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Flood risk reduction by traditional riverine land management in the Sió River basin (NE Iberian Peninsula)

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The analsys of two important flash floods occurred in the Sió River basin in November 2015 and November 2016 respectively has pointed out the unpremeditated effect of traditional riverine land management on flood mitigation.

Indeed, in this area, farmers have traditionally cultivated the flood plains, thus gaining land to the river, eventually constraining the channel to a very narrow section (1.3 m deep and 2 m wide). This narrowing of the channel results in a reduction of the drainage capacity of the channel; therefore, floods flow over the flood plains more easily, thus slowing the flow and storing part of the runoff volume, consequently, laminating the flood downstream. Another factor that contribute to the amazing flood lamination observed in this basin is the high infiltration capacity of the alluvial aquifer during the floods (i.e. sponge effect) , that swallow the most part of the runoff volume. The 2015 peak flow was laminated from 150 m3 s-1 to 45 m3 s-1 in only 30 km of river, and to 8 m3 s-1 in 60 km.

This unplanned lamination limited very much the damages of the 2015 flood in the highly exposed town of Agramunt; nevertheless, these damages were great because, besides many flooded households, four people died.

Due to this ancestral non-intended flood lamination effect, recent urban growth in Agramunt has occupied the flood plain, thus increasing flood exposure. Therefore, this serendipitous land management should be preserved and favored to improve flood risk management (nature-based solutions) in similar areas.