



Check dams in Bavaria: Choosing the right building material for the dam location

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In Bavaria the use of check dams in order to consolidate slopes prone to erosion can be dated back to the 19th century. Four different types can be distinguished by their building materials. All of them have their advantages and disadvantages in matters of construction, maintenance and cost. Regarding the surrounding conditions the suitability of each construction type at a certain location can be rated individually. This facilitates choosing the construction type with the best cost-value-ratio. The surrounding conditions not only comprise underground situation, principal process type and structure dimensions, but also accessibility and intended lifespan.

Concrete check dams are either realized with or without steel reinforcement. Non-reinforced construction types are designed as gravity dams according to Swiss guidelines. Reinforced construction types are applied with structures higher than 5 m or when the dam is to be built as an angular retaining wall in order to reduce soil pressure.

Stone check dams are designed as gravity dams with a maximum height of 5 m. Formerly they were built using stones and mortar only. Nowadays they feature an armourstone casing with a concrete backfill. The percentage of concrete in suchlike structures amounts to 20-30 %.

Wooden check dams are designed as crib barriers. They can be built up to a maximum width of 12 to 15 m and up to a maximum height of 5 m. Their advantages are a low soil pressure and the ability to absorb deformations to a certain degree without losing their functionality. Further they can be very cost-efficient to build and maintain if the intended lifespan does not exceed 20 years and wood is available from state forests. Maintenance usually comprises replacing the upper log due to abrasion or replacing the logs framing the spillway section due to rot.

Gabion check dams are designed as gravity dams. Due to their low dead weight they can be very suitable for soft ground. Similar to wooden check dams they are able to absorb deformations to a certain degree. If the intended lifespan does not exceed 50 years, building and maintaining them can be very cost-efficient. Unlike stone and concrete structures, gabion check dams have to be rebuilt thoroughly once damaged.

The most important framework conditions have been summarized and individually rated considering the suitability of each building material for a certain location. The synopsis of the relevant framework conditions at the regarded location identifies which materials are unsuitable for the location and gives a first recommendation on the most suitable and cost-efficient building material. In the second step additional requirements on the planned structure are to be evaluated which cannot be generalized and rated for each building material at all possible locations.