FLOOD HAZARD MAPPING OF DRINI & BUNA RIVER IN ALBANIA

ICHARM,GRIPS, Student Member ○ Eglantina Zaimaj
ICHARM,Regular Member, Shigenobu Tanaka
ICHARM, Regular Member, Takahiro Sayama
ICHARM, Regular Member, Ai Sugiura

1. INTRODUCTIONS

The occurrence of flood event has become common in many parts of the world. Climate change is largely responsible for flooding in many parts of the word. It is the matter of common observation that climate change is responsible for the changing in the river course, which has further impact on river discharge and therefore poses increased risk of flooding (Rutger Dankers,et al,2008). Various hydrologic models have been developed in the past to simulate flood inundation. The study area is located in the North of Albania and comprises the lower reaches of the Drini and Buna River Systems. The Drini and Buna River Systems are subject to an unacceptably hight risk of flooding, and in recent years have suffered major economic, social and environmental losses due to a series of major floods events, most recently in Januray 2010 and again in December 2010, causing major hardship to the local population and estimated economic damage at the value of EUR 18 million from the second event alone. The objective of the study is analysis of inundation area in order to prepare flood hazard maps for the different return periods. Flood mapping is a crucial element of flood risk management, as stated in the Europe Community and Directive 2007/60/EC on the assessment and management of flood risks will require Member States to prepare two types of maps by 2013 (art 6). EU Flood Directive requirements to produce flood hazard include three scenarios, low probability, medium probability (less than 100years return period) and high probability.

Figure 1. Location map of target area

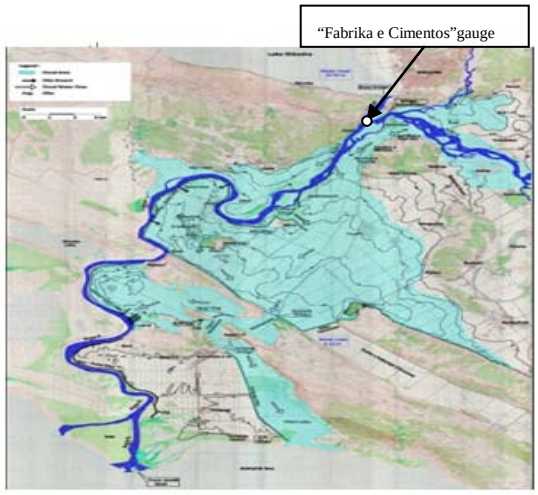

Figure 2. Flood Inundation Map in Dec.2010

2. METHODOLOGY

In this study, Rainfall-Runoff-Inundation (RRI) Model and Geographical Information System(GIS) were used for the inundation simulation. Topographic and discharge data were used as input data for RRI Model. The dicharge data were for 42 days from 20th November to 31st December, 2010 (Figure 3).Return period hydrograph were used. The data were obtained from the report "The Flood Risk Management Plan for the Drini &Buna River Basin", July 2012.The Table 1 shows peak discharges corresponding several return periods of the Drini and Buna River .

Keywords:flood inundation,flood modeling,Geographical Information System

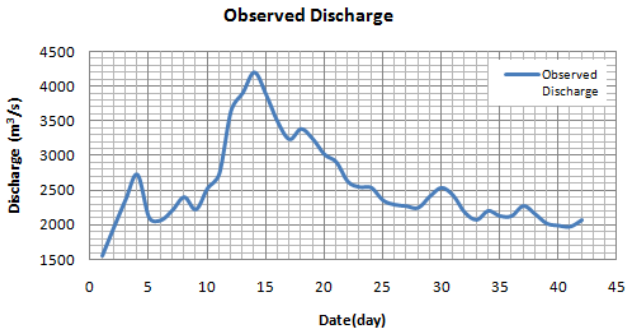

Figure 3. River Discharge Hydrograph from 20th November to 31st December,2010

Table 1. Peak Discharge

Return Period	Buna&Drini river Discharge(m3/s)
2	1888
5	2788
10	3209
20	3599
50	4084
100	4433
1000	5182
Dec-10	4209

3.RESULTS

The inundation map according to the model simulation of 2010 December flood is shown in Figure 4. The peak discharge of the flood 4209 m³/s is close to the 100 year floods so the results are according to the directive 2007/60/EC request. We see that inundation depth is higher in the downstream portion with values close to 4 m. This area is more vulnerable to flooding compared to other area

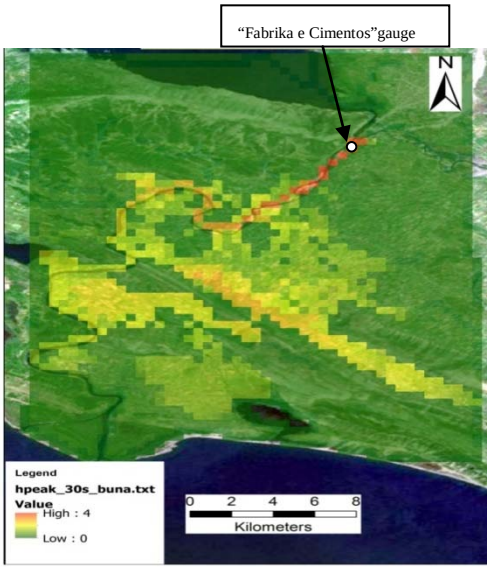

Figure 4. Peak Inundation Depth

4.CONCLUSIONS

In this study, inundation extent with information about inundation depth was predicted and also the inundation areas were visualized based on the upstream river discharge boundary conditions. The performance of existing structural measures (levees) to prevent flooding needs to be checked by using the results in the simulation model. This inundation map can give important information to provincial administration to manage such sort of disaster.

5. REFERENCES

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