

## 2018 implementation plan for expansion of erosion control works focusing on living spheres in Korea

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### 1. Introduction

The mountainous regions of Korea have characteristics of steep slopes and low soil cohesion since most of the soil consists of clay sand made by weathering of granites and gneisses. Moreover, rainfall, which can have a direct impact on landslides, has an annual average of 1,300 to 1,500mm, with much of rainfall being concentrated in summer. Because of these characteristics, those regions are extremely vulnerable to landslides. In particular, with frequent episodes of earthquakes around Gyeongju and Pohang area, there are concerns over landslide disasters caused by not only torrential rain, but by earthquakes as well. Therefore, the Korea Forest Service (KFS) plans to establish and implement the following basic policies for the works to be implemented in 2018: 1) establishment of landslide prevention infrastructure; 2) strengthen landslide prevention and response system; 3) enhancement of landslide prediction capability; 4) expansion of environmentally-friendly erosion control works and strengthen maintenance and management; 5) timely and accurate survey of landslide area and long-term recovery; and 6) establishment of a disaster response system against earthquakes and land creeping (KFS, 2018).

### 2. Scale and cost of erosion control works

The goal of 2018 erosion control works will be to contribute to disaster prevention and land conservation through efficient implementation of works. The expected total budget for the works will be 236,880 million KRW (179,547 million KRW from national funding and 57,333 million KRW from local funding) (Table 1).

Table 1. Detailed summary of erosion control works

Name of work	Scale	Name of work	Scale	Name of work	Scale
Hillside erosion control	167 ha	Stream conservation work	335 km	Erosion control dams	504 sites
Forest watershed management	17 sites	Inspection of erosion control sites	3,014 ha	Inspection of erosion control dams	4,383 sites
Safety measures for erosion control facilities and dams	54 sites				
Total budget: 236,880 million KRW (179,547 million KRW from national funding and 57,333 million KRW from local funding)					

### 3. Detailed implementation plan

#### 3.1. Establishment of the basis for implementation of landslide prevention

We plan to establish the basis for a comprehensive national disaster management system for landslides by seeking to strengthen the response capacity and overhaul the prevention policies for landslides by reviewing the enactment of the Small-scale Landslide Disaster Impact Assessment System and amending the Forest Protection Act and Erosion Control Work Act. In addition, we also plan to maximize the impact of prevention education by segmenting differentiated educational plans and strengthen nationwide promotional efforts to expand the culture of safety for landslides. Furthermore, international exchange and cooperation for prevention of landslides will be strengthened through the pursuit of policy training for acquiring advanced technologies.

#### 3.2. Strengthening disaster management system including landslide prevention and response

We plan to establish a preemptive step-by-step prevention and rapid-response system for landslide crisis response through the establishment and operation of a landslide prevention support center and conducting inspections on safety during thawing season and safety blind spots. Moreover, we will also strengthen the designation and management of vulnerable areas by conducting systematic surveys on the risks of potential landslide outbreaks, while also establishing

on-site landslide prevention and response system and strengthening implementation capacity to culture on-site applicability of landslide standards, implementation, and action manuals. We will also establish and implement measures for different sectors in efforts to minimize forest damage due to heavy snow and strong winds during winter.

### **3.3. Improvement in the ability to predict landslides**

We plan to improve the response capabilities against forest disaster during torrential rain by strengthening the non-structural measures such as warning and evacuation system through the expansion of mountain meteorological observation network. We aim to secure safety and on-site utilization by maintaining, managing, and upgrading the functions of landslide information system. We will change the nationwide landslide-related information delivery system from a closed system to an open system, while also pursuing improvement in forecast/warning models using rainfall information. We will utilize an open API to provide relevant agencies (Ministry of the Interior and Safety, broadcast stations, etc.) with landslide prediction and forecast information, while also establishing and maintaining a cooperative system with emergency rescue agencies (fire stations, policy stations, regional response centers, etc.).

### **3.4. Expansion of environmentally-friendly erosion control works and strengthening maintenance**

Erosion control works will be performed with priority given to areas near living spheres that are vulnerable to landslides, which will be scheduled for completion before rainy season (end of June), while erosion control works for high-risk disaster areas near major roads and DMZ military facilities will continuously implemented. The implementation plan for forest watershed management works will include disaster prevention, together with consideration for environmental factors such as preservation of biodiversity and water yield, to ensure that the outcomes produced from the works will impact the entire forest watershed area. By opening the erosion control facility inspection work, maintenance and management will be strengthened by differentiating between visual and precision inspection, supplementing and updating inspection-related regulations, and implementing measures for structural modification on out-of-date erosion control dams. To improve the quality of erosion control works, we will also enhance the on-site work capacity and strengthen the professionalism related to safety inspection and feasibility assessment by the Korean Association of Soil and Water Conservation. By encouraging environmentally-friendly erosion control works and establishing a system for forest watershed management works, we will create the basis for a transition in the paradigm of erosion control works.

### **3.5. Timely and accurate investigation of damages in landslide-affected area and long-term recovery**

Recovery efforts in the areas affected by landslides in 2017 (Chungcheong and Gangwon area) will be completed before the rainy season. Timely and accurate on-site damage investigation system will be established through the operation of a landslide-cause investigation team comprised of experts, provide helicopter support for precise survey of large-scale damage areas, and operations of drones. Recovery-related administrative procedures will be actively reviewed before hand to ensure timely and reliable long-term recovery efforts are implemented in the landslide-affected areas. Moreover, post-event management and response status assessment will be strengthened by effect analyses, including safety inspection on the landslide recovery areas.

### **3.6. Establishment of a disaster response system for earthquakes and land creeping**

For the nationwide survey of land creeping areas, spatial information will be used to designate the areas of concern, followed by on-site surveys based on the assigned priority. Instruments for monitoring the behaviour of land creeping (underground water level gauge, rain gauge, extensometer, soil moisture sensor, earthquake accelerometer, etc.) will be installed and operated to establish a warning and evacuation system. Recovery efforts for areas vulnerable to land creeping will be implemented by applying civil engineering methods based on status survey and precision ground survey.

## **Reference**

Korea Forest Service. 2018. Detailed implementation plans for major works for 2018. pp. 467.

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