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# Issuance of the Guide (draft) to Study on Sabo (erosion control) Facility Arrangement as Countermeasure for Sediment Flooding / Inundation using River-bed Variation Calculation

(Research period: FY2016 to FY2017)

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## 1. Purpose of issuance

To prevent disasters caused by sediment movement, it is important to evaluate the effect of control facilities properly and plan countermeasures while forecasting sediment movement phenomena that may occur in the future. However, mountain rivers targeted by sabo projects have complicated characteristics, i.e., a large amount of sediments caused by slope failure, debris flow, etc. are supplied in heavy rain and flow in different sediment dynamics, such as debris flow, bedload transport cluster flow (intermediate flow of debris flow and bed load), bed load, or suspended load. In order to evaluate such sediment dynamics of mountain rivers in heavy rain, it is required to use an analysis method according to the sediment dynamics of mountain rivers in heavy rain and set calculation conditions properly. Accordingly, the Guide (draft) described the method of estimating sediment / flood damage using river-bed variation calculation and the method of evaluating the effect of control facilities for more effective / efficient facility arrangement based on the results of recent research and technological development in the relevant field.

## 2. Main characteristics of the Guide (draft)

Of the target phenomena covered by the Sabo Basic Plan shown in Fig. 1, the Guide (draft) mainly covers "sediment flooding / inundation caused by river bed rise, etc. resulting from runoff sediment from the upstream" ("sediment flooding / inundation")  
Damage patterns of sediment flooding / inundation and scenarios covered by the plan differ according to the locations of targets of maintenance. Accordingly, the Guide (draft) describes the method of setting proper rainfall conditions from a viewpoint of the location of maintenance target with regard to design rainfall as a countermeasure for sediment flooding / inundation. The Guide (draft) also describes the methods of watershed subdivision and water / sediment supply in river-bed variation calculation, method of setting channel shape and river bed conditions, method of verifying calculation results by numerical simulation, and concept of effective facility arrangement planning using river-bed variation calculation.

On the other hand, even when conditions are properly set by numerical simulation and calculation results are fully

verified, phenomena of sediment dynamics are complicated and even a little difference in input conditions may greatly affect analysis results. Further, considering a future scenario of increase in rainfall by climate change, etc., the Guide (draft) expects evaluation of uncertainty to be implemented including examination of multiple scenarios.

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| A.  | Short-term measures for sediment run-off (during a series of rainfall duration)        |
| A-1 | Debris flow / driftwood measures   |
| A-2 | Measures for sediment flooding / inundation (caused by upstream sediment movement)     |
| A-3 | Measures for sediment flooding / inundation caused by driftwood                        |
| B.  | Medium- to long-term measures for sediment run-off (active period of sediment run-off) |
| B-1 | Measures for particularly active sediment run-off                                      |
| B-2 | Measures for continually active sediment run-off                                       |
| C   | Volcanic sediment and erosion control  |
| D   | Measures for abnormal sediment-related disasters                                       |
| D-1 | Measures for debris flow caused by deep-seated landslide                               |
| D-2 | Measures for sediment flooding / inundation caused by landslide dam                    |

Fig. 1 Classification of phenomena to be covered by Sabo Basic Plan

## 3. Conclusion

Many events of sediment flooding / inundation occurred in the Northern Kyushu Heavy Rain in July 2017 and the Western Japan Heavy Rain in July 2018.

Countermeasures for sediment flooding / inundation are urgently required in order to address the localization and frequent occurrence of heavy rain. We hope that the Guide (draft) will be utilized in considering sabo (erosion control) facility arrangement planning as a countermeasure for sediment flooding / inundation and contribute to damage prevention / mitigation.

☞ See the following for details.

1) Technical Note of NILIM, No. 1048, Nov. 2018