


Gotjawal Forest

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View of Gotjawal Forest. Forest in such a flat area is very rare in this densely populated South Korea]	
Korean name	
Hangul	곶자왓숲
Hanja	n/a
Revised Romanization	Gotjawal sup
McCune-Reischauer	Kotchawal sup

Gotjawal Forest covers the rocky area of aa lava on Jeju-do Island off South Korea's southwestern coast. Traditionally, Jeju-do's local residents called any forest "Gotjawal" when such a forest was found in rocky areas. Therefore, it is difficult to cultivate crops in the areas, so where could remain undisturbed by people.

Etymology

According to the *Jeju Dialect Dictionary*, "Gotjawal" refers to an unmanned and unapproachable forest mixed with trees and bushes.^[1] However, Song Shi-tae suggested in his Ph.D. dissertation, to give a new meaning to the term "Gotjawal"^[2] because as the Korean term "Gotjawal" shows specifically the feature of "AA Lava. Therefore, using the term "Gotjawal Lava" instead of "AA Lava" can be useful for the land management and groundwater management. In his another study in 2003,^[3] , Song also asserted that protecting the Gotjawal area on Jeju is essential to protecting the island's groundwater, as rain water penetrates directly into the groundwater aquifer in this Gotjawal area through cracks in this region's rocky earth. Nevertheless, some people insist that the meaning of Gotjawal should not be restricted to geological features. They say the ecological, historical, and cultural context should also be considered^[4] . But, it is still not clear how they define the meaning of Gotjawal.

Features of Gotjawal Forest

Three important features of Gotjawal forest are its formation in rocky areas, plants specific to this ecosystem, and rain water penetrating to the groundwater aquifer^[5].

Rocky areas

Gotjawal forest is formed on rocky areas. As it was difficult to develop these areas for agriculture, the forest remained untouched even in the twentieth century. Song (Song, 2000) insisted that Gotjawal's terrain is mainly on AA Lava. Based on his field research, the Distribution Map [6] of Gotjawal Terrain on Jeju-do was drawn. But further research revealed that the terrain is not pure AA Lava but rather a mixture of AA Lava, and Pahoehoe Lava, which Dr. Song also suggested naming *Bille* Lava, following the dialect term of local people^[7].



Typical scene of Gotjawal Forest.

While Gotjawal forest includes Pahoehoe Lava, in some areas, it is true that Gotjawal Forest is overwhelmingly a rocky area which is difficult to cultivate. So the most practical definition of Gotjawal Forest is: "a forest on Jeju-do Island, on land difficult to cultivate because it is a rocky area."

Home to endangered species of plants and animals.

According to Ms. Yim Eun Young's thesis^[8], an area called Dong Baek Dong San (meaning 'Camelia Forest', 590,083 sq. meters) in Gotjawal forest, located at San 12, Seonheul-ri, Jocheon-eup, Jeju City, Jeju Province, is the only known natural habitat of *Mankyua chejuense* <http://www.users.muohio.edu/>, a recently discovered genus. She also found many other species of bryophyte during her investigation. She concluded that the Dong Baek Dong San region in Gotjawal forest is an important area for bryophyte research^[9]. The Korean Ministry of Environment also found a variety of endemic plant species and endangered animal species^[10]. Five unrecorded species of planktons were found during their investigation in 2005 in the Dong Baek Dong San area of Gotjawal forest. According to Yim^[11], other parts of Jeju's Gotjawal forest have not yet been thoroughly investigated.

Rain water penetrating to the groundwater aquifer

The percentage of rainwater permeating into the groundwater is 46% on Jeju-do, the highest in South Korea^[12]. Lava structures such as Lava Tube, Skylight, Clinker, and Cracks contribute to this high rainwater recharge rate^[13]. Such structures are typical in AA Lava^[14]. Therefore, we can say Gotjawal forest contributes to the high groundwater permeation rate of rainwater on Jeju Island. Such a fact can easily be seen from the map. In the northern and southern parts of Jeju Island, there are lots of small rivers flowing from the mountains. But, in the western and eastern parts, there are a few rivers. This is because almost all the rainwater comes down to the groundwater through Gotjawal forest in the eastern and western parts of Jeju, leaving little water to flow through rivers.

Distribution of Gotjawal Forest

According to Song ^[15], there are four main Gotjawal terrains on Jeju-do Island. They cover 224 square kilometers^[16], comprising about 12% of the whole of Jeju-do island (1,848 square kilometers). The Gotjawal terrain is located in the western and eastern parts. Perhaps this is because the lava spewed slowly in this area – where the slope of the earth is less steep compared to the northern and southern parts. A map showing the distribution of Gotjawal Forest in Jeju-do Island, included in the paper of Song ^[17] can be seen here. <http://www.gotjawal.com>

Protection and development issues



Gloydius ussuriensis on Dong Baek Dong San →
Gotjawal Forest

As is seen from the three features of Gotjawal forest, it was difficult to develop this forest before modernization, as it is formed on quite rocky areas. That's why Gotjawal forest could keep its original ecology generally untouched by human activity. But beginning in the 1980s, it is now possible to develop the forest to establish golf courses and other tourist facilities, with the help of technology. And developing new tourist attractions is important for this island, which depends on the tourist industry.

With such threats to the ecology, a citizens' movement to protect Gotjawal forest arose on Jeju-do. "Gotjawal People [18]" is solely dedicated to the protection of Gotjawal forest. Half-million citizens of Jeju-do not only focus on the forest plants, but also on its critically important function of recharging and cleaning groundwater supply. People are aware that protecting Gotjawal forest is essential to the protection of groundwater, which is under threat from overuse for the agriculture and golf industries.

In fact, protecting Gotjawal forest contributes to protecting groundwater in two ways: (1) Gotjawal forest is an important groundwater recharging area. So, by protecting the forest, the groundwater can be recharged. (2) Golf courses use huge amounts of groundwater ^[19]. As golf courses are usually built in Gotjawal nowadays, we can protect the groundwater by protecting Gotjawal forest.

However, some parts of Gotjawal forest have already been developed. Some parts of the forest are now golf courses. By the end of 2005, there were already more than 16 golf courses on Jeju, and many golf courses are either under construction or in the planning stages. In addition, a location set for a famous TV drama, The Legend, was established on a part of the forest. Other tourist sites are also being planned in or near Gotjawal forest.

How much groundwater is used by golf courses and whether the present use of groundwater is sustainable is the subject of many hot debates. In data from 2002, we find documentation that water used for domestic purposes per day in Jeju is 634,864㎥/day, (43%), while water used for agricultural purposes per day is 800,565㎥/day (54%) ^[20]. These researchers referred to the report issued by KOWACO ^[21]. Water used by 16 golf courses during 2004 was 39,303 ton per day ^[22]. Environmental organizations say that golf courses

are the main cause of groundwater exhaustion and pollution ^[23] , but we do not yet know whether this is true or not.

In 2007, the Jeju Provincial Government established the "Gotjawal Trust [24]", supposedly dedicated to the protection of Gotjawal forest. Nonetheless the government has been criticized for allowing the construction of golf courses and other tourist facilities that are rapidly destroying Gotjawal.

In addition, a part of Gotjawal (Dong Baek Dong San, Camelia Forest) was designated as a Local Natural Monument in 1981 by Jeju's Provincial Government ^[25] . But the government has not paid much attention or budgeted necessary funds for research and education projects for Dong Baek Dong San forest.

Gotjawal Forest as an Internationally Important Wetland

Gotjawal Forest qualifies as Internationally Important Wetlands as designated by the Ramsar Convention on Wetlands ^[26] . And Gotjawal forest falls into the wetland type of Zk(b) karst and other subterranean hydrological systems ^[27] .

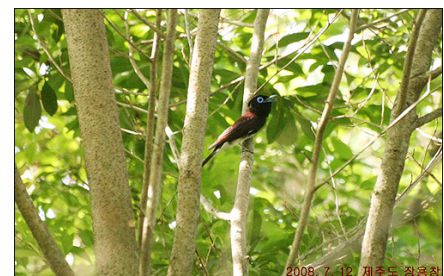
Ramsar Convention guidelines say that, "Regardless of genesis, these terms (karst and other subterranean hydrological systems) should be used to include all subterranean cavities and voids with water. Such sites would be eligible for inclusion in the Ramsar List whenever the site selection Criteria are fulfilled ^[28] ." This guideline further clarifies the definition of Wetlands by saying that "The Ramsar definition of wetlands (Article 1.1) should be read/understood to include surface and subterranean wetlands, although the Convention text does not explicitly refer to these systems. ^[29] .

When considering the essential function of Gotjawal forest in recharging and protecting groundwater - and the sole source of water for 500,000 people on Jeju - Gotjawal forest qualifies as Internationally Important Wetland according to the Ramsar Convention. In addition, Gotjawal forest qualifies as a Ramsar Site because of its unique forest ecology.

The Ramsar Convention requires that a wetland meet just ONE of the criteria suggested by the Convention in order to be considered an Internationally Important Wetland ^[30] . According to the above mentioned guidelines, Gotjawal forest qualifies on the basis of ALL of the following criteria ^[31] .

- Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region. (About Criterion 1, the Convention further explains ^[32] .)
- Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

Hydrological importance. As indicated by Article 2 of the Ramsar Convention, wetlands can be selected for their hydrological importance which, inter alia, may include the following attributes. They may: i) play a major role in the natural control, amelioration or prevention of flooding; ii) be important for seasonal water retention for wetlands or other areas of



Some population of Japanese Paradise Flycatcher breeds in Gotjawal Forest.

conservation importance downstream; iii) be important for the recharge of aquifer; iv) form part of karst or underground hydrological or spring systems that supply major surface wetlands;

Gotjawal forest in Jeju-do qualifies criterion 1, because it is an important area of groundwater recharge, as is explained by paragraph "Features of Gotjawal forest" of this article. And it qualifies the criterion 2, because it provides habitat for endangered species of fern, as is explained in paragraph 2^[33] of this article. In addition, Gotjawal forest is also a regular breeding site for endangered bird species, including the Fairy Pitta, *Pitta brachyura nympha*^[34], and Japanese Paradise Flycatcher, *Terpsiphone atrocaudata*^[35].

Footnotes

- [1] Jeju P. G., 1995
- [2] Song, 2000, p.116
- [3] Song, 2003, p.47
- [4] Jeong, 2004, p.41
- [5] Song, 2003; Jeong, 2004
- [6] <http://www.gotjawal.com>
- [7] Song, 2003, p.48
- [8] Yim, 2007, p.79
- [9] Yim, 2007, p.78
- [10] Press release form Korean Ministry of Environment (http://www.me.go.kr/dev/board/board.jsp?id=notice_03&mode=view&idx=14262)
- [11] Yim, 2007, p.1
- [12] KOWACO, 2003; (http://www.jejuwater.go.kr/sujawon/index3_3.jsp?pageNum=3)
- [13] Ko, 1997
- [14] Song, 2000, p.16
- [15] Song, 2000, p.20
- [16] Song et al 1996; Jeong, 2004, p.49
- [17] Song, 2000, p.20
- [18] <http://www.gotjawal.com>
- [19] Kim, 2006, p.35
- [20] Yun et al, 2006, p.55
- [21] KOWACO, 2003
- [22] Kim, 2006, p.35
- [23] Korean Federation for Environmental Movement (<http://english.kfem.or.kr/>)
- [24] <http://www.jejustrust.net>
- [25] Online Encyclopedia of NAVER (<http://100.naver.com/100.nhn?docid=736551>)
- [26] Jang et al, 2009, p.103
- [27] Ramsar Convention, 2009, B
- [28] Ramsar Convention, 2009, A, part VI. Guidelines for identifying and designating specific wetland types, paragraph 120
- [29] Ramsar Convention, 2009, A, part VI. Guidelines for identifying and designating specific wetland types, paragraph 128
- [30] Ramsar Convention, 1987, Article 2-2
- [31] Ramsar Convention, 2009 C
- [32] Ramsar Convention, 2009, paragraph-Guidelines for the application of the Criteria- criteria 1: 1d)
- [33] Yim, 2007, p.79
- [34] Kim, 2003, p.3
- [35] Oh et al, 2002, p.93

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External links

- Gotjawal People (<http://www.gotjawal.com>), NGO dedicated to protection of Gotjawal Forest
 - Gotjawal Trust (<http://www.jeutrust.net>), NGO supported by Jeju Provincial Government
 - Jeju Olle (http://www.jejuolle.org/eng/course/co_course.html?csno=11), trail route through Gotjawal forest developed for ecological tourism
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