowing the dirty waste water from houses flowing on the street
    - a. Difficult for the people to cross the way
    - b. When vehicles come, the dirty water is splashed on the people
    - c. Stagnant water in ditches become breeding spots for mosquitoes
  16. After the attack of tsunami, the First thing to do by the relief squad is:
    - a. To take the affected ones to the relief camps
    - b. To supply food and water to the affected in the same spot
    - c. To make arrangement for immediate supply of food and first aid in the relief camps
  17. The major reason for the occurrence of earthquake:
    - a. The movement of the tectonic plates to get adjusted
    - b. The impact of volcano
    - c. Digging of deep oil wells and coal mines.
  18. The storm of the stage five, lashes at the speed of:
    - a. 150 miles and above per hour
    - b. 100 to 150 miles per hour
    - c. 50 to 70 miles per hour
  19. The sea level keeps on increasing because:

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- a. Heavy rain pour
  - b. Increase in the density of sea water
  - c. Melting of snow in polar region
  20. The major cause for depletion of ground water
    - a. Erection of factories preparing bottled waters
    - b. Large wastage of water
    - c. Inadequate rainwater harvesting
  21. I worry when I happen to see the drinking water pipes broken and water splashing out from them.
    - a. Water may get mixed with pollutants
    - b. Food cooked in this water may not be tasty
    - c. It may cause diarrhea viral fevers, etc
  22. When we drink boiled water
    - a. Intestine gets cleaned
    - b. Disease causing microbes are destroyed
    - c. Body gets strengthened
  23. In order to avoid see water or toxic one getting seeped into the areas where ground water is largely sucked out, the taking out of ground water should be minimized, or else
    - a. Ground water becomes unfit for drinking
    - b. Ground water gets exhausted
    - c. The land becomes barren
  24. Melting of snow mountains is mainly due to:
    - a. Increase in the temperature of air in the atmosphere
    - b. Occurrence of earthquake close to sea coast
    - c. Testing of atomic bombs
  25. As the tsunami travels under the sea faster than a jet plane:
    - a. Sea coast gets largely damaged
    - b. Ships sailing in the sea get broken
    - c. Sea becomes turbulent
  26. The major reason for the formation of storm:
    - a. Heavy rains
    - b. The rushing of air towards the low depression area
    - c. The rotation of the earth
  27. Soon after the fourth level cyclone warning, the First thing to do is:
    - a. Switching off gas and electrical connection
    - b. Staying in the safest part of the house under the cover of pillows and mattresses
    - c. Not going out of the house
  28. When I see drinking water flowing out of broken pipes:
    - a. I will try to stop it immediately
    - b. I don't worry about this, because it is the duty of the concerned officers to rectify it
    - c. As it is a usual occurrence I don't bother about it
  29. Water taken from canals, ponds, and tanks nearby is:
    - a. Useful for cooking
    - b. Good for drinking
    - c. Helpful for cleaning the house
  30. The steady rising of temperature of air in the atmosphere is mainly due to:
    - a. Depletion in ozone layer
    - b. Excessive sun heat
    - c. Rockets being sent to space for research
  31. The insecticides used for eradicating mosquitoes and other insects are to be abolished. Because

- a. Ground water gets poisoned
- b. The foodstuffs become tasteless
- c. No change in the ground water
32. The major cause for damages during a cyclone is:
  - a. The turbulence of the sea
  - b. Floods caused by the rain
  - c. The speed of the wind
33. I strongly object to the practice of dumping waste of a locality near housing colonies. Because:
  - a. When the waste are burnt the air gets polluted
  - b. Pigs and dogs roaming around the dumping pit are a great disturbance to the people
  - c. When wind blows the dirty waste are scattered all over the colony
34. To save the coastal line from much destruction due to sever cyclone:
  - a. Preventing people from forming living colonies on the coastal line
  - b. Building ramparts on the sea shore to prevent the sea water entering into habitations
  - c. Mangrove forest to be developed on the sea shore
35. I oppose the act of taking sand from the river or tanks nearby. Because
  - a. Lorries carrying sand cause accidents
  - b. Unnecessary quarrels arise between those opposing sand mining and those supporting the act
  - c. Ground water goes down in places around tanks and rivers

The distribution of test items under the 7 dimensions is given in Table 1.

**Table 1**  
**Items of the Environmental Awareness Scale – Dimension wise**

S.N	Dimension	Item no
1	<b>Water Pollution</b>	1, 8, 21, 22, 29, 31
2	<b>Depletion of Ground water</b>	2, 9, 20, 23,
3	<b>Air Pollution</b>	3, 10, 19, 24, 30
4	<b>Destruction by Natural Forces</b>	4, 11, 18, 25, 32
5	<b>Causes for Natural Calamities</b>	5, 12, 17, 26,
6	<b>Means of Safeguarding Life</b>	6, 13, 16, 27, 34
7	<b>Health Consciousness</b>	7, 14, 15, 28, 33, 35

### Scoring Scheme

The Table 2 furnishes the answer for each item of the tool. Each test item is furnished with three distracters (A), (B), (C), the right answer fetches one score and the wrong answer earns only zero. Therefore, a respondent is likely to score a minimum of 0 and maximum of 35.

**Table 2**  
**Scoring scheme of Environmental Awareness Scale**

S.No	Answer	S.No	Answer	S.No	Answer
1	B	14	A	27	B
2	B	15	C	28	A
3	A	16	B	29	B
4	B	17	A	30	A
5	C	18	A	31	A
6	C	19	C	32	B
7	B	20	A	33	A
8	C	21	C	34	C

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9	A	22	B	35	C
10	A	23	C		
11	C	24	A		
12	B	25	A		
13	B	26	B		

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