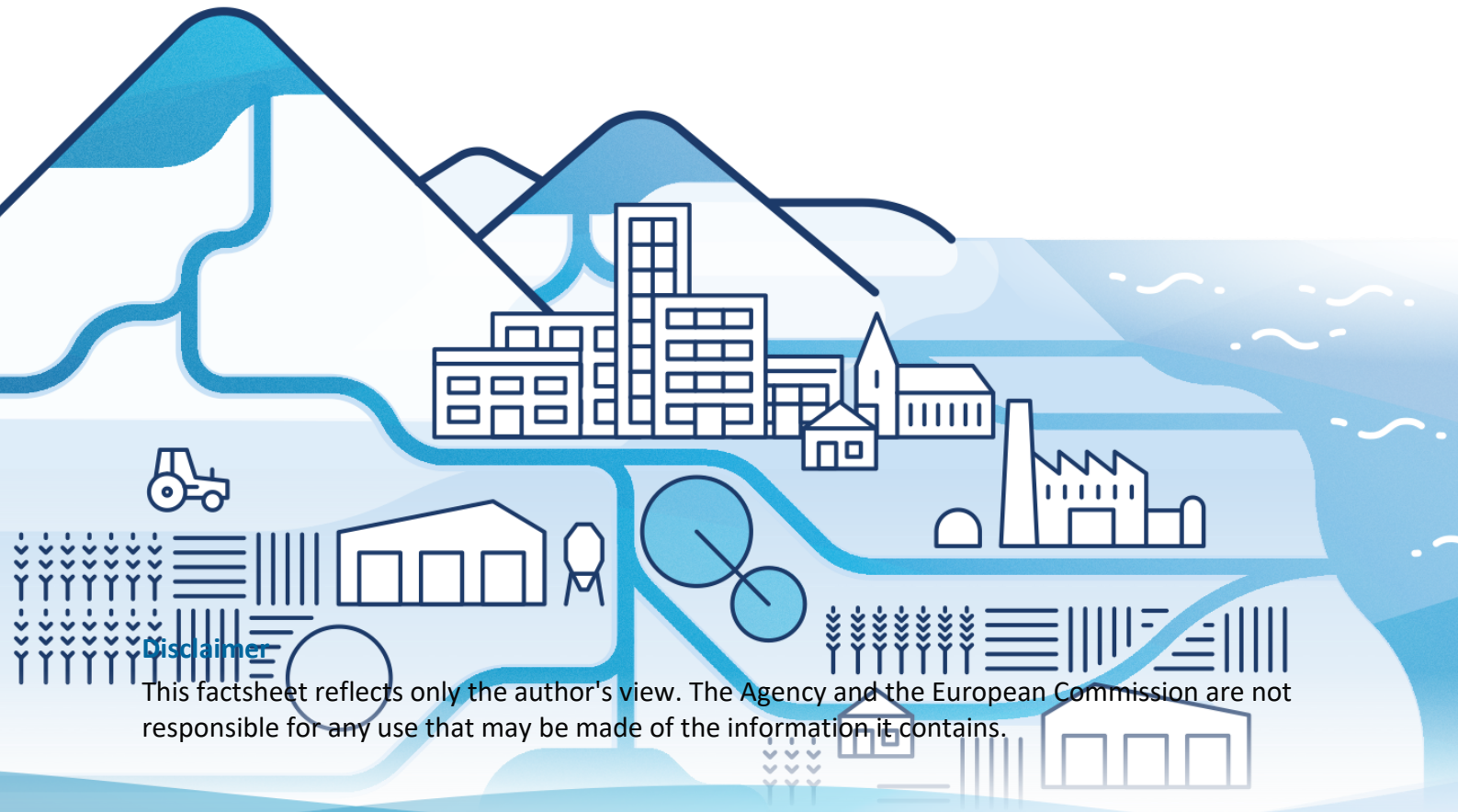


Factsheet – Automatic floodgates

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Automatic floodgates



Unique selling points:

- ✓ Automatization of the data acquisition related to ditches flow as well as the surface water and groundwater levels.
- ✓ Avoiding land flooding through rainwater harvesting (1%).

Description of the technology

Automatic floodgates are drainage ditches with IoT (Internet of Things) technology. Ditches collect and drainage rainwater to storage systems and IoT allows to automatically acquire a high number of data related to rainwater harvesting per surface and year; the flow of the ditches and the water level of the natural systems where the water drained by the ditches is stored; water evaporation; water consumption, etc.

A large number of ditches in several parts of the world prevent farmland from being overflowed during spring and summer rains. The automatization of the measurements of the ditches flow, and groundwater and surface water levels contribute to the optimal function of these ditches and the water balance in the area.

The drained water by the ditches can feed storage systems (such as **natural ponds and artificial surface dams**), can be directly infiltrated to the aquifers or can be also treated and used for several applications.

In the NextGen project, ditches, land areas and storage systems have IoT technology installed measuring flow, groundwater and surface water levels 4 times a day. Water from the ditches feed the **natural ponds and artificial surface dams** where water is temporally stored. The capacity of the system is around 8500 m³/ha/year of water stored and 7500 m³/ha/year of water recovered.

The simplified diagram of the process is schematized in Figure 1.

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Flow scheme of the technology



Figure 1. Scheme of the automatic floodgates system used in the NextGen project.

Pictures of the technology



Figure 2. Images of the sensors for measuring surface levels and water flow for control of the automatic floodgates used in NextGen project. Left: One of the data collection boxes for receiving and sending the data to the Steven connect data platform, Middle: Calibration of a sensor in place, Right: a flow rate measuring control board with two sensors, one before the board and one after. From those data, the flow rate can be predicted.

Synergetic effects and motivation for the implementation of the technology

✓ Data acquisition

The automatic floodgates allow to acquire a high number of data related to rainwater harvesting per surface and year; ditches, the flows and capacities of **natural ponds and artificial surface dams**; water evaporation; water consumption, etc. Therefore, they contribute to generate a wide database with this information highly valuable for the region where they are applied.



✓ **Reduction of the drinking water consumption**

By the proposed scheme, the rainwater recovered in the rainy periods is collected by the ditches, and temporally stored in the **natural ponds and artificial surface dams** for being used in summer period. Thanks to the application of the automatic floodgates the control and automatization of the process is optimized. This contributes to decrease the drinking water consumption from the direct exploitation of the aquifers.

Requirements of the technology and operating conditions

The following table summarize the requirements of the automatic floodgates system to operate in the most appropriated conditions.

Table 1. Required specifications for the automatic floodgates system.

Parameter	Units	Min	Max	Reference
Water volume	m ³	0	100,000	Testbed Storsudret at Gotland
Turbidity	NTU	0	10	Testbed Storsudret at Gotland

Key performance indicators

Table 2. KPIs for the automatic floodgates system.

Parameter	Units	Min	Max	Reference
Percentage of water stored	%	50	200	NextGen, D1.2

Links to related topics and similar reference projects

Automatic floodgates	Reference
NextGen	Case study "Gotland" (NextGen)

Outlook

Case study specific information will be provided, when the results of the other work packages are available:

- Lessons learned from the case study
- Outcome of the assessments
- Legal and regulatory information concerning the whole value chain concerning the technology
- Business opportunities

