

AquaStress

Mitigation of Water Stress through new Approaches to Integrating Management, Technical, Economic and Institutional Instruments

Integrated Project

D4.4-5

Splash!

Users Guide

| | | |
|---|---|---------------------|
| Due date: | M48 | |
| Actual submission date: | M48 | |
| Start date of project: | 1-02-05 | Duration: 48 months |
| Deliverable Lead contractor: (Organisation name) | Alterra | |
| WP Participant(s) (Partner short names) | Alterra | |
| Author(s) in alphabetic order: | Arjan de Jong, Onno Roosenschoon | |
| Contact for queries: | Onno Roosenschoon onno.roosenschoon@wur.nl | |
| Dissemination Level | RE | |
| Deliverable Status: | Achieved | |

(1) (PU=Public, PP=Restricted to other Programmes Participants, RE=REstricted to a group specified by the consortium, CO=COntidential only for members of the consortium)

Abstract

This users guide describes Splash!, which aims to increase the awareness of different stakeholders in water stress mitigation processes by making it possible to play around with different simplified measures and options.

This document contains information, which is proprietary to the AQUASTRESS Consortium. Neither this document nor the information contained herein shall be used, duplicated or communicated by any means to any third party, in whole or in parts, except with prior written consent of the AQUASTRESS consortium.



The i³S Document Series

Splash!

For the I³S (Version 1.0)

AquaStress

Mitigation of Water Stress through new Approaches to Integrating Management, Technical,
Economic and Institutional Instruments

Contract FP6 511231

| | |
|------------------------|---|
| Title | Splash Game |
| Editor | Arjan de Jong, Onno Roosenschoon |
| Authors | Arjan de Jong, Onno Roosenschoon |
| Current version | V1.0 |
| Date | 30/04/2009 |
| Status | Final © Aquastress |
| Copyright | All methodologies, ideas and proposals in this document are the copyright of the Aquastress project participants. These methodologies, ideas and proposals may not be used to change or improve the specification of any project to which this document relates, to modify an existing project or to initiate a new project, without first obtaining written approval from those of the Aquastress participants who own the particular methodologies, ideas and proposals involved. |

Preface

Water resource management is an integral policy issue. Over the past fifty years policy making and water resource management has changed from a strictly technical issue to an issue involving society as a whole, with both urban and rural planning agencies and stakeholders.

Considering society as a subdomain, we address water resource management as the interaction of four subdomains: Society, Atmosphere, (Water on) Land, and (Open) Water.

Splash! attempts to capture and simulate these interactions between society and the physical environment. Society is represented by socio-economic sectors, such as industry, agriculture, and urban areas. In addition, different interest groups represent the values of these sectors and react to your actions.

This document is the manual of the Splash game. It explains the game itself, how it is played, and has background information explaining the game, the buttons and the internal formulas

Further information

Further information on the Aquastress project can be found on the project website: <http://www.aquastress.net>.

Contents

| | | |
|----------|--|-----------|
| 1 | Introduction and background..... | 11 |
| 1.1 | Learning goals of playing the Splash! game | 12 |
| 1.2 | Download and installation of the game | 12 |
| 2 | Start the game..... | 13 |
| 2.1 | Navigation, buttons and info bar..... | 15 |
| 3 | Start playing | 18 |
| 4 | Concluding remarks..... | 20 |

1 Introduction and background

Games and simulations are very closely related. In fact, a game could be thought of as a simulation that determines consequences of actions taken by one or more actors (players) within a simulated world. In other words, the actors become part of the simulation - the 'human factor'. Players are confronted with the results of their own and each others actions and can act upon them accordingly.

Games are useful for many reasons, including:

- Allowing decision makers to experiment in a safe and cost-effective manner
- Awareness building - the fact that playing games could also be 'fun', only strengthens this effect
- Support of knowledge transfer and letting novices understand complex theories and problems
- Providing insight in complex problems (even for experts - as sometimes the complexity is too difficult to comprehend)

Splash! is a game that attempts to capture and simulate water resource management as the interaction of four sub domains:

- Society
- Atmosphere
- (water on) land
- (open) water

Splash! has a SimCity style graphical user interface



Be aware of the fact that the maps used are a simplified version of the real-life situation. The same is valid for the effects of the undertaken measures

1.1 Learning goals of playing the Splash! game

You are responsible for the water management and spatial planning in a river basin. Do you want more agriculture for increasing food production? Or do you want to construct recreation areas to satisfy the urban population? Are you prepared for flooding events? Whatever you do, you will be critically followed by stakeholders and the government.

The government will supply you with a yearly budget to invest in flood protection, canals and groundwater wells. In the end, you will only be successful as water manager if both the different stakeholders and the government are satisfied with what you do and what you didn't do!

1.2 Download and installation of the game

The Splash! game can be downloaded from the <http://i3s.aquastress.net>. In the tools section, navigate to the Splash! pages. The download is available as a zip file. Extract the zip file in a directory of your choice. Go to the Runtime directory and double-click on splash.exe.

2 Start the game

The playing field of Splash consists of a number of tiles that schematically represent a landscape. When the game is launched, a river with the surrounding land is shown. The player has to divide this area by assigning housing, farming or industry to a certain area. When this is done, the game can start building; houses are built and populated, and farms and factories are built etcetera.

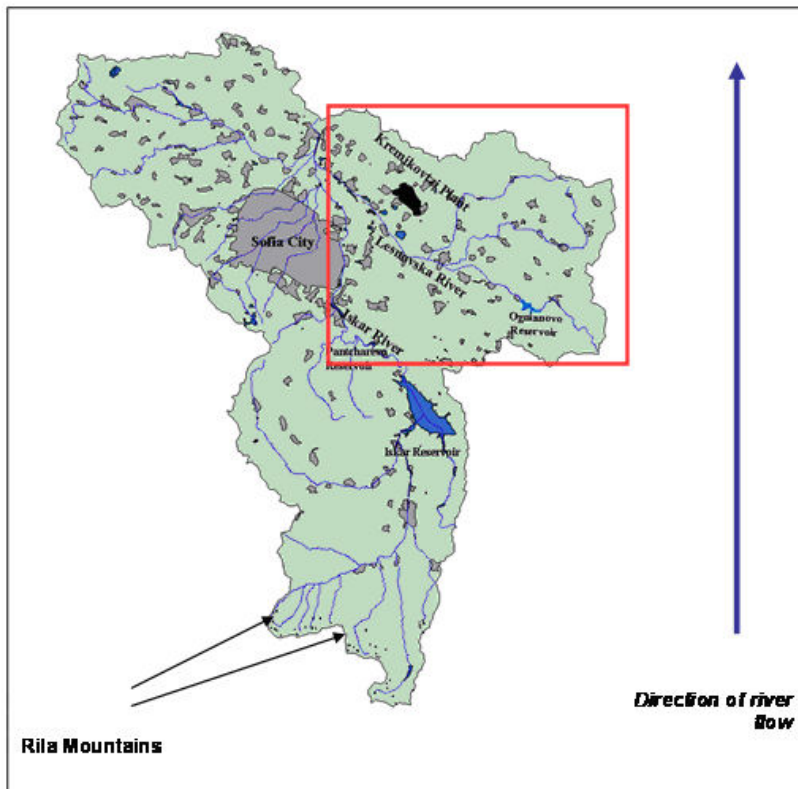


Figure 1: the Upper Iskar test site including the Iskar reservoir, Sofia city, and Kremikovtsi metallurgical plant

The current version is optimized for the Bulgaria Iskar-area. The system is described by making use of the currently available information for the Iskar case study. You are responsible for the water management and spatial planning in the Iskar river basin. Do you want more agriculture for increasing food production? Or do you want to construct recreation areas to satisfy the urban population? Are you prepared for flooding events? Whatever you do, you will be critically followed by stakeholders and the government.

The area within the red box in Figure 1 is the area which is used in Splash! in this manual.

When the splash.exe executable is double-clicked, the follow screen appears (Figure 2):

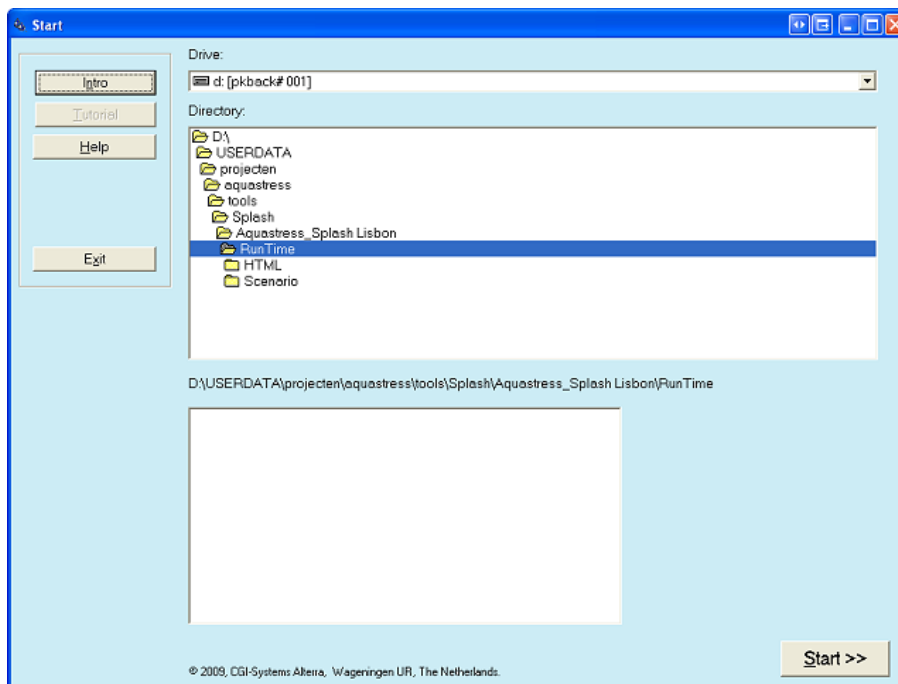


Figure 2: First screen after start-up

Double-clicking on Scenario shows a number of bmp files which represent the necessary source files for playing the game for the Iskar area (Figure 3).

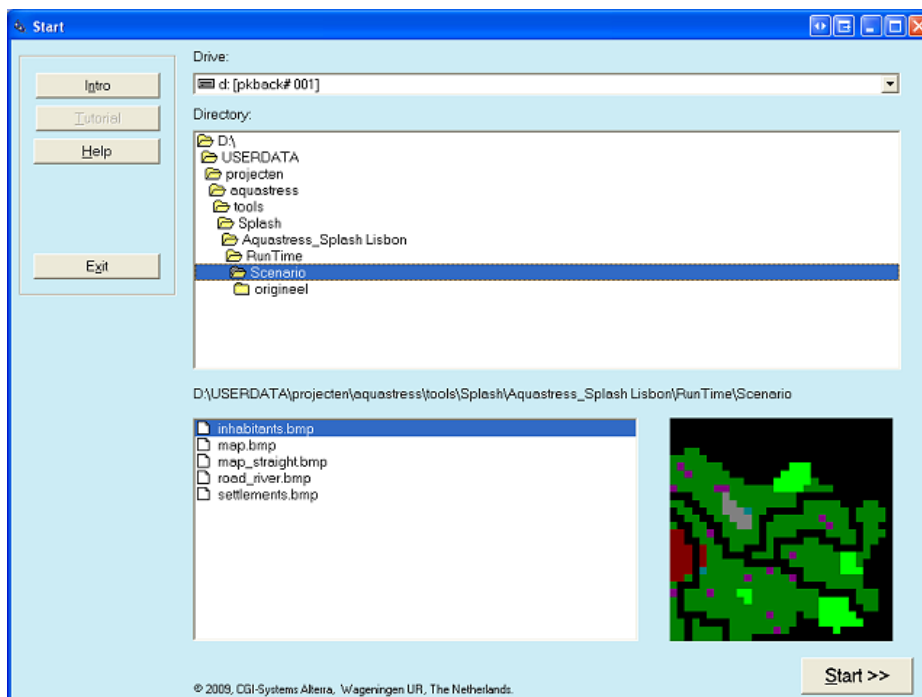


Figure 3: Loading a scenario

Press Start>>

The maps are loaded into the playing board which leads to the following screen (Figure 4):



Figure 4: Playing board

Part of the river basin is visible in the playing field. In the navigation window the complete river basin is visible. By choosing a location with the left mouse button, the playing field changes accordingly.

2.1 Navigation, buttons and info bar

We prepared the game in a way that the issues mentioned above appear on the playing field over time. To start the game press the Start button on the top right corner of the Splash application. Move the playing field to the left by clicking on the grey button which points to the left.

When the game is started, a number of other buttons becomes active (see Figure 5). Move the mouse cursor over the buttons to see a pop-up which display the function of the buttons. In the description of an actual case in chapter 3 the use of the buttons will be made clearer.

The buttons on the right give you more information on what is actually happening in the background. Pressing the help buttons shows the meaning of these symbols as well as the symbols in the bottom part of the screen.

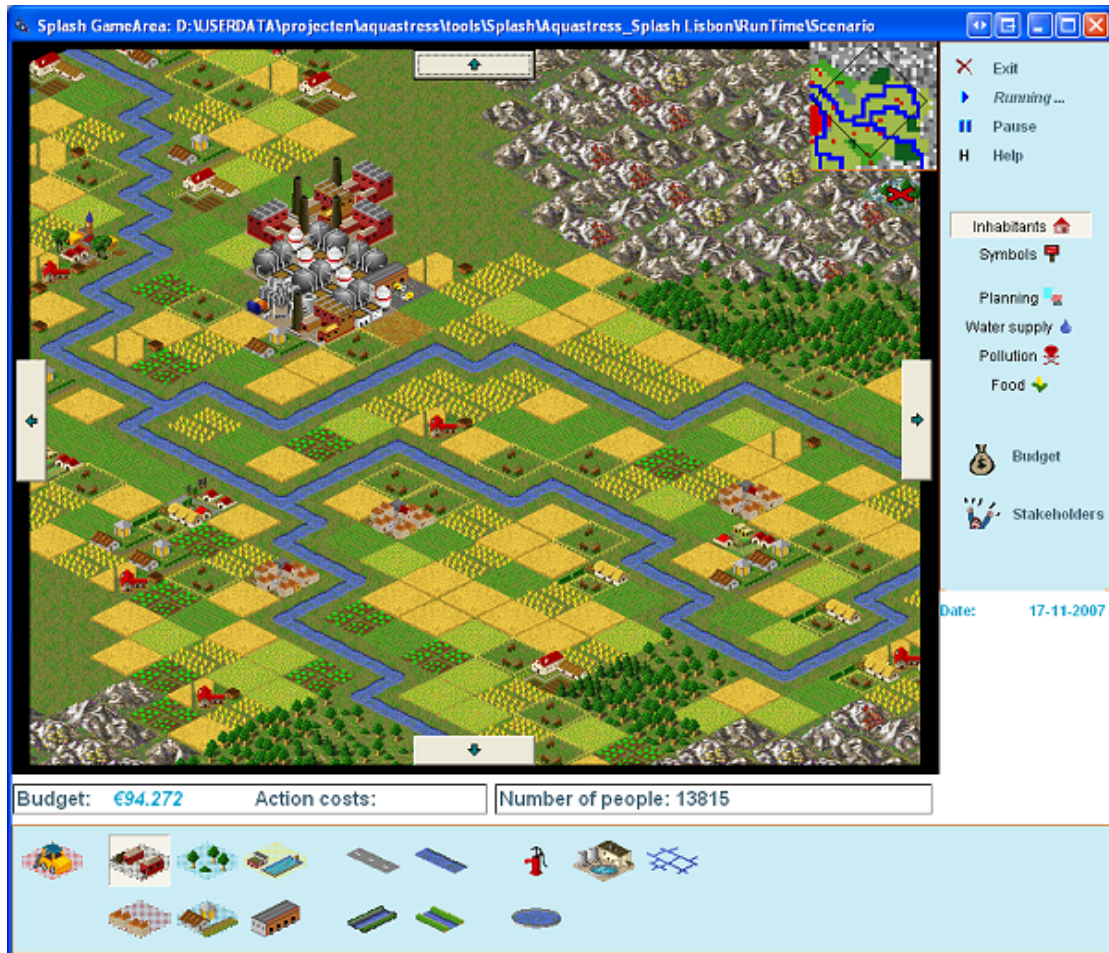


Figure 5: Playing board after starting the game

- Toggle button for land use, to be able to see the other properties (see below)
- Indicate problems (water shortage; environmental problems; food shortage)
- Zooming in and out (increasing and decreasing the size of the playing field)
- Inspection of the designation of the land
- Water availability for agriculture
- Drinking water supply for the population
- Food supply level
- Employment level
- Satisfaction of the population
- Pollution

An alternative way of viewing properties of a specific spot on the map is by clicking the right mouse button on that specific spot.

During the designation of land-use to certain tiles, you can check in the budget and score field, how much money it will cost. In case of insufficient budget, the operation is cancelled.

After changing the land use designation of a certain area, you have to wait and see whether the stakeholders are indeed following your designation. What they do depends on the circumstances of that area.

You have the following choices:

- Prepare land for Wildlife/Nature
- Prepare land for Farming/Agriculture
- Prepare land for Housing (urban)
- Prepare land for Industry
- Prepare land for Recreation
- Removing the present land use (required when you want to change the land use)

Again, the Help button show a screen in which some more explanation is given on the meaning of the symbols. You have the possibility to build:

- Water cleaning/purification installations
- Water reservoirs
- Food distribution centres (market)
- Irrigation systems for agriculture
- Water supply (pumps)
- Dikes for flood protection
- Canals
- Rivers
- Roads



Figure 6: Info bar

In the info bar (Figure 6) at the bottom of the playing board, you are informed about the available budget as well as the investment costs. More important however is the appreciation given by society for your efforts and accomplishments as water manager (right click on the map). If this bar is green, you are quite popular. If it becomes red, you better look for another job.

3 Start playing

What the game does and how it works can best be explained by actual playing it. In the following, by accomplishing some easy tasks, it will become clear what the game can do.

Please read carefully what should be done first. Do this by reading this whole chapter first. The sequence of the steps is important!

Task 1 – Try to recognize what is shown on the screen. What landmarks do you recognize?

There are a number of issues in the Iskar area. There has been water shortage and flooding and there are issues concerning pollution of rivers.

We prepared the game in a way that the issues mentioned above appear on the playing field over time. To start the game press the Start button on the top right corner of the Splash application. Move the playing field to the left by clicking on the grey button which points to the left

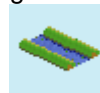
After you started the game, the game will automatically take steps in time (steps of 4 days) and things will happen. The Date field at the right will show how the date advances.

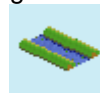
Task 2 - Let the game run automatically until June. You will see that while the game runs, the budget at the bottom left increases.

After some time, you'll see a flooding occur in the Sofia region. This causes a great deal of damage which will reflect on the available budget which decreases significantly.

Task 3 – Close the game by pressing the exit (red cross) button on the top right corner. Leave the window where we can choose a scenario intact. We should now make sure that no more flooding will take place. Do this by building dikes along the river where the flooding occurs. Open the playing field by choosing Start >> again.

In the playing field window, start the game again by clicking on the Start button in the top right



corner. Build dikes in the Sofia area. The icon to use is . Activate the dike building tool and build dikes alongside the river.

Let the game run until June again. There will be no flooding and no damage. Building dikes has costed you money, but less than flooding would have costed you.

Task 4 – We have no flooding anymore so we can concentrate on other things. Let's have a look at pollution. Where will the polluted areas be found, you think?

To check if your guess is right, click on the Pollution layer button at the right. What do you see, was your guess right?

Now we are going to do something about pollution. If you want to build a cleaning station



you should first make some space



Place a couple of Cleaning stations where there is pollution and check the result by clicking on the Pollution button again. You can also see the status of pollution (amongst others) by clicking on the symbols layer button at the right.

Task 5 – Now it is time to help the farmers. Farmers are not very keen on polluted water, but that is out of the way by your previous actions. What else do they need to grow their crops?

To find that out, play with the layer buttons on the right. You should have noticed some issues in the South-western quadrant of the playing field. Fix these problems.

4 Concluding remarks

The Splash! game is just an example how a gaming tool can help building awareness of common problems and how multiple stakeholders interact. Even considered the fact that a tool like this can never be an exact representation of reality, even a simplified representation can be successful to let people understand how certain processes work.