

SMART WATERS: SOWING AWARENESS, HARVESTING FUTURE



By Priscila Baño

INTRODUCTION



Ecuador is a country committed to the global sustainable development agenda, understanding the urgency and importance of implementing habits that ensure a prosperous and equitable future for all its citizens. Ecuador became part of the international community to change our world until 2030, when the 17 Sustainable Development Goals were adopted in 2015.

INTRODUCTION

SDG 6 places strong emphasis on the need to 'Ensure availability and sustainable management of water and sanitation for all'.

Focusing on the needs of those in vulnerable circumstances, the goal emphasizes the need to provide clean water and adequate sanitation services to all people in an equal and universal manner.

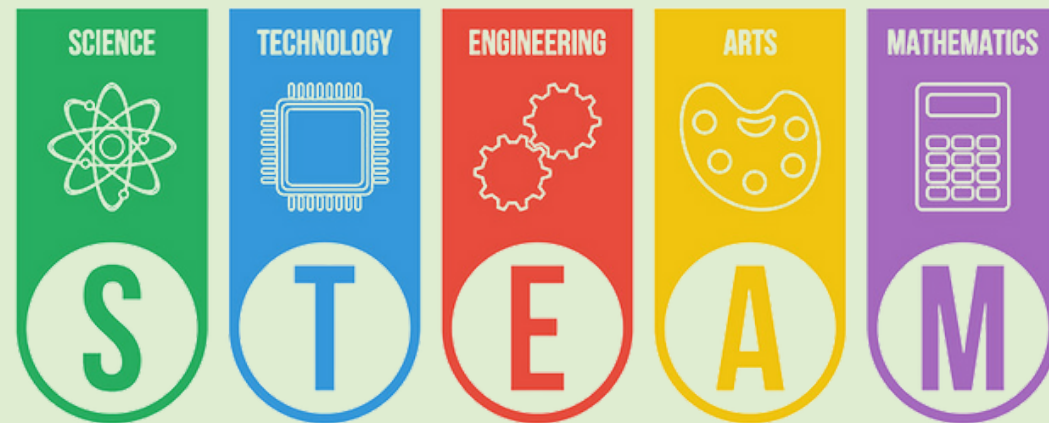


INTRODUCTION



This proposal outlines a **novel strategy** that aims to address these critical inequalities, based on **education** as a fundamental pillar for change. The proposal suggests the use of STEAM **methodologies** in Ecuadorian rural schools to improve **access to water** and sanitation and raise awareness of their importance. This project presents a practical and creative approach where children can actively solve real water-related problems.

The project investigates the use of **STEAM** education as a vital catalyst to achieve the SDGs, representing a fruitful and feasible opportunity to bring about changes in rural communities in Ecuador.



EDUCATION



Image obtained from UNICEF ECUADOR 2022

INTRODUCTION

Despite significant progress, **difficulties** still exist, particularly in **rural communities** in Ecuador. In 2016, 85.9 percent had access to **basic sanitation**, while 70.1 percent of the population had safe water management. However, only 55.55 percent of Ecuadorians have access to basic handwashing and sanitation services. With 48.1 percent of children under 18 lacking access to these basic services, coverage for **children and adolescents** in rural areas is more limited. This means that over 2.6 million children lack access to clean water, sanitation, and good hygiene.

CHALLENGES IDENTIFIED

ACCESS TO SAFE WATER, SANITATION AND HYGIENE IN ECUADOR



- While 65.6 percent in urban areas have simultaneous access to ASH, only 36.4 percent of the rural population do. This implies a significant disparity in the availability of basic services, highlighting inequalities between urban and rural areas.
- 8 out of 10 indigenous children do not have simultaneous access to basic sanitation, hygiene products, and safe water. Where their health and well-being are severely affected by this lack of access.

CHALLENGES IDENTIFIED

IMPACT ON CHILD HEALTH

- As a direct result of not having access to safe water and sanitation, **diarrheal diseases** rank second among the causes of death for children under five in underdeveloped countries. Due to these health problems, 48% of indigenous children in Ecuador and 25% of all children suffer from chronic malnutrition.
- Inadequate ASH services have an impact on children's **cognitive** and educational **development**, as well as their health.
- **Testimony:** Rosa Lanchimba, a resident of Pisambilla, Imbabura, represents this reality by stating that she boils the water before giving it to her children out of concern for contamination and its effects. This preventive precaution was taken after her youngest son was diagnosed with **chronic child malnutrition**. Her experience serves as an example of the struggles that families face every day and the survival measures they must take when they cannot access basic WASH services.



Image obtained from UNICEF ECUADOR 2022

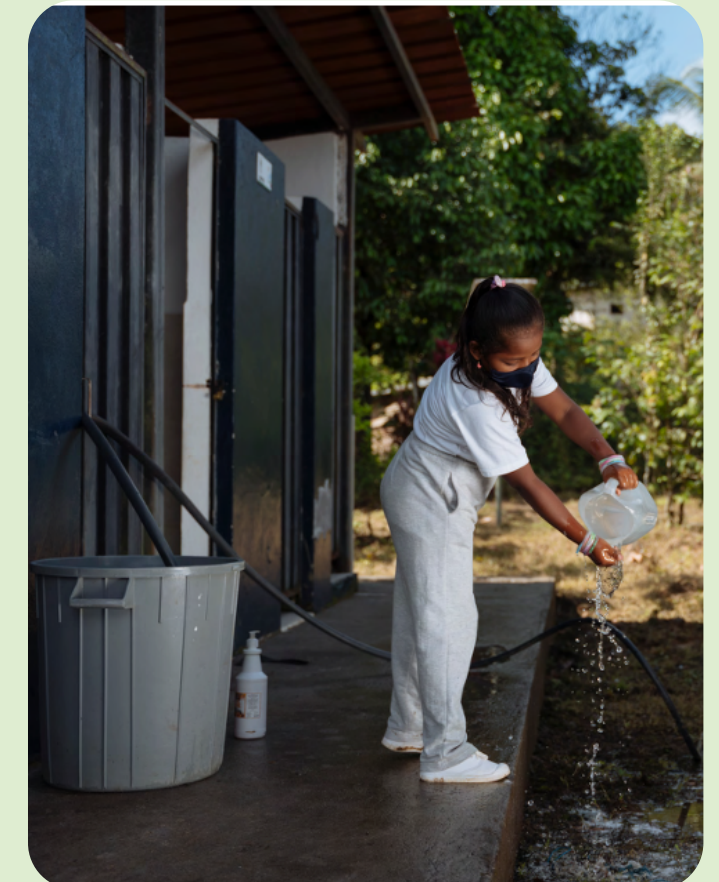


Image obtained from UNICEF ECUADOR

OPPORTUNITIES

ALIGNMENT WITH PREVENTIVE MEDICINE

The **Ten-Year Plan** of the Ministry of Public Health 2021-2031 objective 3 highlights **preventive medicine** as an essential foundation for reducing preventable diseases and avoidable deaths, leading towards a healthier and more sustainable perspective in healthcare in Ecuador. This objective aligns with our proposal to strengthen **child health**, emphasizing the importance of adopting a preventive approach, incorporating STEAM education in schools in rural areas. This shared vision underscores the urgent need to act now to prevent diseases, using education as a tool for transforming public health from the ground up, ensuring a healthier future for children and society.



CHALLENGES IDENTIFIED

EDUCATIONAL CONSEQUENCES:

Unhygienic conditions in rural schools have a detrimental effect on the level of education and student attendance, restricting children's learning and growth opportunities.

The highest rates of absenteeism are attributed to **illnesses and infections** that are often caused by unhealthy conditions and poor water quality.

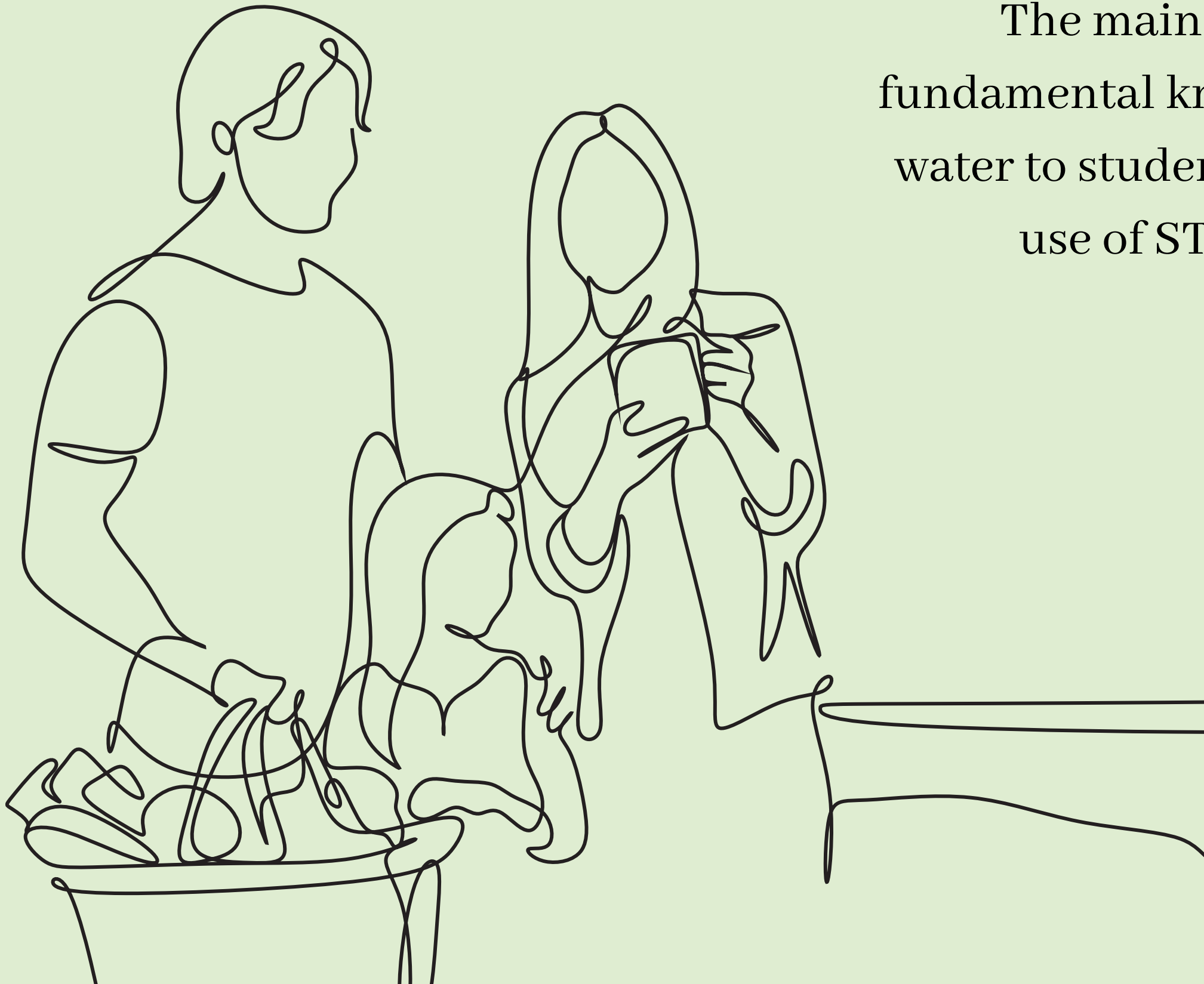


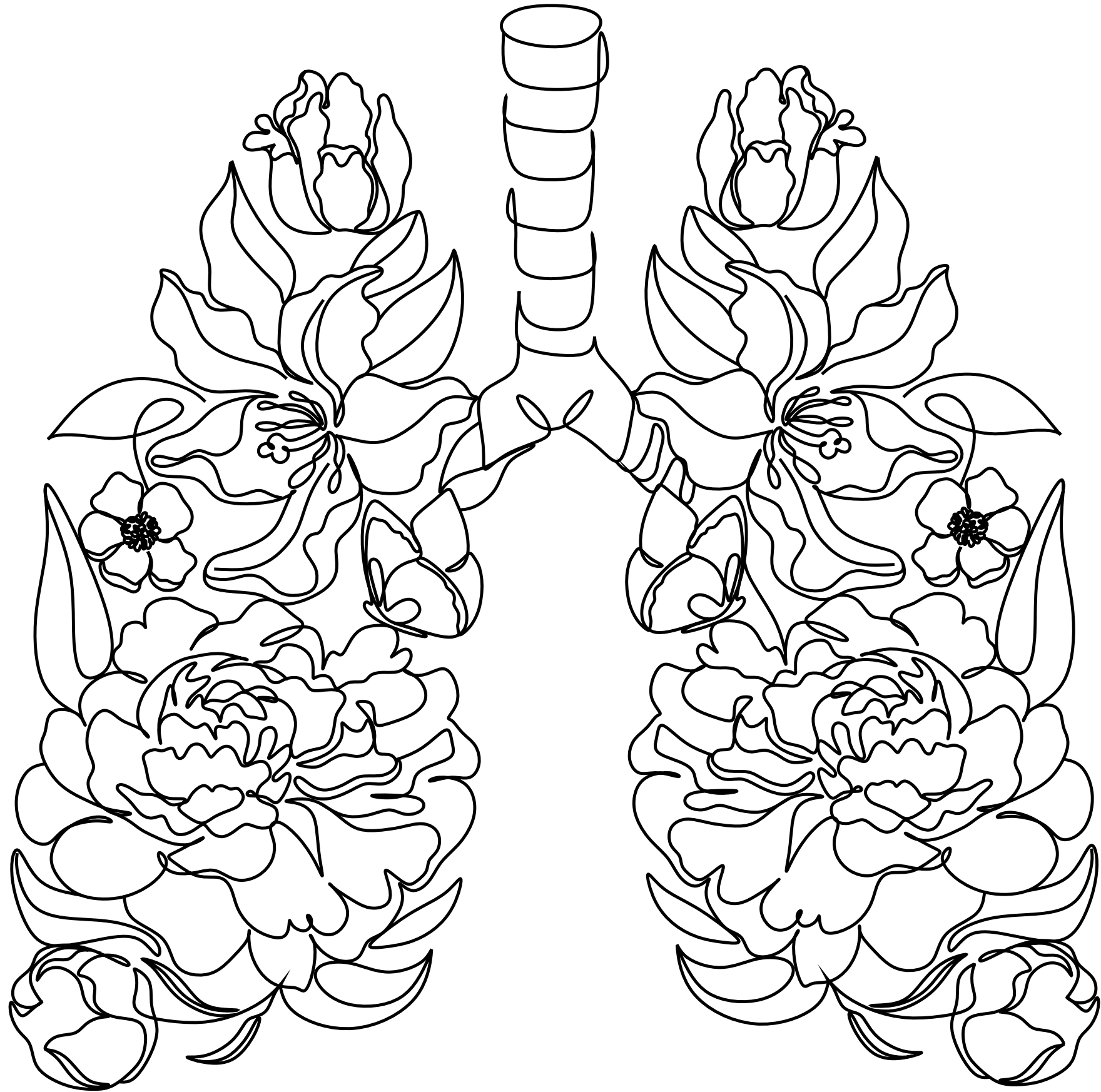
One of the biggest challenges for ongoing education in rural schools, especially for girls, is the lack of adequate sanitation and clean water facilities. Regular attendance at school can be a challenge and can lead to **dropout** due to issues such as having to travel long distances to get water or the lack of privacy and safety in bathrooms.

PROJECT PROPOSAL

WATER LITERACY THROUGH STEAM

The main objective of the program is to provide fundamental knowledge about the use and management of water to students in rural schools in Ecuador through the use of STEAM-based teaching methodologies.





PROJECT OBJECTIVES

- Enhancing water and sanitation management in rural schools through the inclusion of STEAM education.
- Analyzing and improving water consumption.
- Implement water reuse systems and promote greater awareness of the importance of sanitation and water.

WATER LITERACY THROUGH STEAM

INTERACTIVE LEARNING ACTIVITIES

Educational Digestive Systems:

This technique compares a healthy digestive system with one that is affected by the use of non-potable water to illustrate the effects of this non-potable water on human health.



IMAGE OBTAINED FROM AMAZON



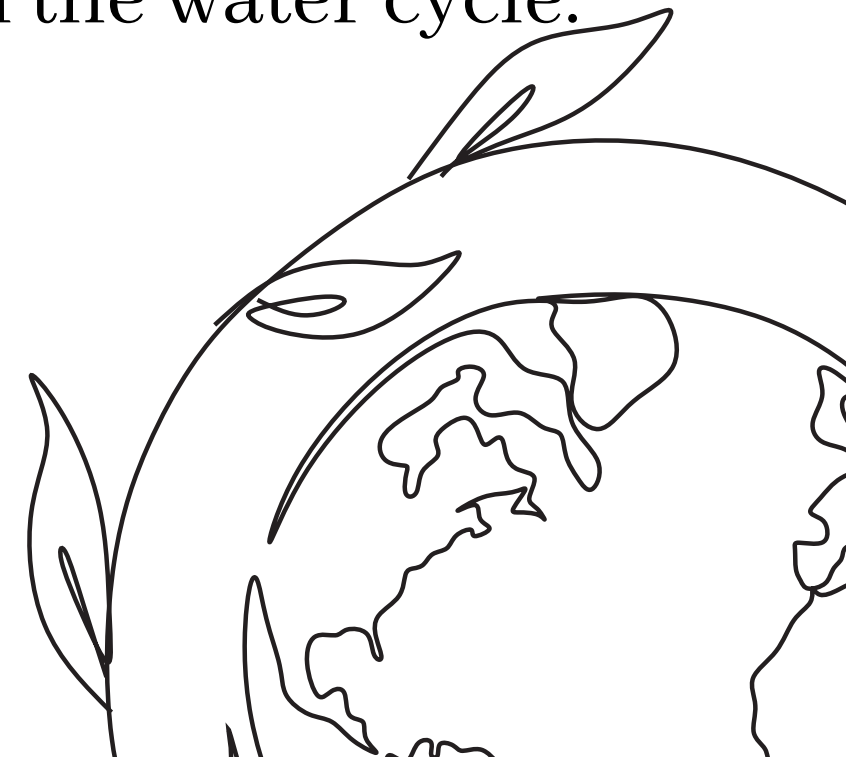
WATER LITERACY THROUGH STEAM

INTERACTIVE LEARNING ACTIVITIES



Image obtained from Environmental Protection Agency

1. **Online Games:** Students can learn about water efficiency and develop conservation practices by playing interactive educational games like WaterSense.
2. **Puzzles and Word Games:** Creating word searches, riddles, and riddles to engage children in the study of sustainability principles and the water cycle.



WATER LITERACY THROUGH STEAM

WATER CONSERVATION KIT

Indoor kit:



- High-efficiency shower head that regulates water flow to 1.5 gallons per minute.
- Faucet aerators
- 5-minute shower timer

Outdoor Kit:

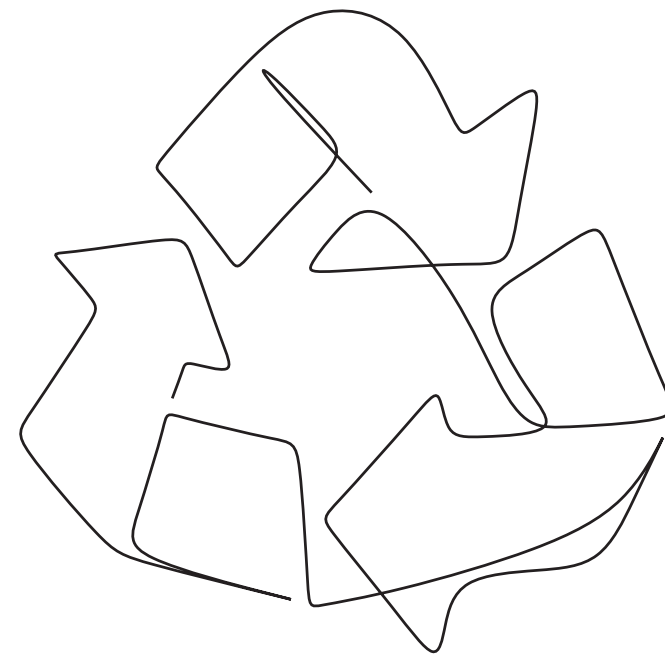
- Water meter to measure the amount of water irrigated
- Hose nozzle to prevent water waste.
- Moisture sensor to determine how much water is needed.



GOALS

ANALYSIS OF WATER CONSUMPTION

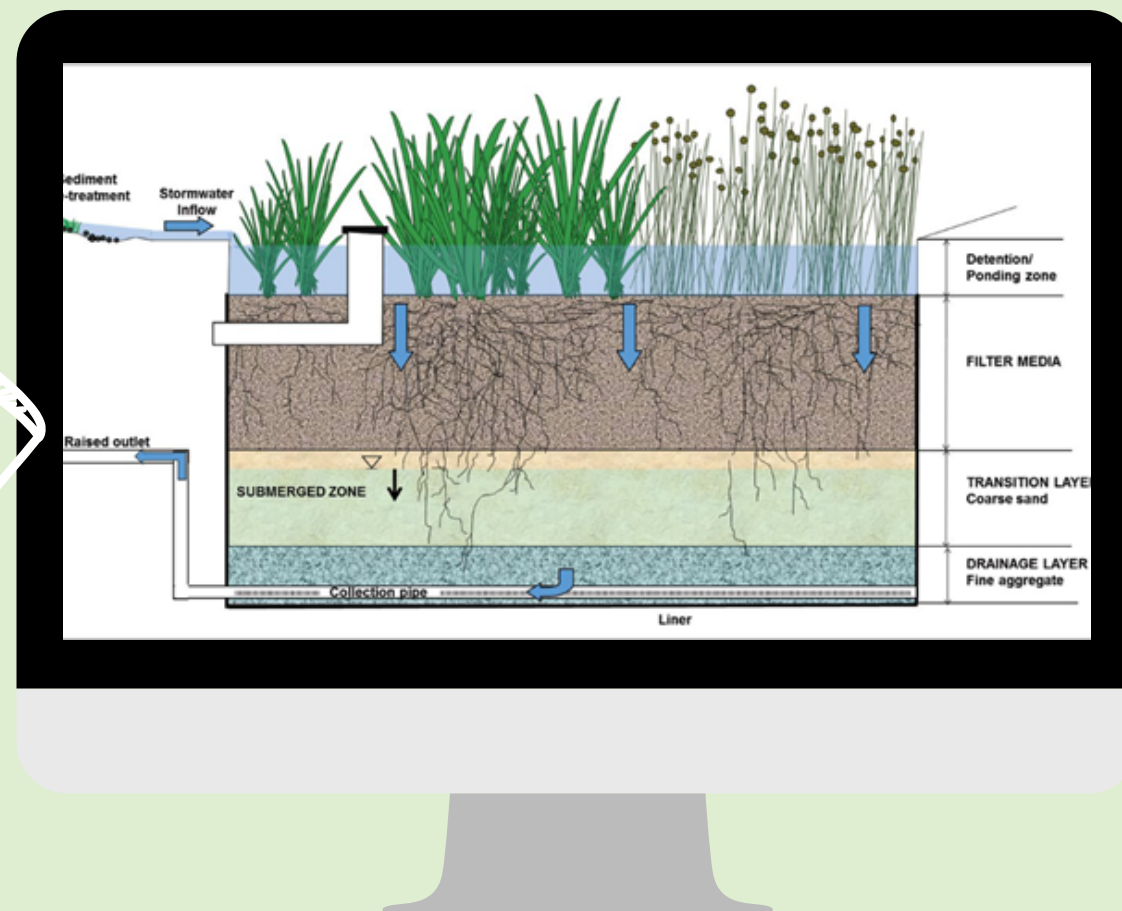
Installation of water flow sensors to monitor and analyze water consumption in educational institutions, allowing for the evaluation and optimization of water usage over time.



GOALS

REUSE OF WASHBASIN WATER

Biological Filtration System: Development of a two-stage filtration system that includes fat separation as an initial stage and then two filtration stages, which will consist of gravel, sand, and aquatic plants to purify the water from the sinks. Once these stages are completed, the purified water will be transported to the educational unit's garden.



EXPECTED IMPACT



- Significant improvement in students' **knowledge** and understanding of water and sanitation-related issues.
- **Reduction** of water-related diseases prevalence due to improved sanitation and hygiene practices.
- The school serves as an example of replicable sustainable practices for other communities.
- Direct support for the achievement of the United Nations Sustainable Development Goals, especially **SDG 6**, by ensuring the availability and sustainable management of water and sanitation for all, as well as **SDG 4**, by providing quality education.

SUSTAINABILITY AND FUTURE OF THE PROJECT

1. Providing ongoing STEAM education **programs** and water management training for educators and community leaders.
2. Establish a **monitoring and evaluation** system to collect information on the project impact.
3. **Create and share** comprehensive project documentation, which should include case studies, instruction manuals, and educational resources.
4. Design the project so that it can easily **adapt** to various situations and needs.



Image obtained from Food News LATAM

CALL TO ACTION



By using STEAM methods, this project offers a rare **opportunity** to significantly improve the lives of children attending rural schools in Ecuador, enhancing their **access to water** and education. The involvement of Ecuadorian citizens can make a significant difference.

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THANK YOU!

