

## Japan's Cave Development and Management

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### I. Japan's natural cave development status quo

#### 1. Environment Preservation

- The double-door entrance is installed to control air inflow and to prevent air pollution.

- The lighting system is based on mercury and is installed in limited areas. The lightings are directed to special cave features and installed from faraway distance.

- There are numerous resting areas.

- Passageways are opened on cycles or on seasons.

- Strict maintenances on cave temperature and humidity are executed to protect cave

environment. There are artificial ground-water importing facilities or artificial water transmission installments that are furnished in the upper level of caves.

- The lighting angles are constantly changed upon seasons or upon regular shifting bases.

- There are lockers to keep personal belongings of tourists. Visitors are not allowed to carry foreign materials except a camera.

- In Akiyosidai cave, there is regular cave cleansings to prevent green pollution. However, we can spot ferns or moss growing inside the cave in other areas.

- Annual safety inspection is performed

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that are focused to fall-prevention facilities. Any modifications on facilities or cave installments require governmental permission. The cave facilities undergo constant improvement and refurbishments.

- The interior of caves are mostly dark, and the lighting systems are centered to passageways and special cave features.

- Recording systems that explain cave zones are well furnished, so the recorded voice messages replace tour guides, except emergent situation.

- Environment preservation methodologies and relevant facilities and installments are well furnished to prevent pollution or deterioration.

## 2. Supplementary facilities and maintenance features

- Supplementary features are centered to field education programs in regard to earth science or other combined education system that provide field education to general academic field.

- There were scheduled guiding programs to prevent cramming of visitors or sudden crowd inflow. This enables cave tour and natural science learning.

- Cave vicinity supplementary facilities are well furnished to enhance conveniences of visitors.

- There are various safety measure facilities with well trained safety guard staffs who provide safety education and guidance.

- Supplementary facilities are built and programmed to generate well-mannered tourism and to enhance academic learning.

- The cave guides include education features and self-experiment materials so the students or visitors can acquire better understanding toward cave and learn from the cave tour.

- The supplementary facilities include local area information center, stone museum, botanic garden, animal zoo, insect zone, under ground resource museum and reading areas. Recreational facility and entertainment facility are also installed.

- Relevant facilities provide local area education and profound information on touring areas not only to young students but also to general public. They receive relevant education and can participate to educational programs.

- Facilities are safe and convenient that considered visitors' perspective. This in-turn generated increase of tour population expanding the target to young students and general public.

- The cave itself and the vicinity areas can be utilized as natural science education center where students and general public can use. Relevant programs or projects are still widely studied and developed.

- All supplementary facilities reflect specific features of individual cave.

## II. The imminent problems in Korea's cave management policy

- More fundamental and thorough inspection and supervision are required since Korea's cave management system still lacks safety measurement and environment preservation features.

- The number of visitors should be constantly recorded, monitored and controlled while not affecting the tour.

- Suggestions or comments for safety measures should not be neglected and collected in aftermath of tours.

- There should be uniformed and concord standard in inspecting and evaluating caves, especially when they are designated as natural treasures. The natural treasure and local treasure should be distinguished with different set of standards and grades.

- There should install brief explanations and name tags for cave materials, so caves can be utilized as educational tools for earth sciences.

- Environmental Impact Assessment should be enacted and executed that evaluates and measures caves' inner lighting system (intensity limit) and tour population control. There should be strict regulations on lighting and visitor control system to preserve the cave environment.