

汶川县映秀镇红椿沟特大泥石流工程防治及初步效果分析

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ENGINEERING MANAGEMENT AND ITS EFFECT OF LARGE DEBRIS FLOW AT HONGCHUN VALLEY IN YINGXIU TOWN, WENCHUAN COUNTY

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摘要 2010年8月14日,汶川县映秀镇强降雨导致红椿沟暴发特大泥石流灾害,冲出固体物质 $80.5 \times 10^4 \text{m}^3$,泥石流堵塞岷江,导致河水改道冲入映秀镇,淤埋了沟口G213国道,毁坏了在建的映汶高速公路引桥路基及桥墩。据调查,在泥石流灾害发生前,沟域内即分布有大量的地震崩滑物源,沟道堵塞极其严重,在持续强降雨下极易发生泥石流。为预防再次暴发泥石流灾害,对红椿沟开展了详细调查,结果显示沟域尚有剩余物源量 $310.14 \times 10^4 \text{m}^3$,其中动储量达 $98.4 \times 10^4 \text{m}^3$,在强降雨条件下再次暴发大规模泥石流灾害可能性较大。本文在对红椿沟“8·14”特大泥石流暴发特征介绍基础上,分析了现状条件下泥石流的活动特征,并预测其发展趋势,最后结合泥石流沟工程治理设计思路及工程布置的作用,提出了全流域综合治理设计理念,即“中、上游稳坡固源拦挡,下游固床+排导”相结合的系统工程治理,通过稳源固坡、分级拦挡、分散淤积、调蓄消能、减势排导等系统的工程措施,达到控制灾害性泥石流发生的目的,确保映秀镇映秀新区、G213国道、映汶高速公路的安全。在工程竣工后的2011年7、8月两次强降雨时,红椿沟未有固体物质出沟进入岷江,治理工程效果得到了初步检验,体现了针对巨型泥石流沟采用全流域综合工程治理设计理念有较好效果。

关键词: 映秀镇 红椿沟 泥石流灾害 治理措施 效果评价

Abstract: A large debris flow disaster was triggered by a heavy rainfall in Hongchun valley, Yingxiu town on August 14, 2010. The debris flow carried out a lot of loose sediments and the total amount is about $80.5 \times 10^4 \text{m}^3$. This debris flow led to serious secondary disasters including Minjiang river was blocked, Yingxiu town was flooded, the 213 highway was interrupted, the roadbed and bridge pier of a ramp bridge was destroyed. According to survey, a large number of loose sediments was distributed in the groove before the disaster., the valley was clogged seriously. So the outbreak of debris flow was inevitable in the condition of strong rainfall. To prevent the occurrence of debris flow again, a detailed investigation was carried out around Hongchun valley. The results showed that there were still many loose sediments of about $310.14 \times 10^4 \text{m}^3$. Among unstable reserves, the loose sediments were about $98.4 \times 10^4 \text{m}^3$. Large-scale debris flow disasters were extremely easy to outbreak in condition of strong rainfall. This paper introduces the debris characteristics, and analyzes its risk and development trend. Furthermore, it formulates the management roadmap of debris flows and puts forward the concept of the whole basin comprehensive treatment. In order to control debris flow disaster happening again, reinforcing management and loose sediment retaining measures are carried out in the middle and upper reaches of the valley. Solid groove bed and platoon guide measures are constructed in the downstream. After the completion of project, during two heavy rainfalls in July and August, 2011, there was not any solid loose sediments into Minjiang river and the treatment project was fine, which can reflect that the whole basin comprehensive treatment design concept has good effect for preventing giant debris flow.

Key words: Yingxiu town Hongchun valley Debris flow disasters Management measures Effect evaluation

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