NTU CAECE Water Game Proposal
Development Team 2 – Water Distribution Game

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[Overview]

Introduction

As a city develops, or even countries, different types of industries spring and new challenges arise for the city authorities. Accessible water is not only a limited resource but is also unpredictable depending on several other factors. Factors include weather patterns, the geology, the topography, presence and distribution of vegetation and many more. These external factors dictate the inflow of water into a settlement and water authorities have the responsibility to distribute water in a fair and transparent manner to each industry.

Game teaching objectives:

1. Understanding how that water resources are limited.
2. Understanding how to find balance in meeting water needs from all industries (E.g. Domestic, Agriculture, and Industrial).
3. Understanding different industries generate different incomes.
4. Understanding the importance the social dimension through the Happy Index.
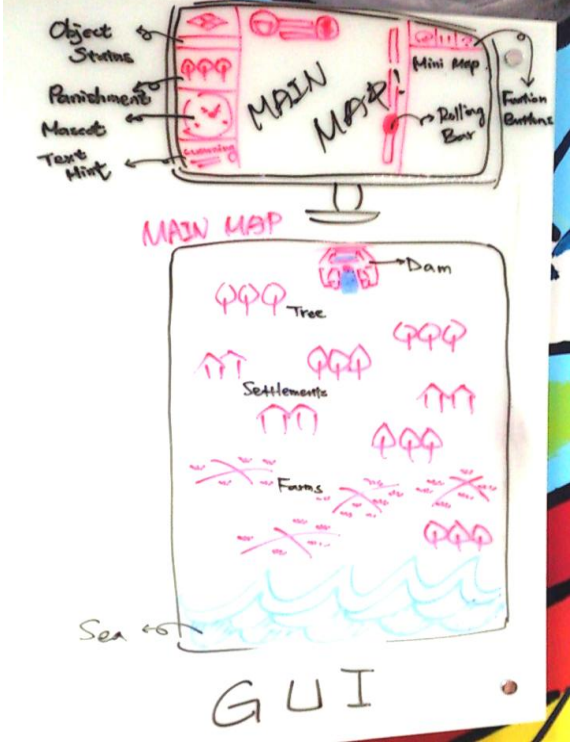
[Gameplay]

Game world introduction

Dr. CCWater grows up in Village Water-Wood. He is now the leader of water authority in his village. His job is to distribute water fairly for everyone in town. However with the town develops, this job becomes more and more difficult considering the economic profits. Therefore, the player is asked to help Dr. CCWater to do a good job for water distribution task given every stage.

Brief description

The objective is to distribute water to the agricultural fields, settlements and factories, as shown on the map, and to satisfy all sectors if possible until the water runs out. The player must be aware of the town's water usage while collecting money from agricultural fields and/or factories to further develop the town.

UI design

Left		Right
Timer: displaying how much time have passed		**Function Buttons:** replay, stop, start, help buttons, pause and resume
Infrastructure Status: displaying the degree of completion of objects		
Penalty: penalty will be given after the quota of trees allowed to be cut down has been surpassed		**Mini Map:** shows the whole map and current location in the map
Mascot: displaying Dr. CCWater's emotion		
Text Hint: gives out warnings, advice or trivial knowledge that may be useful		
Left	*Fig. 1 – UI design ver.2*	**Right**

Layer above main map	
Happy Index	displaying bar of happiness points
Coins	displaying bar of coins earned
Rolling Bar	a bar for rolling the map

How the game works

In the first stage, the game model will represent a less developed nation. As the game progresses, the model will transition into a more developed nation.

1. How the Points Count

The Happy Index bar increases by one unit for every 2 pts, and for every coin, 1 pt is given.

◆ **Happy Index (HI)**

If the infrastructure is full of water then happy index will increase.

◆ **Coins**

Money is earned if the infrastructure receives enough water for production.

type	quantity of water needed	when full of water(action taken every 2 seconds)	loss
agriculture field	10 quantities	+10 coins +10 happy index	-50 happy index
settlement	10 quantities	+20 happy index	-100 happy index
factory	-1 happy index 10 quantities	+100 coins -5 happy index	(none)
park	3 quantities	+7 happy index	-30 happy index
commercial building	7 quantities	+250 coins -10 happy index	(none)

◆ **Achievements**
The final score, at the end of every stage, is calculated using the table above as a guide. There will be different awards given (i.e. gold, silver, bronze); the player will receive the corresponding award depending on the final score and then receive a "Achievement Completed" message.

2. **Water needs of Infrastructures**
Shown on map are the objects the player needs to give out efficient water, where objects including agriculture fields, settlements, factories, parks, and commercial buildings.
Every drop indicates 10 quantities of water; the numbers of times for status changing depends on initial and terminal quantities of the object.

| type	initial quantities	terminal quantities
agriculture field	0	50
settlement	200	0
factory	0	350
park	100	0
commercial building	0	500

3. **Water supply Objects**
There will be some water supply objects on the map indicating different sources of water. These include but are not limited to dams, lakes and ponds.
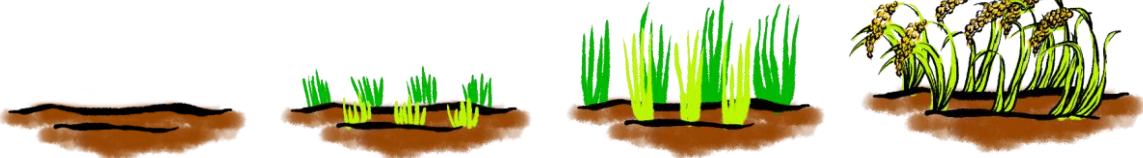
4. How to play

Use the mouse to draw a line from the water supply object to infrastructures that need water. The line indicates the watercourse, where the water will pass through.

[Icons]
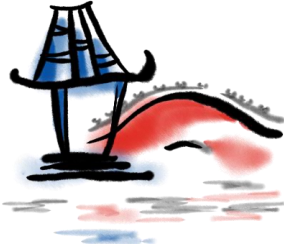
Settlement(s)   **Park**

Agricultural fields
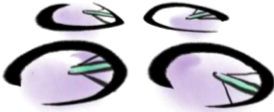
Dam   **Water processing plant**

Factory

Commercial building

Tree(s)

Attention

Death

Money

Happy points

Play

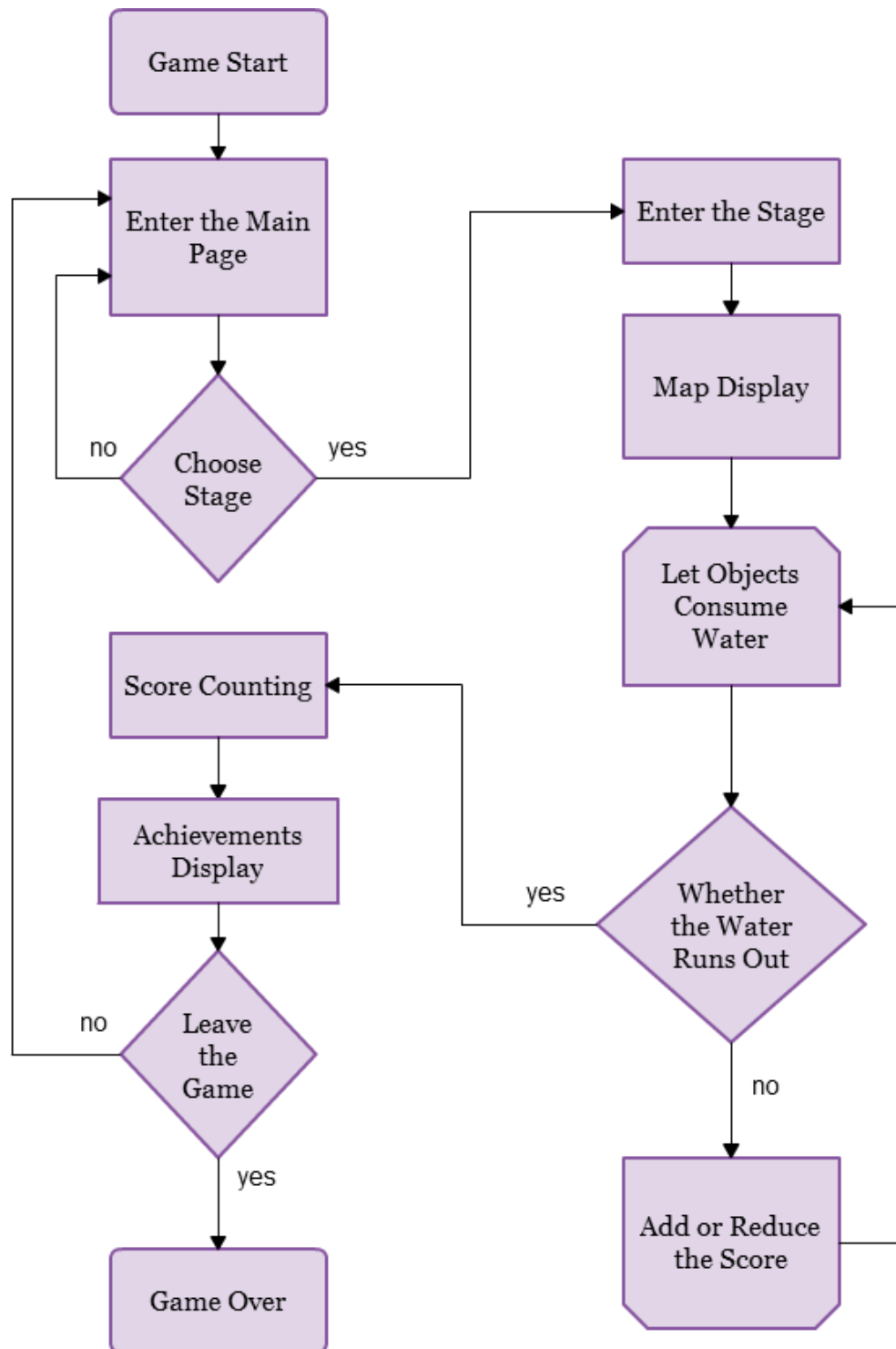**Pause**

Tools

Music On

Music Off

Game mascot：

Happy

Sad

[Tutorial Provided]
    Display the animation explaining how to play the fundamental stages.

[Flow Chart of Stages]

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┌─────────────────┐
│   Game Start    │
└─────────────────┘
         │
         ▼
┌─────────────────┐                        ┌─────────────────┐
│  Enter the Main │───────────────────────▶│ Enter the Stage │
│      Page       │                        └─────────────────┘
└─────────────────┘                                 │
         │                                          ▼
         ▼                                 ┌─────────────────┐
       ◇ Choose ◇    yes                   │   Map Display   │
   no  ◇ Stage  ◇ ──────────┐              └─────────────────┘
  ◀────◇        ◇           │                       │
       ◇        ◇           └──────────────────────▶│
                                                    ▼
                                           ┌─────────────────┐
                                           │   Let Objects   │◀──┐
                                           │     Consume     │   │
                                           │      Water      │   │
                                           └─────────────────┘   │
┌─────────────────┐                                 │            │
│ Score Counting  │◀──────────┐                      ▼            │
└─────────────────┘           │              ◇ Whether ◇         │
         │              yes   │              ◇ the Water ◇        │
         ▼              ┌──────│──────────◀──◇ Runs Out ◇         │
┌─────────────────┐     │                    ◇         ◇         │
│  Achievements   │     │                         │              │
│     Display     │     │                      no │              │
└─────────────────┘     │                         ▼              │
         │              │                 ┌─────────────────┐    │
         ▼              │                 │  Add or Reduce  │────┘
    ◇ Leave ◇           │                 │    the Score    │
 no ◇  the  ◇           │                 └─────────────────┘
◀───◇ Game  ◇           │
    ◇       ◇           │
         │              │
     yes │              │
         ▼              │
┌─────────────────┐     │
│   Game Over     │     │
└─────────────────┘     │
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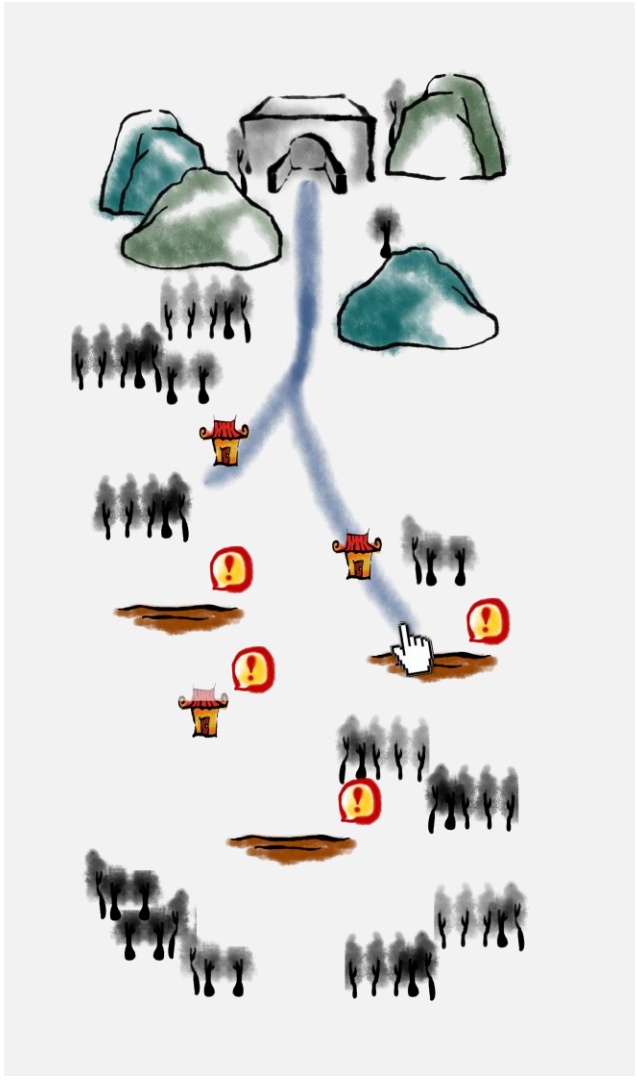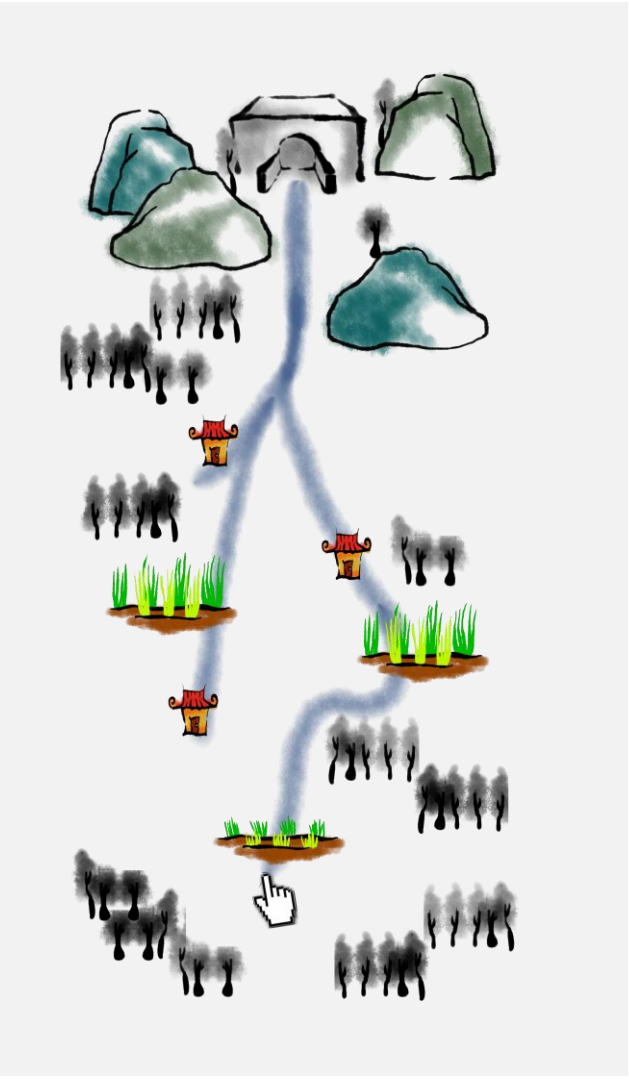
[Storyboard]

(1)
Initial state.

(2)
A warning mark will appear above infrastructures that lack water.

Player can use mouse to click and drag the path to concrete water channels from the dam.
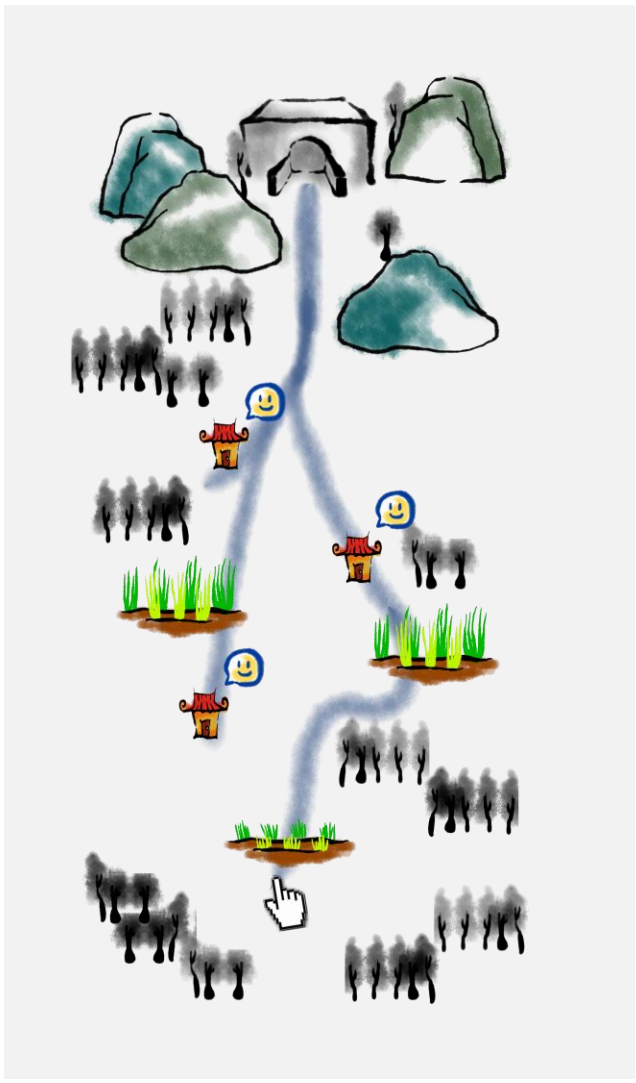
(3)
Player leads the water to the agriculture fields. Because these fields have water now, they won't show the warning mark.
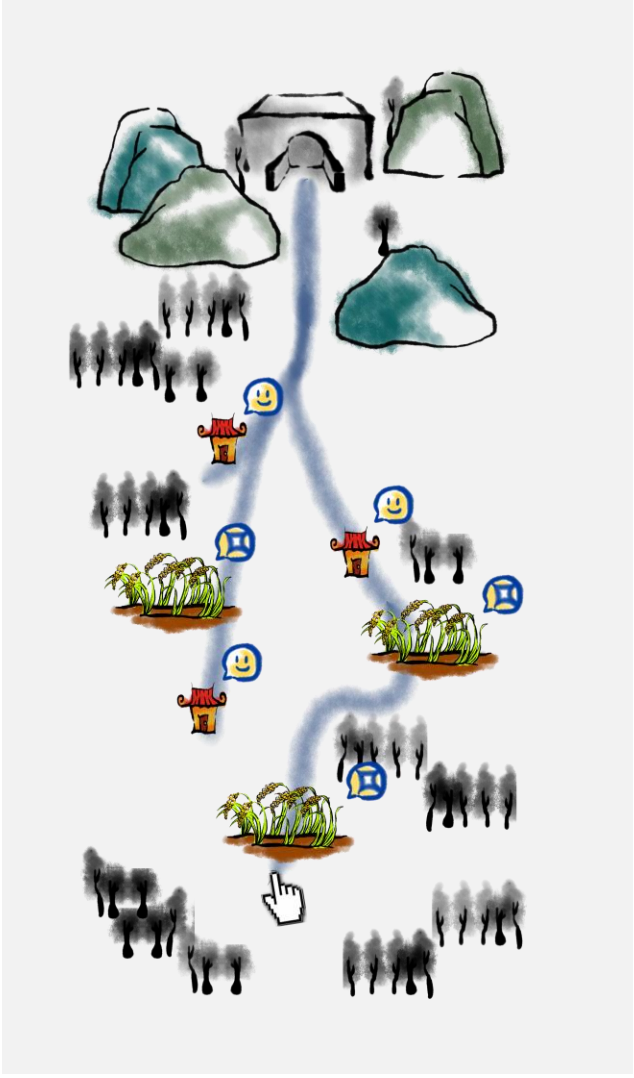
(4)
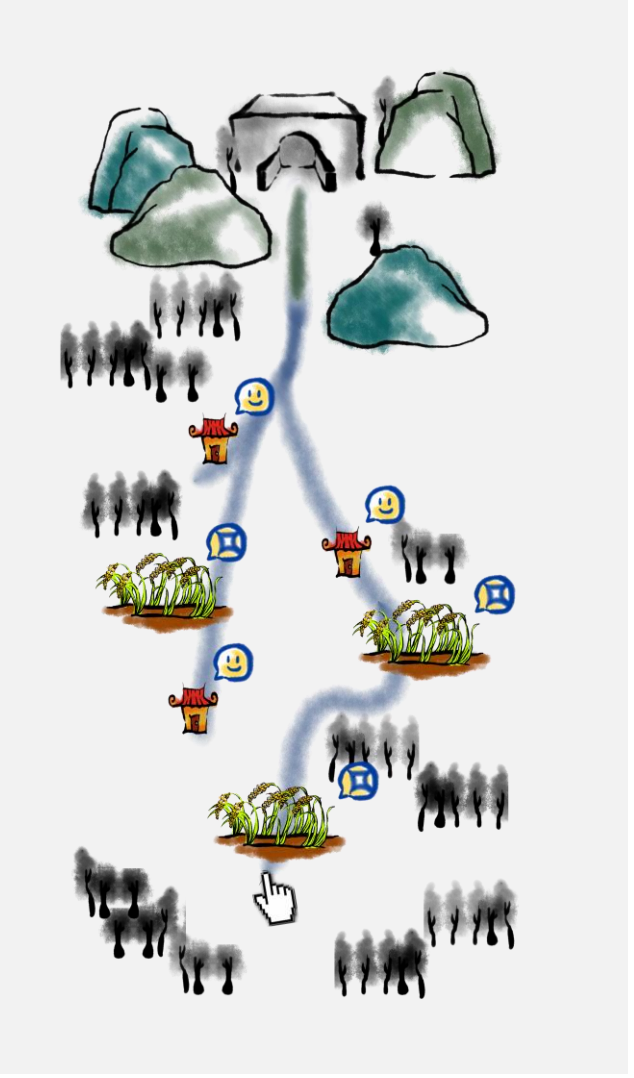Player leads the water into the settlements.

(5)
The settlements full of water will increase
the Happy Index, and the agriculture
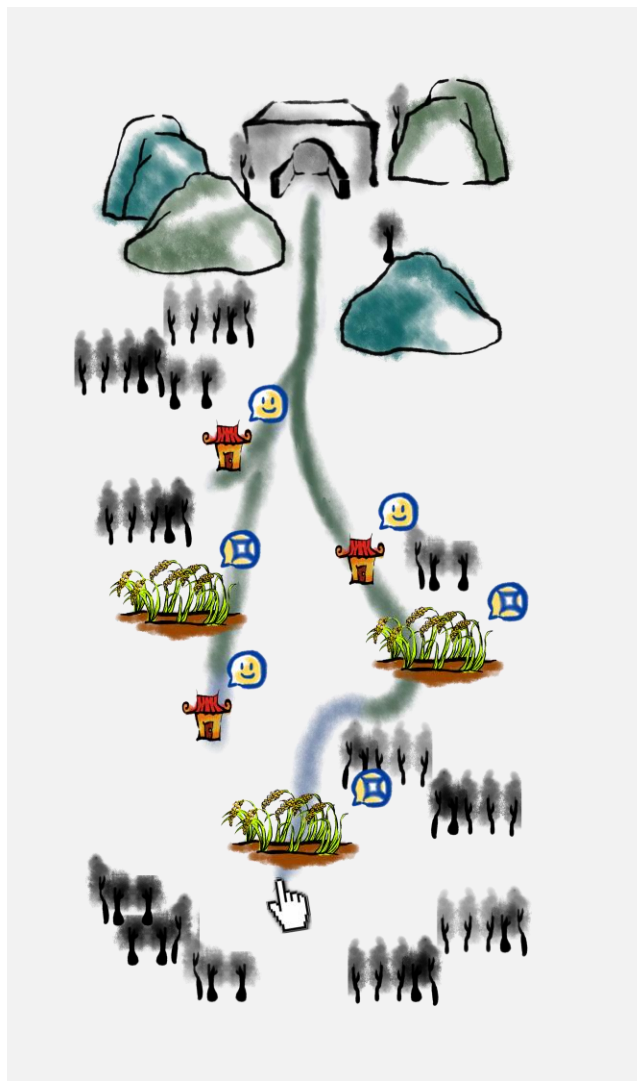fields will grow up the paddy.

(6)
When the agricultural fields are reaped,
coins can be earned.

(7) Water continues to flow from source to infrastructures.	(8) Water being slowly absorbed.

| (9) | (10)
The stage ends when water source(s) are completely consumed. |

[Reference for Similar App]

Where is my water? http://disney.go.com/wheresmywater/game.html