

Abstract

Farming plays a crucial role in society by supplying food, generating employment, and driving economic growth. In countries like Thailand and Japan, agriculture is a major contributor to GDP and a significant source of jobs. However, the sector faces challenges such as climate change, soil degradation, and limited available land.

To highlight these challenges, we propose a game called "30 Days Harvest." In this game, players assume the role of a farmer tasked with managing and developing their farm to maximize profits from crop sales. Along the way, they must navigate obstacles like seasonal changes, temperature fluctuations, and space constraints.

Keywords: Farming Game, Global warming game, Strategy game

1. Introduction

30 Days Harvest is a single-player PC game designed to raise awareness about the environmental impacts on agriculture. Players step into the shoes of a farmer who must develop and manage their farm while navigating a range of environmental challenges, discovering strategies to overcome these obstacles and sustain their farm's success.

2. System overview

30 Days Harvest aims to raise awareness about the environmental impacts of global warming on farming. To achieve this, we have incorporated several environmental challenges into the game, including:

- **Environmental challenges:** To maximize crop production within the limited farming space, players must optimize environmental factors such as temperature, humidity, and air pollution levels to meet the specific needs of their crops. To do this, players must strategically plant specific types and quantities of trees within the same farming area. We believe that these strategies will help players gain a deeper understanding of the impact of global warming on agriculture.
- **Water Pollution:** Water is a critical factor in agriculture, and its quality greatly affects crop production. To highlight the importance of water quality, players are tasked with regularly collecting trash from the river to ensure a clean water supply for their farm.
- **Animal Invasion:** To add excitement to the gameplay, an animal invasion event is included. Players must protect their crops from insects and wild animals that threaten to eat or destroy them.

An example of a game screenshot is provided in Figure 1.



Figure 1: Example of 30 Days Harvest screenshot.

3. Experiments

We evaluated *30 Days Harvest* using nine male participants (average age 21.44 ± 0.53 years) based on three objectives: 1) raising awareness of environmental impacts on agriculture, 2) providing enjoyment, and 3) encouraging analytical thinking. Participants completed six days of gameplay and answered evaluation questions as follows:

- **Raising awareness of environmental impact:** After the gameplay, participants were asked to identify all environmental factors that influence crop production and explain how to manipulate these factors.
- **Providing enjoyment:** Participants were asked to rate their enjoyment on a scale from 1 to 5, where 1 means "dislike it" and 5 means "love it," in comparison to the baseline game, *HayDay*.
- **Encouraging analytical thinking:** We propose that achieving the highest production during gameplay requires analytical thinking. Therefore, the number of crop production of all participants is recorded.

4. Experimental results

The experimental results reveal that

- **Raising awareness of environmental impact:** 55.6% of participants identified two factors—humidity and temperature—while the rest correctly identified all three, including air pollution. Additionally, 88.9% knew how to manipulate these factors for optimal crop production.
- **Providing enjoyment:** While *30 Days Harvest* scored 3.44 ± 1.01 out of 5 in satisfaction, *Hay Day* scored 3.67 ± 1.12 . We suggest that the small margin between these scores indicates that our game is comparable to a well-known market leader.
- **Encouraging analytical thinking:** With a strategic plan, about 33.33% of participants were able to achieve maximum crop production.

5. Conclusion

30 Days Harvest is a farming game aimed at raising awareness of environmental impacts on agriculture. While it successfully raises awareness and provides enjoyment, it falls short in promoting analytical thinking, likely due to insufficient feedback on factors affecting crop production. We plan to address these issues to fully achieve all three objectives.