Teacher Academy Project
TEACHING SUSTAINABILITY

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RELEVANT DELIVERABLE:
***D2.4 TAP-TS Project LTP Using Serious Games for Teaching Sustainability*.**
ASSOCIATED TASK: *T 2.10*

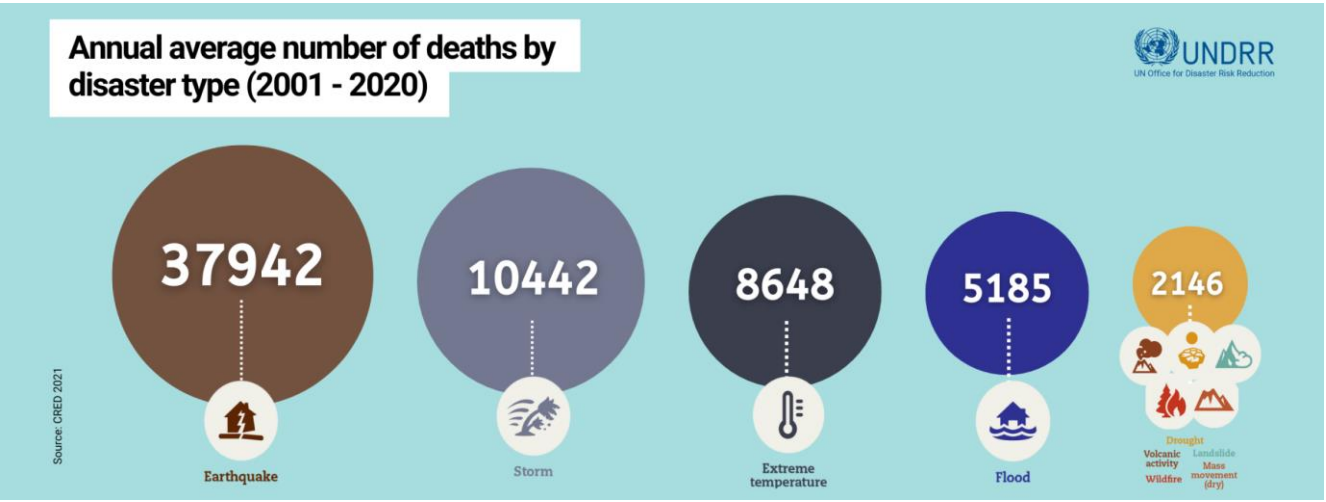
UNDRR *STOP DISASTERS!*
Simulation Game Support Materials
[DRAFT v1]

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Context

The United Nations Office for Disaster Risk Reduction (UNDRR) has the mission of providing leadership and support to governments and organisations around the world who work in disaster risk reduction, with the goal of creating a world where natural disasters do not threaten the well-being of people or the future of the planet.



As part of their outreach, they have worked with game developer *PlayerThree* to create the **Stop Disasters!** game, which helps players learn how to prepare for various natural disasters.



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This document focuses on the Flood scenario, which takes place in a fictitious small village of a few hundred people in Eastern/Central Europe. The village is built on a large river which will flood after 25 minutes (in the Easy scenario), or when manually triggered by the player. The difficulty of the scenario affects how much money the player is given, how long they have until the disaster, and how many people live in the village and require shelter. The recommended starting difficulty is Easy.



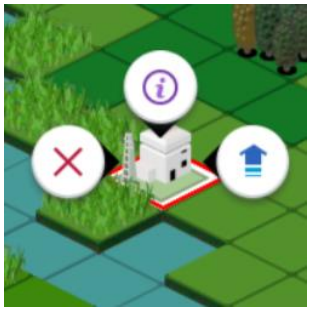
The game uses a **Risk system** to determine which parts of the map are in greatest danger, generally low-lying areas near the river. Buildings in these high-risk areas should be protected or replaced by buildings in lower-risk areas, and new construction should focus on low-risk areas. As the game explains, this is often not the case in reality due to economic and social factors.

On unbuilt tiles such as Grass, Mud, Farmland & Trees, the player is given up to four options. Going clockwise from the left, these are:



- Construct a flood defence.
- Get information about the tile.
- Construct a building.
- Repeat – this button appears after the player constructs a defence or building and will construct another on this tile.

On building tiles the player has different options:



- Demolish the building – this is not allowed on Power Stations, Wells, Pylons, or the Community Centre. All other buildings can be removed.
- Get information about the building.

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- Upgrade the building.

Using the time and money available, the player will prepare the town for the upcoming flood. After the flood occurs, there is a short report on how the player performed, noting the amount of damage and the numbers of wounded and killed. Players will have to repeat the scenario a few times before succeeding.

In the game, the player has much more control over the village than would be experienced in real life. For example; there is no planning permission before constructing new builds, and no community consultations before demolishing existing structures. It is also important to note that the game prices are not reflective of the real-world cost of these constructions and upgrades. This is not brought up to undermine the simulation, but teachers should be aware of these limitations when using the game as a learning aid, and ensure the ‘gamification’ does not trivialise real-world disasters.

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Non-constructable buildings

Building	Description	Upgrades
Community Centre	The community centre is a focal point for all activity involving the community. It is also the location for the early warning system and provides shelter for evacuation plans.	Evacuation Signs Local Alarm System Evacuation Training Radio System
Well	The wells in this area are used for the local water supply. If they are not protected during a flood, they may be contaminated by dirty water and create a public health risk.	Water Source Upgrade
Power Station	Generates electricity for the community.	Raised Building Sewer Backflow Waterproof Sealant
Pylon	Carries electricity to nearby buildings	

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Constructable Buildings

Building	Description	Cost	Upgrades
Wood Hut	Small wooden huts provide little protection against floods on their own but are cheap.	150	Raised Building Sewer Backflow Waterproof Sealant
Brick Cottage	Brick cottages provide better protection against floods but it's advisable to build additional defences.	250	Raised Building Sewer Backflow Waterproof Sealant
Brick House	Houses waterproofed brick can provide some protection against floods.	400	Raised Building Sewer Backflow Waterproof Sealant
4 Bedroom Concrete House	Concrete housing provides the sturdiest buildings.	850	Raised Building Sewer Backflow Waterproof Sealant
Hotel	Hotels provide accommodation for a large number of people increasing community wealth.	950	Raised Building Sewer Backflow Waterproof Sealant
Church	Churches are large strong buildings that can provide a safe place for a lot of people in the surrounding area.	1050	Raised Building Sewer Backflow Waterproof Sealant
Commercial Block	Commercial areas must be kept safe as a lot of people depend on their services.	850	Raised Building Sewer Backflow Waterproof Sealant
School	A school provides education and also provide a central meeting point or refuge during a disaster.	1000	2 Week Course Stop Disasters! Building Reinforcement
Hospital	When people are injured during a disaster they will be transported here. Make sure you locate this carefully and safely.	1200	1 Week Course Building Reinforcement

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Flood Defences

Defence	Description	Cost
Stabilized Slope	These manufactured panels are designed to stop landslides during floods.	175
Earth Levee	Earth levees are barriers built between buildings to stop the flow of water.	700
Rock Dyke	A Rock dyke is a strong barrier that directs the flow of the water away from built up areas.	300
1 Meter Wall	Walls can be constructed anywhere around town areas to make a protective barrier. However be aware that big walls will trap water behind them.	300
2 Meter Wall	Walls can be constructed anywhere around town areas to make a protective barrier. However, be aware that big walls will trap water behind them.	500
3 Meter Wall	Walls can be constructed anywhere around town areas to make a protective barrier. However be aware that big walls will trap water behind them.	1000
Drainage Ditch	Drainage ditches act as overfill channels for flood plains providing a place for the water to go. However, they can fill up if they are not maintained and cleaned.	300

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Upgrades

Upgrade	Description	Cost
1 Week Course	If trained well, the staff will be better prepared to protect tourists during disasters.	250
Stop Disasters!	The 'Stop Disasters' educational packs can be handed out to the pupils to increase disaster awareness and encourage safe practices.	300
2 Week Course	Disaster awareness courses run over a 2-week period by an expert on disaster reduction. Pupils that attend will have a better chance of survival during emergencies.	550
Building Reinforcement	Reinforce the structure of the building to make it more resistant to possible damage in the event of disaster.	450
Evacuation Signs	Signs can save lives when people are rushing to evacuate a location.	300
Evacuation Training	Organise drills and simulation exercises	300
Local Alarm System	Local alarms with sirens or loudspeakers can be the most basic and quickest way to alert people in time to take evasive action.	150
Radio System	Telecommunications solution for issuing warning messages	500
Raised Building	Raising the building 1-3m from the ground hugely increases its integrity during tsunami, allied with good foundations, the building will allow much of the waves power to pass below the building resulting in less damaging flooding.	200
Sewer Backflow	During some hurricanes the flooding can cause sewage to backup into the house causing damage that is difficult to repair and creates health hazards, the sewer backflow valve prevents this.	150
Waterproof Sealant	The waterproofing of buildings is a great way to secure a building from water leaking in and causing water damage to the interior.	250
Water Source Upgrade	Covering the well securely will reduce the possibility of the water source being contaminated.	150

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Key Facts

1. Natural wetlands, flood plains and forests provide excellent natural protection as they can absorb a quantity of flood water. Maintaining open flood plains and wetlands is a major contribution to flood prevention as they help to spread or reduce the destructive force of floodwaters and can minimise flood impacts.
   ➔ *Relocate people and property from floodplains, where possible*
2. Buildings need to be situated and built considering the landscape and river or flooding characteristics. Those located further from dangerous water conditions and on higher ground stand a better chance of survival during floods. Economic factors however can drive people to place buildings too close to water hazards. You can use the risk map to identify areas most prone to flooding and danger
   ➔ *Unlocked by constructing buildings.*
3. Dams and reservoirs, dikes and levees, retaining ponds, flood channels and flood walls may help to reduce flooding in particular conditions. However, they also are costly and can be disruptive to the natural environment. If they are built correctly they can limit the damaging forces of floodwaters.
   ➔ *Build an earth levee.*
4. Evacuation plans are crucial to saving lives. They can be as simple as knowing the quickest way to evacuate, going to higher ground, or as elaborate as community exercise drills organised by local leaders or government officials. As you have installed an early warning system, an evacuation now will be possible once an early warning and official instructions are given.
   ➔ *Upgrade the community centre with some form of early warning system*
5. Protecting wells and other local sources of drinking water from contamination is important as floods often carry toxic materials, raw sewage, animal waste, oil and chemicals. This activity will avoid additional disaster when floods occur.
   ➔ *Cover all wells.*
6. Where flooding is common, when possible build in a way and with materials that can avoid or withstand the damaging forces of floodwaters.
   ➔ *Unlocked by constructing buildings.*
7. If possible, avoid building on flood plains, or other areas prone to flooding. A risk map can show which areas are most exposed to different types of disasters. If a community makes its own risk map the people can learn more about the safer places to live or build.
   ➔ *Activate the Show Risk map mode.*

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8. Locate peoples' homes, schools and important public buildings above likely flood levels. This is an effective way to increase people's safety and protect buildings from serious damage. By exploring the options available for upgrading buildings, you will understand how simple measures taken in advance can offer important protection.
   ➔ *Upgrade a building.*
9. Once an evacuation is announced, people will go to community shelters. Evacuation plans should include special arrangements for elderly, young and disabled people and ensure adequate food, water, sanitation and lodging facilities. Schools, a stadium or other public buildings in safe locations should be planned and supplied as possible emergency shelters.
   ➔ *Planning and education are reasonably cheap and represent good value*
10. Schools and hospitals can become excellent meeting and shelter places in addition to providing important education and medical help. As everyone in the community will know how to go to these buildings quickly, they should always be constructed in safe areas and be protected as much as possible.
   ➔ *Build a hospital.*
11. Floods can trigger other disasters such as mudslides, collapsed bridges, or create conditions of inaccessible and therefore uncontrollable fires. Protecting critical infrastructures from these possible secondary risks is vital.
   ➔ *Build flood defences and use trees to anchor slopes.*
12. People need to know about local natural hazards so they can recognise early signs of their approach, and then flee to safety. Listening to local and regional weather information and having a good knowledge of what to do when flood alerts or warnings are issued can save lives.
   ➔ *Build a Radio System in the Community Centre*
13. Basements and underground buildings are especially prone to flooding. Important or expensive appliances, heating and electrical systems, should be located above likely flood levels.
   ➔ *Construct a Raised Building upgrade.*
14. Flooding can cause sewage to enter houses through drain pipes creating additional health hazards. Installing sewer backflow valves can help to minimise this risk.
   ➔ *Build a Sewer backflow upgrade on a house.*
15. Development on a flood plain is risky and must be carefully planned. Any efforts to redirect rivers or to canalise water flows often creates additional flood risks. It is best to leave flood plains as unbuilt areas, such as for recreational use, nature reserves, for agricultural land or pastures.
   ➔ *Clear floodplains, if you can*

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Game maps





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The materials in this Handbook are drawn in the main from the UNDRSS website [https://unric.org/en/stop-disasters/] and/ or support materials and resources provided free to use by various parties in relation to the UNRDSS ***STOP DISASTERS!*** game. The Handbook is intended solely for the use in relation to TAP-TS activities and courses and should not be copied or distributed further without the permission of the TAP-TS Project. All copyright of content and images used is acknowledged & respected; fair Educational Usage applies.

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