1. What happened?

(Y4 Ahrtalbahn, 2022)

Intro to Ahrweiler

Ahrweiler is, together with Bad Neuenahr, the capital of the Ahrweiler district. The city has a population of 20,000 people or 10,000 houses. The majority of the settlement in Ahrweiler lies along the river, with wine fields located in the hillsides.

What happened?

The map to the left shows the official flood lines marked in white hatching, and the actual area of the flood marked in transparent white. The photos to the right shows drone photos of the area around the river after the flood. As you can see the area is covered with debris and clay, but most of the trees, and almost all the houses are still standing.

The flood

(Edmund Ahrtalbahn, 2021)

The flood

Even though Ahrweiler was heavily affected by the flood, the damages were not as substantial as in other parts of the region. The river did flood most of the city as seen in the pictures, but apart from mobile homes, most of the buildings did not get taken away by the water.

The photos to the left is taken inside the old city walls. The photo to the right shows a building that is not within the official flood lines. But as shown in the photo, it was still very much flooded.

The bridges

The area had 5 bridges over the river. The bridges showed to be a problem during the flood, because they clogged up with debris, and exaggerated the damages to the surrounding area. All the bridges except for one were completely destroyed and unusable after the flood, as seen in the pictures.

Historical maps - river

(Ortsmitte, 2021) (Ortsmitte, 2021)

Historical maps

I have looked at historical maps to see how the river used to look like before, and the placement of the buildings compared to the river. If we look at the map from 1820 to the left, you can see that the river used to look a lot different from today.

You can see the blue river in the map inside the yellow circles, and that it used to be divided into multiple small rivers in certain places. In the map from 1870 to the right, the river looks more like it does today.

2. What is happening?

(Y4 Ahrtalbahn, 2022)

(Y4 Ahrtalbahn, 2022)

Infrastructure

(Deutsche Bahn, 2022) (Edmund, 2022)

Temporary bridges

(Edmund, 2022) (Dalla Lombardia, 2022)

High priority:

- The old town hall
- Ahrweiler the station
- Ahrweiler elementary school
- The old city wall
- Ahrweiler outdoor pool
- Cemetery with chapel
- Ahrweiler church
- Shops
- Bike lanes
- Bike parking
- Parking spaces
- Street lighting

Priorities

Question: How do you intend to rebuild?

It's not about rebuilding. Because it is neither possible nor sensible to rebuild the destroyed structures 1:1 as they were before the flood.

Question: That means the city will get a completely new face?

Yes.

One of the biggest challenges is to integrate future ideas for a modern and sustainable urban development - and still retain the usual charm and vitality.

Question: What role does flood protection play?

A crucial one! We must plan and build all buildings and bridges in such a way that similar events can no longer cause such damage.

(Interbezirksverbande.de, 2022)

Priorities

The city has made a list over which parts are most urgent in the reconstruction. The list can be seen on the left. These include the old city wall and the bike lanes, among other things. In a news pamphlet made by the city, the director of reconstruction and development was interviewed about the future of Ahrweiler Bad Neuenahr. He said in the interview that the focus was not in rebuilding 1:1, but to integrate future ideas and focus on flood protection. The interview can be read to the right.

Flood protection

Someone has started making flood protection banks out of willow by Kloster Calvarienberg as seen in the pictures. These are going to root and turn into a forest in the future. It is unclear whether this is an official measure, or someone trying to help.

3. How should we go forward?

My design approach:

Minimizing the flood before it hits the city of 28.200 people, through water retention areas

Potential water retention areas

(Edmund, 2021)

The flood

I have focused on one potential water retention area in Ahrweiler, but for this to work it has to be implemented on multiple areas along the river. I have mapped out some of the potential areas in yellow here on the map, and the one I'm going to be talking about is the one to the right in the orange square.

It might seem like a water retention area isn't enough to stop a flood from happening, but considering that Ahrweiler was not actually hit as hard by the flood as other areas, smaller measures should be enough to make a difference. The water retention areas would have to be combined with giving the river more room in general, not building in the hazard zone, and constructing bridges that does not obstruct the river.

The water retention area

(Google Maps, 2021)

The water retention area

To explore the water retention area I have made a 3d model of the area. You can see the area that I have worked on inside the orange square.

In these diagrams you can see the area at different water levels. From high water levels on the upper left, to low water levels at the bottom left.

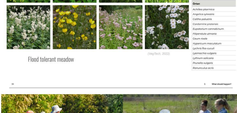
I made an illustration to show how this might be perceived in reality. This is how the area looked before the flood.

And this is how it is going to look at a medium water level. I have given the river room to expand when needed, without the river drying out during dry seasons. For reference you can see the river in the back by the row of trees.

Vegetation

To avoid the vegetation from doing more damage than good, I have focused on using vegetation that is shown to be resilient to flooding, like the salix family. The trees would be planted to mimic a natural wet woodland, with trees in clumps to support each other. It is of great importance to choose trees that can withstand water, to not produce more debris in the water, and thereby block the flow of water.

The trees would also provide important shadows in the summer months, and be a habitat for birds and other species. Providing shadow is potentially going to be even more important in the coming years with rising temperatures due to climate change.



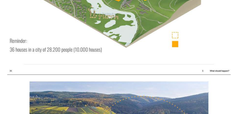
Flood tolerant meadow

(Stadtbaum, 2021) (Stadtbaum, 2021)

Meadow

Trees can be an important tool in water management. Roots take up water and help create conditions in the soil that promote infiltration. Roots can also be a tool for minimizing erosion.

The ground is covered in a flood tolerant meadow with species that can live in both dry and wet conditions, and create both visual and ecological qualities. The meadow would act as a habitat for insects in an area that is increasingly covered in monocrops of grasslands.

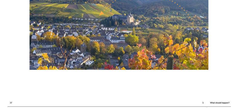


Recreation and nature

(Stadtbaum, 2021) (Pfitzig, 2021)

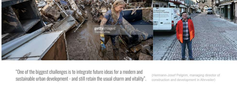
Recreation

In addition to minimizing a potential flood, the water retention areas can be a potential area for recreation. The area is left in a relatively wild state, without human elements that would cause problems during a flood. Recreation has been taken into account when shaping the terrain to be accessible for humans during low and medium water levels.



Reminder:
36 houses in a city of 28.200 people (10.000 houses)

(Stadtbaum, 2021)



Moving the houses

In order to make the best possible water retention area I suggest moving 36 houses. I know this might not be very popular, but I would like to emphasize that we could potentially save a city with ten thousand houses by doing this. It would be possible to keep the houses but that would make the area less efficient, and those houses would be the first to flood.

This illustration shows how the city is going to look after moving the houses. This picture shows how it looked before the flood.

And this illustration shows how it could look in the future, if we focus on integrating the housing with exciting houses. The style of the houses would be adjusted to exciting housing.

"One of the biggest challenges is to integrate future ideas for a modern and sustainable urban development - and still retain the usual charm and vitality".

(Interbezirksverbande.de, 2022)

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