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Flooding risk reduction and human utilisation effects on a coastal plain in the latest 150 years (Southern Italy)

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In the type of region as Calabria (Southern Italy), characterised by mountainous morphology, the areas suitable for agriculture and urban development are represented by narrow river and coastal plains. The human utilisation of these areas is often hard-fought with rivers and flowing waters; floods cause periodically damage to agricultural activities, roads, rural settlements and, sometimes, to people.

In Calabria the Sibari Plain represents the widest lowland of the region. It is located on the Eastern side of the region and bordered from the carbonate group of Pollino Mount (to NW), the Coastal Chain (to W) and the Sila Massif (to S). The plain, which name is inherited from *Sybaris*, the ancient and flourishing colony of *Magna Graecia* founded among 730 and the 720 b.C., was constituted by sedimentation of Crati river and its tributaries.

In this plain, the river network was interested, in different periods, by a series of hydraulics works aiming to cope with both the flood damage and the diffuse water pounding which was the triggering factor of the malarial diffusion. This kind of works has permitted a more profitable exploitation of the area but has strongly influenced the original arrangement of the plain; at same time the realisation of these works, mainly embankments, has often suggested in local people the wrong belief that river floods where defeated.

The management of works was provided from different regional and national Offices and works were carried out in different periods in the latest 150 years. For these reasons no systematic inventory of these works is available. On the other side, the historical series of destructive Crati river floods is undoubtedly the richest that can be

reconstructed by mean of a detailed historical research, being constituted by events as old as 1000 years.

In the present work two historical research have been performed: the first in order to delineate the main (more destructive) river floods occurred on the Sibari Plain and the second aimed to report the remedial works carried out to cope with flood and to allow a better exploitation of the plain.

By considering results of historical analyses, the different segment of the river network on Sibari Plain have been classified, using a GIS approach, on the base of frequency of flood damage events and types of structural works carried out.

The analysis of damaging floods time series allow to evaluate, site to site along the river network, the effectiveness of remedial works and the residual flood prone areas. Results of the analysis can represent a useful tool to correctly drive the future development of the main plain of Calabria region.

At same time, a preliminary evaluation of the effects of human modification of plain utilisation and of hydraulics works realisation in the latest 150 years is realised considering globally the hydrogeological and geomorphological equilibrium of rivers, plain and of coastal areas.