Hadâmbu sector of Iași cuesta escarpment – recent mass movement processes and deforestation

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I. INTRODUCTION

The Moldavian Plateau is one of the most representative hilly area and one of the regions most affected by mass movement processes from Romanian. A recent regional historical landslide inventory [1] showed that the general pattern of landslide distribution emphasizes a repetitive model along cuesta scarp slopes. This pattern is related to the lithology and landforms as preconditioning factors. The lithology of the area is dominated by caprocks of limestones, sandstones, and volcanic consolidated tuffs over friable clayey and sandy strata intercalations [1].

The contact between the Central Moldavian Plateau and the Jijia Hills, known as Iași cuesta escarpment exhibit the mentioned landform, lithologic and structural pattern, being one of the areas of the Moldavian Plateau where the landslide density is the highest [1]. At the edge of the Central Moldavian Plateau the Upper Bessarabian limestone and sandstone layers known as Repedea Limestone Formation, overlay the Medium Bessarabian clayey and sandy layers known as Cryptomactra Clays Formation [2, 3].

II. LANDSLIDES FROM HADÂMBU SECTOR

In the Hadâmbu sector of the Iași cuesta escarpment the old landslides were reactivated by recent deforestation and slope cutting for road construction (Figs 1 and 2). This sector illustrates better the effect of land use and anthropic preparatory factors. The landslide reactivations were triggered by heavy rainfalls which overlapped with the snowmelt, and in general happened during March-April interval.

In the last few years, these dense reactivations of old landslides created major dysfunctions for the local communities, despise major investments in road repair.

For the road sector that climb this part of Iași Cuesta (between Hadâmbu village and Hadâmbu Monastery - DC49), in 2009 around 2 million of RON were invested for the rehabilitation of the damages induced by previous

reactivations. Five years later, the reactivation of the old landslide affected again the road after a spring rainy period. The same situation was recorded in March this year a few kilometers to the west in the Voinești sector of Iași cuesta escarpment.

The deforestation along this sector (Figs 3 and 4) happened between 1890 and 1920.

III. CONCLUSIONS

Considering the presented situation we argue that by continuing to invest only in the road infrastructure after landslide induced damages, the history will repeat, especially if future rainy period will emerge. The only chance to provide a long term solution is to study in depth the hydrogeological conditions of the site and to invest in technical drainage infrastructure and reforestation.

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Fig. 1. General view on the deforested slope between Hadâmbu village and Hadâmbu Monastery.

Fig. 2. LiDAR shading image of the slope between Hadâmbu village and Hadâmbu Monastery.

Fig. 3. Aerial image of the slope between Hadâmbu village and Hadâmbu Monastery (1971).

Fig. 4. Forest evolution around Hadâmbu village according to topographic sources (Moldavian Atlas 1:50 000 - 1890, Army Plans 1:20 000 – 1920, Ist and IIInd ed. of 1:25 000 topographic maps – 1960 and 1984, aerial imagery - 2008).