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The use of historical maps for reconstructing landforms before river damming. The case of the Swiss Rhone River

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The Swiss Rhone River was systematically embanked during the period 1864-1893. The Swiss Rhone River valley is a glacial valley filled by glaciolacustrine, fluvioglacial and fluvial sediments. Torrential tributaries contribute to a large extent to the sedimentation in the valley and have built large alluvial fans in the main valley. The period before the river damming corresponds to the Little Ice Age, and it is supposed that the torrential behaviour of the river and its tributaries was very active during that period.

In parallel to a large hydraulic project (Third Rhone River Correction), aiming at enlarging the river for security and environmental reasons, this project aims at reconstructing the palaeogeomorphology of the river floodplain before and also during the 30-year long embankment project developed during the last decades of the 19th century. The objective is to better know the geomorphological behaviour of the river, and also to localize palaolandforms (meanders, braided patterns, sandstone dunes, wetlands, etc.), present in the floodplain in the first part of the 19th century and that have now totally disappeared. The project is carried out in close collaboration with the Cantonal Archives of Valais and with a group of historians working on the relations between the river and the communities. It should contribute to a better knowledge of the Swiss Rhone River history (Reynard et al., 2009). Both published official maps (Dufour maps, Siegfried maps) and unpublished maps and plans are systematically collected, digitized, and organised in a database managed by a Geographical Information System. Other data are collected (place names, geomorphological, hydrological and hydraulic data, information about land-use and vegetation, paintings and photographs, etc.) and localised. A high-resolution digital terrain model and areal photographs are also used and allow us to map palaeolandforms (meanders, filled oxbow lakes, former channels, etc.). In a second step maps of the palaeogeomorphology of the river floodplain are produced and analysed in collaboration with the historian colleagues.

Reference

Reynard E., Evéquoz-Dayen M., Dubuis P. (eds) (2009). Le Rhône : dynamique, histoire et société. Sion, Cahiers de Vallesia 21, 238 p.