

The Environmentally-Friendly Improvement Project of Dam Area

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Abstract

In Korea, the requirement of water resources has increasing rapidly due to population growth, urbanization and increase of the living standard caused by the rapid economic growth during past 40 years. To cope with rapidly increasing demand, Korea had constructed the large multi-purpose dams, such as Soyanggang dam, Chungju dam and etc. Based on the large multi-purpose dam's construction, we could get a lot of benefits such as water supply, electric generation and flood control. In addition, multi-purpose dam gave a generative power to develop Korea economic.

So far, Korean dams are constructed for the purpose of the elementary functions which are mentioned above. Additional functions including regional revitalization by dams are not considered. However, based on rising of people's living standard and changing the important point of view to enjoy leisure time, people thought that dam has addition benefits like reservoir and friendly space to water and nature as well as the facility to protect lives and property from the disasters.

As the change of tendency, it is important to contribute the regional revitalization using the water and nature friendly function from dam and reservoir.

On the other hands, the existing dams which were constructed in former times were aimed at the main function. So they don't have the enough space enjoying the leisure. Continuously, dam has been recognized to dislike facilities by aging as long time goes by. But the dams completed nowadays supply the space to enjoy leisure time by the water culture museum and the open space. They contribute that the dams become the nature friendly rest spaces to customers.

Therefore, Kwater should promote the adjacent area's improvement project. The project includes that the nearby old facilities of dams are improved by now needs based on the reduction of natural damage and the conservation of water quality. Besides, the dam's adjacent areas have to be back to the regional people and nation as the leisure and cultural space by developing the space environmental friendly.

This paper introduces the adjacent area's improvement project for the purpose of regional revitalization and people's living improvement by creating the leisure and cultural space.

Key word : environmental friendly, improvement project, additional function, leisure, regional revitalization

1. Introduction

During the past 40 years, water demand has rapidly increased due to economic growth, rising population, urbanization, and higher living standards. Therefore, the government has constructed multipurpose dams such as Soyanggang Dam and Chungju Dam for water supply, hydro-power and flood control. This has encouraged South Korea's economic growth. Dams' full variety of facility could not be used yet because dam construction had just focused on the problems of water use and flood control, so dams have been regarded as non-friendly facilities

However, based on improved living standards, people's values are shifting from material wealth to spiritual well-being. Therefore, people desire that dam projects secure life and property as well as making a beautiful environment. In addition, people really want to develop dams which can provide practical benefit for the surrounding area. Therefore, it is important to involve local economic factors when we consider a water-friendly environment and the natural environment of dams and reservoirs in dam projects.

So, in case of the existing dams, dam reservoirs containing the water should carry out environmental-friendly upgrades for dam areas focusing on improving old facilities, protecting natural environment, and opening dam facilities for visitors.

This report summarizes the examples of local improvement activities, activating local economies and environmental protection simultaneously based on local people's opinions

2. Dam's Environmental Rehabilitation Project

2.1 Basic direction

Based on the establishment of long-term plans for dam development (2001 ~ 2011) and the amendment of the dam development and support law, the local government and residents could develop without any actual plan for the dam's surrounding areas. It could destroy the ecosystem near the dam reservoir.

This master plan shows the development methods for environmentally-friendly dam construction having sympathy for local neighbors and relevant agencies regarding complex environmental rehabilitation plans including environmental and ecological conservation. In addition, this plan will prevent haphazard construction, remove physical and ecological damage caused by dams, and supply a leisure place for people.

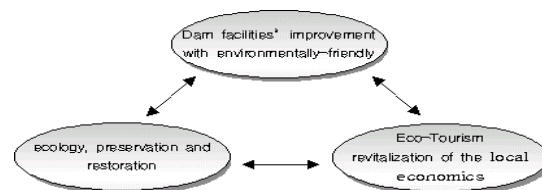


Figure-1. Environmentally-friendly dam management

2.2 Steps for implementation

During the planning, we really endeavor to meet the demands of local society through public hearings with local government, NGO, and local residents. The concept for

environmental rehabilitation was established based on local government ideas as well as localized characteristics. The step of basic plan is as followings:

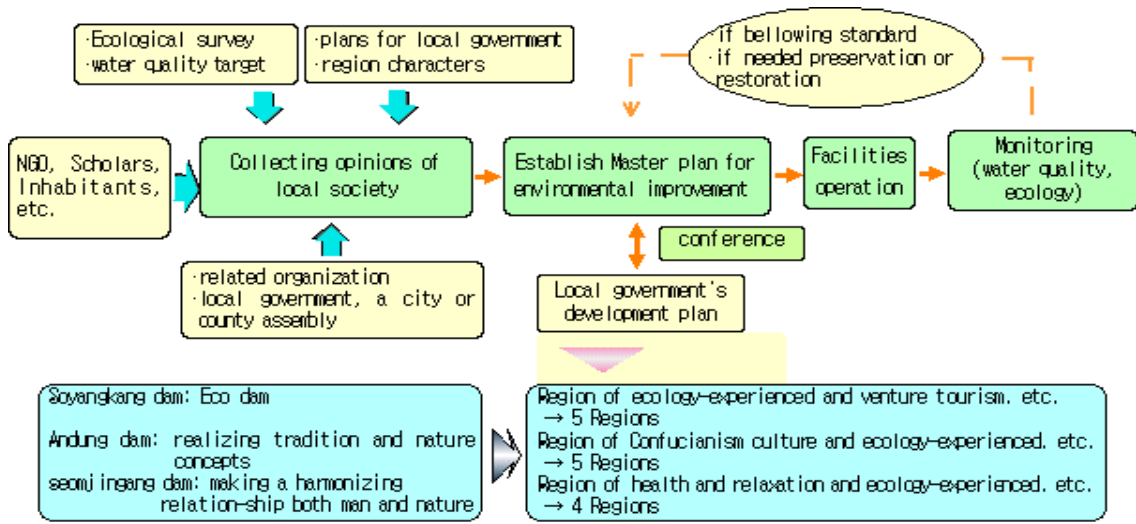


Figure-2. The implementing procedures for environmental dam improvement

Through this step, we realized each dam's character with analysis of society, civilization

economy and culture of the dam area. And then we applied the proper facilities.

Table-1. Main items of dam environmental improvement

| division | | Content |
|------------------|---------------------------------|--|
| Around reservoir | Around dam area | .An observation platform, make the citizens park, improve old facilities |
| | Region of ecology- experienced | .Ecology park, ecology restoration, visitor center |
| | Region of venture tourism | .Making a region of recreation |
| | Region of Confucianism culture | .Confucianism culture experienced place, making a DOSAN memorial region |
| | Region of health and relaxation | .Exercise facilities, multipurpose square |

2.3 The status of implementation

Environmental improvement projects of existing dams such as making eco-experience

place, eco-park, and so on, are under way at 24 facilities (dam 23, estuary dike 1). We have finished 12 facilities so far, and the others are being implemented in order.

Table-2. Each dam project present condition

| Dam name | Status | Major things | Project period |
|-----------------------|--------------------|---|------------------------------|
| Total | 24 | - | - |
| ◦ Estuary dike | completion | Repair the square and around water side, etc. | '04. 1 ~ '05. 2 |
| ◦ Daechung Dam | completion | Repair the square and around water side, scenery lighting, etc. | '04. 3 ~ '06.12 |
| ◦ Hengseong Dam | completion | A forest park and making water friendly space | '05. 3 ~ '06. 6 |
| ◦ Namgang Dam | completion | Washroom, improve the entry road to water-museum | '06. 8 ~ '07.10 |
| ◦ Chungju Dam | completion | First step : square/entry road, observation elevator | '04. 2 ~ '06. 6 |
| | under construction | second step : improve environmental facilities at left side of dam | '07. 4 ~ '08.10 |
| ◦ Soyanggang Dam | under construction | Ecology experience place, wharf improvement | '04. 8 ~ '08.12 |
| ◦ Andong Dam | under construction | River side park | '05.10 ~ '08 .6 |
| ◦ Boryeong Dam | under construction | Improvement of resting place at left side of dam | '07. 9 ~ '08. 9 |
| ◦ Juam(regulation)Dam | under construction | Improvement of resting place at right side of dam and dam downstream park | '07.12 ~ '08.10 |
| ◦ Hamchun | under planning | Waterside resting place, theme ecology park, picnic place | Planning |
| ◦ Imha Dam | under planning | Improvement of resting place at left side of dam, and downstream | Investigating for investment |
| ◦ Buan Dam | under construction | Downstream family park, /entry culture zone | '08. 4 ~ '09.10 |
| ◦ Seomjingang Dam | under planning | Health-Sports park, dam downstream park | '08. 4 ~ '11.12 |
| ◦ Yeongcho Dam | completion | Artificial marsh | '04.12 ~ '06.11 |
| ◦ Gwangdong Dam | completion | Observation platform, dam downstream park, walk road | '04. 4 ~ '05.10 |
| ◦ Dalbong Dam | completion | Upstream environmental park, an observation platform, Ssamji park | '04. 4 ~ '05.10 |
| ◦ Suye Dam | completion | Observation platform, resting place | '07. 3 ~ '08. 2 |
| ◦ Sunam Dam | completion | Water-side walk, downstream resting place | '07. 3 ~ '07.12 |
| ◦ Youngchun Dam | completion | Improve the dam side park facilities | '07. 9 ~ '07.11 |
| ◦ Kuchun Dam | completion | Improve the dam facilities and make downstream eco-park | '07. 9 ~ '07.12 |
| ◦ Deaam Dam | under planning | Improve the dam facilities | TBA |
| ◦ Angye Dam | under planning | Circulation walk road and make eco-park | TBA |
| ◦ Woonmoon Dam | under planning | Making Wharang park, dam slope improvement | TBA |
| ◦ Sayeong Dam | under planning | Improve dam side and resting place | TBA |

2.4 Improvement of existing dam's facilities and lay out of park

The biggest advantage of dams as a tourism resource is beautiful scenery close by the waterside of reservoir and specific dam structure. Therefore, tourism resources of dam and dam's surrounding area could boost local economies and provide people new resting places. This could change negative awareness about dams and promote regional development.

Until now, existing dams have been unpopular because of various regulations, lack of convenience facilities and old facilities



Figure-3. Daechung Dam waterside walk and rest place

In order to change the negative awareness and create new tourism resources, we have to develop dams by reforming dam side facilities such as environmental friendly development and making eco-parks at dam side

The park projects of dams involve improvement of old facilities, development

of wild flower areas, eco-park, walk road and providing convenience and sightseeing to dam visitors. Through these, we want to make dams to a natural education place and leisure activity place

The developing scenery emphasizes a healthy environment and contact with nature. Representative facilities are water side observation deck, eco- marsh, walk road, fountain in reservoir, dam lighting at night time, etc.

Multipurpose event hall and healthy walking places are more examples of facilities. This promotes a good image of a friendly place, through making the multi-capacity park which gives rest, recreation, and a cultural activity, as well as a the attractive lights at night



Figure-4. Andong Dam riverside park

In order to create more uses, a multi-event place with small play areas, outside exhibition places, and health walking places was established. This could give a friendly image of the dam to the residents.



Figure-5. Daechung Dam scenery lighting



Figure-6. Chungju Dam observation elevator



Figure-7. Andong Dam health walk



Figure-8. Daechung Dam ground fountain



Figure-9. Daechung Dam walking deck



Figure-10. Daechung Dam picnic spot

2.5 Environmentally-friendly dam construction

When we constructed a new dam, the damaged area was supplemented as an ecological culture space. It could supply the

tourism benefits of ecology, sightseeing, culture, etc. That makes it possible to succeed and create the regional and traditional culture of the submerged districts for residents and people. Because of this, you can rest and experience regional, traditional culture at the same time.



Figure-11. Jangheung Dam eco-culture park



Figure-12. Jangheung Dam eco-lake



Figure-13. Jangheung Dam traditional culture spot



figure-14. Jangheung Dam wooden fish and stone towers

In addition, artificial structures like dams affect the ecology. Therefore, in order to solve this problem, we have researched and surveyed field nature vegetation and then we restore the dam sliding zone to an

environmentally friendly zone. Finally, the dam has look and pattern similar to the surrounding forest, so that the dam could be harmonious with the forest and the ecological passageway is restored.

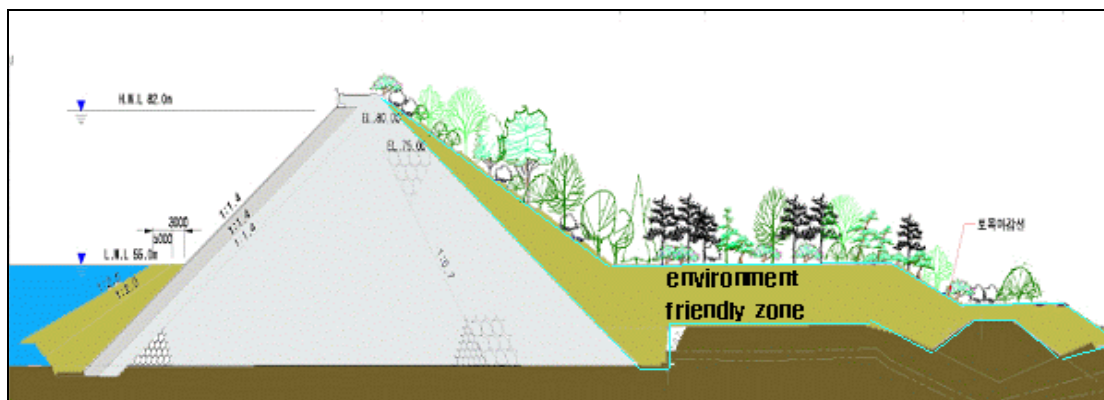
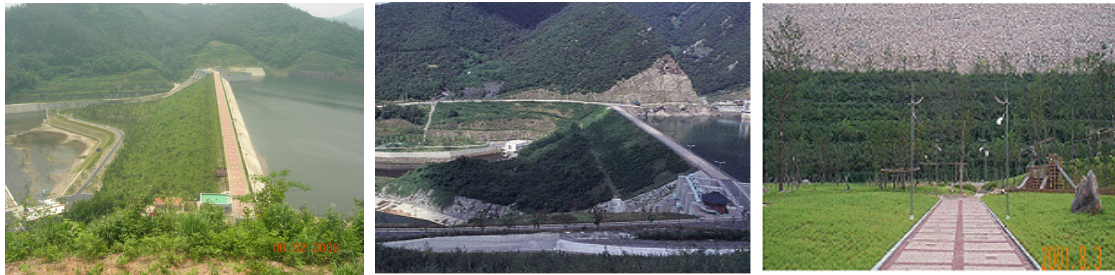


Figure-15. View of dam environmentally friendly surface



Jangheung Dam

Boryung Dam

Milyang Dam

Figure-16. Examples of environment friendly zones

3. Conclusion

The environment could be divided into a habitat for animals and plants, a place for view, and a home for human settlement. Therefore, environmentally-friendly dam management gives an opportunity to experience local culture through seeking the way which minimizes the damage to the habitat, applying and managing the nature-recovering system for the area under the unavoidable situation, and also moving and restoring valuable elements such as cultural assets, keepsakes and scenery.

There are four basic ways for environmentally-friendly management of the dam:

First, establish environmentally-friendly dam management methods for natural sightseeing, ecological protection, and life habitat.

Second, complex developments for water space and stimulation for local economies should be implemented in harmony with local government, residents, and NGOs. In addition, ecological parks should be created to provide recreation space for residents.

Third, at the basic plan stage, amendment for law is needed to induce environmentally-friendly methods. And then at the project stage, we need to set the law to get the public opinion.

Fourth, enough supporting systems for a dam's surrounding area should be made. We need to analyze social and economic impacts of a dam's surrounding area and local government and then basic, element, and long term measures are needed for helping residents and local economies.

As mentioned above, environmentally-friendly dam construction and management could be implemented when both the environmentally-friendly technology and society are in agreement.

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