IMPLEMENTATION OF THE OXYGEN ALMS PROGRAM THROUGH TREE PLANTING TO IMPROVE ENVIRONMENTAL QUALITY AND PUBLIC AWARENESS

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ABSTRACT Environmental issues such as air pollution, global warming, and flooding have become increasingl y complex at both global and local levels. These problems are largely driven by anthropogenic activities, including industrial emissions, transportation, and land-use changes, which contribute to declining air quality and increased greenhouse gas concentrations. This study aims to evaluate the effectiveness of the "Oxygen Charity" program through tree planting in improving environme ntal quality and public awareness. A mixed-methods approach was applied, combining quantitative and qualitative analyses. Data were collected through pre-test and post-test questionnaires, observations, interviews, and documentation. The results indicate a significant improvement in public knowledge and environmental awareness following program implementation. The average knowledge score increased from 2.75 to 4.25, while environmental awareness also showed substantial improveme nt. Community participation was high, with 75% of participants categorized as active to very active. In addition, tree planting contributes to environmental improvement through carbon sequestratio n, oxygen production, and flood risk reduction. In conclusion, the Oxygen Charity program is effective in enhancing environmental awareness and can serve as a sustainable community-based environmental management model.

KEYWORDS: *Community Participation; Environmental Awareness; Sustainability; Tree Planting; Oxygen Charity.*

1. INTRODUCTION

Global and local environmental issues are increasingly complex, particularly those related to rising air pollution, global warming, and increasingly frequent flooding. Anthropogenic activit ies such as motor vehicle emissions, industry, and land conversion have significantly contributed to declining air quality and increasing greenhouse gas concentrations in the atmosphere. This condition not only impacts human health but also accelerates climate change, characterized by rising global temperatures and unstable weather patterns. Furthermore, reduced vegetation cover exacerbates the risk of flooding due to the reduced ability of the soil to absorb and retain water.

In this context, trees play a crucial ecological role as a nature *-based solution* . Trees produce oxygen through photosynthesis, a vital process for living things. Furthermore, trees absorb carbon dioxide (CO_2), a major greenhouse gas contributing to global warming. Furthermore, trees improve air quality by filtering dust particles, smoke, and other harmful pollutants. Hydrologically, tree root systems help increase water infiltration into the soil, thereby reducing surface runoff and the risk of flooding.

With increasing awareness of the importance of environmental conservation, various innovative approaches that integrate social and ecological aspects have emerged, one of which is the concept of "Oxygen Alms." This concept defines tree planting as a form of social contribut ion that provides long-term benefits for the environment and human life. Through this approach, tree planting is seen not only as a conservation activity but also as an altruistic act that encourages broad community participation. Thus, "Oxygen Alms" is an effective strategy for increasing public awareness, involvement, and concrete action in maintaining environmental sustainability.

1.1. Formulation of the problem

1. How effective are education-based tree planting programs in increasing public understanding of the ecological benefits of trees, such as oxygen production, carbon dioxide (CO_2) absorption, and improving air quality?
2. To what extent can education-based tree planting programs increase public awareness and concern for environmental issues, particularly those related to air pollution, global warming, and flood mitigation?

1.2. Objective

1. Measuring the impact of the “Oxygen Alms” program on aspects of community knowledge, awareness, and behavior in protecting the environment, especially regarding the benefits of tree planting for air quality and climate change mitigation.
2. Analyzing the contribution of tree planting activities in the “Oxygen Charity” program to improving environmental quality, such as the potential for oxygen production, absorption of carbon dioxide (CO_2), and reducing the risk of flooding.
3. Increasing active community participation in greening activities through sustainab le educational and socio-ecological approaches.
4. Encouraging the formation of collective behavior in communities that care about the environment through the implementation of the “Oxygen Alms” concept as a communit y-based movement.

2. METHOD

2.1. Types and Approaches of Activities

This program uses a *mixed methods approach* with an applied design integrated with community service (PkM) . A quantitative approach is used to measure changes in community knowledge and awareness through structured instruments, while a qualitative approach is used to understand community perceptions, experiences, and levels of participation during program implementation. The integration of these two approaches aims to obtain a comprehensive picture of the effectiveness of the "Oxygen Charity" program.

2. 2. Location and Time

The program was implemented in Bogor, selected for its low vegetation cover and potential air quality issues. The program lasted three months, with 10 plantings being implemented in stages.

2. 3. Subjects and Sampling Techniques

The subjects consisted of local communities involved in the program, including farmer groups, youth, junior and senior high school students, and local residents. The sampling technique used was *purposive sampling* , selecting respondents based on criteria for active involvement in the activities. The number of respondents was adjusted to meet the analysis

needs.

2.4. Stages of Activity Implementation

The implementation of activities is carried out in stages as follows:

a. Preparation Stage

This includes an initial survey to identify environmental issues, coordination with partners (village government/community), and the development of educational materials based on the "Oxygen Charity" concept. This stage also involves determining planting locations and appropriate tree species.

b. Educational Stage

This is done through outreach and public education about the importance of trees in oxygen production, CO_2 absorption, air quality improvement, and flood mitigation. Methods used include interactive lectures, discussions, and visual media (posters/ *leaflet*).

c. Implementation Stage

The core activity is participatory tree planting by the community. This activity involves all participants to foster a sense of ownership and responsibility for the trees they plant.

d. Mentoring Stage

Post-planting support includes monitoring plant growth and continuing education on tree care. This support aims to ensure the program's sustainability.

e. Evaluation Stage

This is done to measure the success of the program by comparing conditions before and after the activity, both in terms of knowledge, awareness and community participation.

2.5. Data Collection Techniques

Data was collected through several methods, namely:

- *Questionnaire (pre-test and post-test)* to measure changes in public knowledge and awareness
- Observation to assess community participation and involvement
- Interviews to explore participants' perceptions and experiences

- Documentation to record the number of trees, activities, and field conditions

2.6. Research Variables and Indicators

a) Independent variable : "Oxygen Charity" program (education + tree planting)

b) Dependent variable :

- Community knowledge (understanding of the benefits of trees)
- Environmental awareness (attitude of caring for the environment)
- Community participation (level of involvement)

2.7. Data Analysis Techniques

- Quantitative analysis :
  - Paired *sample t-test* to see the difference before and after the program
  - Descriptive statistics (mean, percentage)

- Qualitative analysis **:**
  - Data reduction
  - Data presentation
  - Drawing conclusions

3. RESULTS AND DISCUSSION

3. **1.** General Overview of Program Implementation

The "Oxygen Alms" program was implemented in Bogor, involving **60 participants** from the community, youth, and farmer groups. Activities included environmental education and the planting of **150 tree seedlings** (mahogany, rain tree, and local fruit species).

3. 2. Results of Community Knowledge Measurement

Table 1. Changes in Knowledge Scores (Pre-test vs Post-test)

Knowledge Indicator	**Pre-test (Mean)**	**Post-test (Mean)**	**Δ (Difference)**
Benefits of trees as O_2 producers	2.8	4.3	+1.5
CO_2 absorption	2.6	4.2	+1.6
Air quality improvement	2.9	4.4	+1.5

Flood prevention	2.7	4.1	+1.4
Average	**2.75**	**4.25**	**+1.50**

There was a significant increase in public knowledge after participating in the educational program. This demonstrates that the educational approach in the "Oxygen Charity" program is effective in increasing public understanding.

3.3. Results of Environmental Awareness Measurement

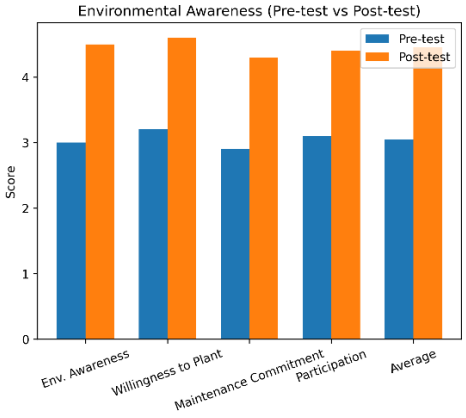

Figure 1. Changes in Environmental Awareness Scores

The program significantly increased community awareness and environmental awareness. The highest increase was seen in the willingness to plant trees indicator.

3.4. Level of Community Participation

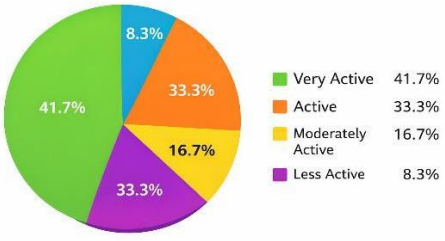

Figure 2 Activity Participation

The majority of the community (75%) is in the active to very active category. This indicates that the program's participatory approach is effective.

3.6. Discussion

The results of the activity show that the "Oxygen Charity" program is effective in significantly increasing public knowledge and awareness. This aligns with the concept of participatory environmental education , where direct involvement in activities (*learning by doing*) can strengthen understanding and change behavior.

The increase in knowledge scores from 2.75 to 4.25 indicates that the educational media used (posters, interactive outreach) effectively conveyed information. Furthermore, the increase in environmental awareness indicates that the program had not only a cognitive but also an affective impact.

In terms of participation, the high level of community involvement demonstrates that a social approach using the concept of "almsgiving" can foster intrinsic motivation. This is an advantage over *top-down approaches* , which are often less effective.

Ecologically, although the impacts may not be immediately felt, tree planting makes a significant long-term contribution to carbon sequestration, oxygen production, and flood risk reduction. These results are consistent with numerous studies that suggest communit y-based reforestation is an effective strategy for climate change mitigation.

However, several obstacles were encountered, such as limited land, suboptimal plant care, and reliance on initial mentoring. Therefore, sustainability strategies are needed, such as the formation of environmental awareness groups and long-term monitoring.

4. CONCLUSION

Based on the results of the program's activities and implementation, it can be concluded that the "Oxygen Charity" program has proven effective in raising public awareness of environme ntal issues **.** This is demonstrated by significant improvements in knowledge, attitudes, and communit y participation after participating in educational and tree-planting activities. This approach, which combines education with hands-on practice (*learning by doing*), is able to encourage more tangible behavioral changes than conventional outreach methods.

Furthermore, tree planting provides tangible ecological benefits , both in the short and long term. Planted trees contribute to improved air quality through oxygen production and carbon

dioxide (CO_2) absorption, and help improve environmental conditions such as reducing flood risk and increasing groundwater absorption. While the impact is gradual, this contribution is a crucial part of locally-based climate change mitigation efforts.

Furthermore, the "Oxygen Alms" concept has the potential to become a sustainable model for community service (PkM) **.** This approach not only emphasizes ecological aspects but also integrates social values that can increase community motivation and voluntary engagement. With its participatory, adaptive, and easily replicable nature, this model can be developed more broadly as a community empowerment strategy for sustainable environmental preservation.

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