

Analysis of Major Issues and Future Directions of ODA in Forestry in Korea: Application of Text Network Analysis

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Summary

The aim of this study is to examine the important issues that ODA projects in the forestry sector in Korea are generating, by targeting academic papers published in Korea. For this purpose, academic papers published in Korea between 2010 and 2021 were analysed. Of the papers published in academic journals by forestry researchers in Korea, ODA papers in the forestry field were extracted and a text network analysis method applied to them. As a result, five main topics were derived: goal-oriented aid project execution; the necessity for reviewing the long-term perspective in forestry ODA; the need to link to a profitable industry; the importance of a village-oriented production structure; and the necessity for forestry ODA to consider water resources and agriculture. In the future, it will be necessary to make efforts to reflect these five topics in the policy process.

Keywords: *Forestry ODA in Korea, Text Network Analysis, Forestry and Environment.*

1 Introduction

In developing countries, forests are being degraded and the forests are being used for various unnecessary purposes, because of poorly established policies on forests, resulting in particularly serious desertification (Bae et al., 2012; Ham and Min, 2015; Kim et al., 2013). This phenomenon also affects the livelihoods of the inhabitants of developing countries and indigenous peoples who depend on forests for their economic life. Forests in developing countries amount to around 2.2 billion hectares, of which around 22 per cent is managed by mountain villagers and indigenous peoples. Most of these residents are living in absolute poverty, making a living with below-average incomes, and are experiencing many difficulties arising from natural disasters caused by climate change (<https://www.forest.go.kr/kfswweb/kfs/idx/Index.do>).

In order to address these difficulties in the rural areas of developing countries, international organizations and advanced donor countries have for a long time now been implementing ODA in the forestry sector. Currently, major aid donors such as the UK, the USA, Germany and Japan are putting huge efforts into addressing social, economic and environmental issues in developing countries while implementing ODA in the forestry sector (Busse et al., 2009; Cartier-Bresson et al., 2006; Kang, 2014; Jang et al., 2015; Busse and Groning, 2019; Chang, 2019)). However, Korea is still far behind advanced donors in terms of the size and quality of its forestry ODA. Korea's policy know-how and technology levels in the forestry field are world-class, however, so it is necessary for Korea to expand the scale of its ODA in this field so that it can make a strong contribution to forest policy and forest conservation in developing countries.

Korea's forest policy has been promoted in earnest since the opening of the Korea Forest Service in 1966, and in the 1970s policy focused mainly on recovering degraded forests. From the 1990s onwards the policy objectives and policy

paradigms regarding forests began to change, with an emphasis on forest use, especially sustainable development, breaking away from the simple object of protection (<https://www.forest.go.kr/kfswweb/kfs/idx/Index.do>).

The focus of forest policy has also tended to shift from traditional recreational activities such as simple mountain climbing, landscape appreciation and forest bathing to gradually developing in connection with leisure sports such as mountain biking, paragliding, forest horseback riding, trekking and auto camping. In forestry, high-value-added industries, such as phytoncide extraction using leaves, have been activated, and policies on forests have changed due to sustainable forest development and use, which is viewed as a component of health promotion and disease prevention through the creation of a healing forest. In this process, the level of forest policy and of various technologies relating to forests has been raised, and if Korea supports developing countries more actively in the field of forestry ODA it will be able to make a large contribution in the field of international development co-operation.

In recognition of these issues, this study presents a text network on the research results for Korean researchers on ODA in the forestry field conducted in Korea between 2010, when Korea joined the OECD Development Assistance Committee (DAC), and end December 2021. Thereby, it is possible to explore the main issues that Korean researchers are dealing with regarding forestry ODA, and to explore the direction of ODA policy in the field of forestry in Korea.

2 Theoretical Discussion

Studies dealing with Korea's ODA in the field of forestry are very limited in number (Kan, 2014). The reason for this is that forestry represents an insignificant sector of Korean ODA and the number of projects being carried out is very small. As Table 1 shows, the size of forestry-sector ODA provided by Korea to developing countries was around \$7.6 million in 2015 and \$7.4 million in 2019, which is a much lower level than in 2015.

Table 1 ODA in Korea's forestry sector (by year)

| | 2015 | 2016 | 2017 | 2018 | 2019 |
|----------|----------|----------|----------|----------|----------|
| Donor(s) | | | | | |
| Korea | 7.618956 | 3.256903 | 8.443374 | 7.785957 | 7.412832 |

Source: OECD STAT (searching date, 12 November 2021).

Also, developing countries are actively demanding from donors fewer ODA projects in the forestry field than projects on other fields (Son, 2018; Choi et al., 2017; Chianca, 2008; Moyo, 2009). Developing countries are concerned with many urgent livelihood projects, so projects such as forestry are not considered first. Since Korea's ODA projects basically have to meet the demands of developing countries, it is only natural that the low-priority forestry sector is being neglected (Lim, 2019; Korea Forest Service, 2020). Nevertheless, in the long run, in view of the need to protect the forests of developing countries, which are now being degraded, and the need to create more forests to contribute to a healthy environment, ODA projects for developing countries will be in demand. Apart from this, providing sustainable aid in forestry has a very important meaning for Korea. Donor countries such as Korea should therefore actively raise problematic issues with the leaders of developing countries; they should provide aid on a larger scale, and at the same time provide aid in various forestry-related fields from a long-term, eco-friendly perspective (<https://www.forest.go.kr/kfswweb/kfs/idx/Index.do>).

In addition, co-operation with international organizations operating in the forestry field should be strengthened. Various such organizations with strong relations with Korea are currently active in the forestry field. We can mention first the UN's Food and Agriculture Organization (FAO). This organization is the largest UN agency in the fields of agriculture, forestry and fisheries, and has the aim of alleviating the world's food and hunger problems. It has a separate Forestry Division to manage international issues relating to forestry. Member countries, including Korea, review the implementation of its forestry-related programmes and discuss solutions to various issues via multilateral meetings such as those held by the Committee on Forestry (COFO) and the Asia-Pacific Forestry Commission (APFC)

(<https://www.forest.go.kr/kfswweb/kfs/idx/Index.do>).

The co-operation between the Korea Forest Service and FAO operates as follows. First, there is the forest landscape restoration mechanism project. This project, called the Forest and Landscape Restoration Mechanism (FLRM), was started in 2014 to support landscape and the restoration of deforested areas in more than twenty developing countries, based on Korea's successful forest reforestation experience, and has been operating ever since (Korea Forest Service, 2019). The project, which began with Korean seed funding, has succeeded in attracting the active participation of the international community and is now solidifying its position as a representative global forest restoration project (see the FLRM official website: fao.org/in-action/forest-landscape-restoration-mechanism/en/).

Another such organization is the Integrated Forest Disaster Risk Management (IFDRM) project. This project aims to support the establishment and operation of a systematic management system for forest disasters, especially in developing countries, since the numbers of forest-related disasters such as forest fires, forest diseases and pests, and landslides due to abnormal climates are rapidly increasing.

Then there is the Convention on Biological Diversity (CBD). This project is one of the three major UN environmental conventions and has a secretariat in Montreal, Canada. One hundred and ninety-six countries are Parties to it, their aim being to preserve biodiversity and the sustainable use of its components, in particular the fair and equitable sharing of benefits arising from genetic resources. The Korea Forest Service is carrying out various detailed projects for this project. Representative detailed projects include projects for forest ecosystem restoration. These projects were started in 2015 to support the conservation and restoration of forest ecosystems in developing countries around the world under the Biodiversity Strategic Plan and Biodiversity Goals (2011-2020) (FLRM official website: fao.org/in-action/forest-landscape-restoration-mechanism/en/). The CBD has supported workshops for capacity building by continent and the achievement of restoration goals in around ten countries. It is currently recognized as a representative science and technology co-operation programme that will implement the Post-2020 Global Biodiversity Framework (2021–2030).

In addition, Korea is a member of the UN Convention to Combat Desertification (UNCCD). This is one of the world's three major environmental conventions established to prevent desertification and protect the global environment via international financial and technical support for areas affected by land degradation brought about by drought and desertification. Via the UNCCD's biennial Conference of the Parties, the Republic of Korea, by launching and supporting co-operative projects such as the Peace Forest Initiative, is actively contributing to the international community's activities to prevent land degradation and desertification (<https://www.forest.go.kr/kfswweb/kfs/idx/Index.do>)

In addition, through the Peace Forest Initiative, Korea actively participates in projects that ultimately promote trust and peace, utilizing the non-political, long-term and public interest in forests to create and restore forests in border regions and multi-ethnic regions between countries.

3 Research Design

In this study, among the academic papers written by forestry researchers in Korea, papers dealing with ODA issues in the forestry field are extracted and analysed. The analysis period is limited to the years 2010–2021, Korea having joined the OECD DAC at the start of this period. The National Research Foundation (NRF), an academic support organization operating under the auspices of the Ministry of Education in Korea, manages research journals and also provides a database for research papers. This study operates in conjunction with NRF in that the research performance database possessed by NRF is to be utilized. The analysis program used in this study is Netminer 4.4, which has the advantage of being able to utilize the NRF research results.

Since there are not many research papers dealing with ODA in the forestry field, papers containing 'forestry' and 'ODA' in their title as keywords are extracted first. Next, we extract the papers that contain 'forestry' and 'ODA' as their overall keywords and analyse these keywords by integrating them into one file. As regards the analysis

procedure, cloud analysis, topic modelling analysis, connection centrality analysis, PFnet analysis, etc. of the abstracts of the extracted papers are performed first, so as to carry out trend analysis on ODA projects in the forestry field undertaken in Korea (Scott, 2012; Leavitt et al., 2009; Hansen et al., 2010).

4 Analysis Result

4.1 Cloud Analytics

There are a total of fourteen papers in which ‘forestry’ and ‘ODA’ are included as keywords in the title, and ‘forestry’ and ‘ODA’ are included as the main overall keywords of all these papers. It can be seen that there are not many papers dealing with ‘forestry’ and ‘ODA’ compared to those dealing with other research topics. A total of 472 keywords are included in the summary of the fourteen papers. Basic word-cloud analysis of these is shown in Figure 1.



Figure 1 Word-cloud analysis result

As Table 2 shows, the word that appeared the most was ‘forest’ (50 times), followed by ‘field’ (39 times) and ‘business’ (38 times).

Table 2 Frequency of occurrence of keywords

| | | 1 | 2 | 3 | 4 | 5 |
|----|-----|-------------|-----------|-------------|-------------|-------------|
| | | of Speech(F | Frequency | Word length | Name Type | uthor Keywo |
| 1 | 산림 | nmon Noun" | 50.0 | 2.0 | "-" | "False" |
| 2 | 분야 | nmon Noun" | 39.0 | 2.0 | "-" | "False" |
| 3 | 사업 | nmon Noun" | 38.0 | 2.0 | "-" | "False" |
| 4 | 개발 | nmon Noun" | 29.0 | 2.0 | "-" | "False" |
| 5 | 협력 | nmon Noun" | 28.0 | 2.0 | "-" | "False" |
| 6 | 농업 | nmon Noun" | 19.0 | 2.0 | "-" | "False" |
| 7 | 생산 | nmon Noun" | 18.0 | 2.0 | "-" | "False" |
| 8 | 한국 | roper Noun" | 17.0 | 2.0 | hical Name" | "False" |
| 9 | 씨감자 | nmon Noun" | 15.0 | 3.0 | "-" | "False" |
| 10 | 원조 | nmon Noun" | 14.0 | 2.0 | "-" | "False" |
| 11 | 목표 | nmon Noun" | 14.0 | 2.0 | "-" | "False" |
| 12 | 국제 | nmon Noun" | 14.0 | 2.0 | "-" | "False" |
| 13 | 조사 | nmon Noun" | 12.0 | 2.0 | "-" | "False" |
| 14 | 재배 | nmon Noun" | 12.0 | 2.0 | "-" | "False" |
| 15 | 임업 | nmon Noun" | 12.0 | 2.0 | "-" | "False" |
| 16 | 발전 | nmon Noun" | 12.0 | 2.0 | "-" | "False" |
| 17 | 전략 | nmon Noun" | 11.0 | 2.0 | "-" | "False" |
| 18 | 가능 | nmon Noun" | 11.0 | 2.0 | "-" | "False" |
| 19 | 방안 | nmon Noun" | 10.0 | 2.0 | "-" | "False" |
| 20 | 국내 | nmon Noun" | 10.0 | 2.0 | "-" | "False" |
| 21 | 환경 | nmon Noun" | 9.0 | 2.0 | "-" | "False" |
| 22 | 화훼 | nmon Noun" | 9.0 | 2.0 | "-" | "False" |
| 23 | 지속 | nmon Noun" | 9.0 | 2.0 | "-" | "False" |

4.2 Topic analysis

What problems do Korea's ODA projects relating to forestry cause, and what issues are relevant to the forestry-sector ODA provided by Korea? The study is able to answer these questions, because it makes it possible to know what issues have been involved in the ODA projects in the forestry sector that have been conducted to date, and thereby to suggest the future direction of ODA projects in the forestry sector provided by the Korean government. As a result of the topic analysis performed using the Netminer program, it can be seen that the major issues relating to ODA in the forestry sector in Korea divide into five groups, as shown in Figure 2.

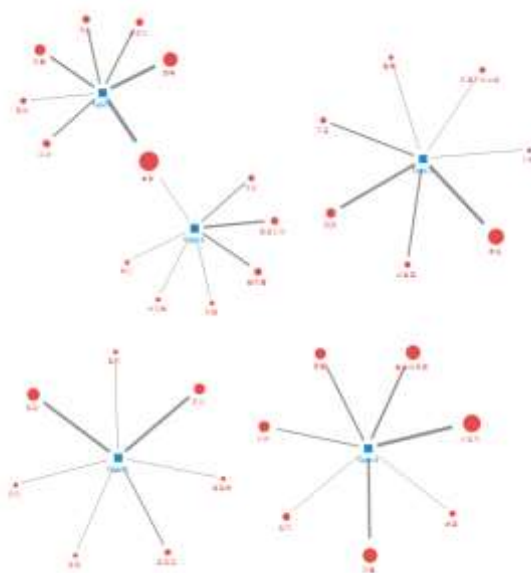


Figure 2 Five major topics

Below, we discuss each of the five topics individually. First, as indicated in Figure 3, Topic 1 consists of seven words: *goal*, *association*, *Kyrgyzstan*, *basic*, *item*, *forestry service* and *indicator*. Among these, the degree of connection between the goal and Topic 1 was the highest, at 0.135. This suggests the need for a national institution called the Korea Forest Service to set goals and supervise ODA in the forestry sector. Kyrgyzstan is included as a country that provides aid, suggesting that Kyrgyzstan is emerging as a representative country in providing ODA in the forestry sector. In other words, Topic 1 shows that countries such as Kyrgyzstan are representative countries in terms of receiving forestry-sector ODA from Korea, and that the Korea Forest Service provides aid with a focus on goals. If the donor country establishes aid policy on the basis of the target’s needs, the recipient country will also need to set the target in project implementation and execute the project according to the target to increase effectiveness.

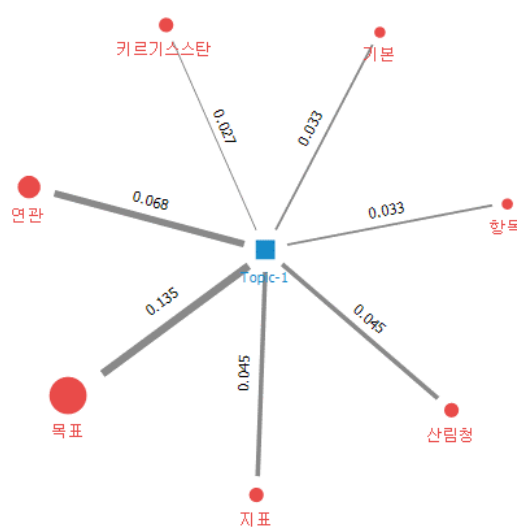


Figure 3 Topic 1: Goal-oriented aid project execution

Figure 4 shows Topic 2. Topic 2 consists of the words *perception*, *long-term*, *review*, *Finland*, *competitiveness*, *group* and *difference*. Topic 2 suggests that ODA in the forestry sector needs to be reviewed from a long-term perspective to

be competitive. In particular, these projects suggest that Finland is a benchmarking case. The topic suggests that the forestry sector should not be approached from a short-term perspective, but should be a policy direction that can enhance competitiveness in the long term.

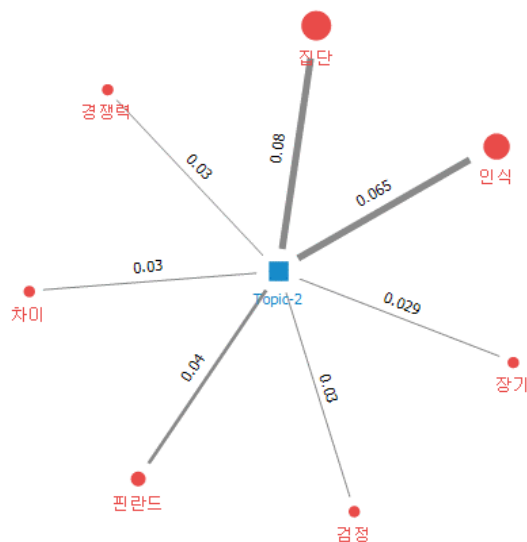


Figure 4 Topic 2: Requirement for long-term view

Figure 5 shows the configuration of Topic 3. Topic 3 consists of the words *agriculture, horticulture, crops, vegetables, seedlings, arable land* and *freshness*. An important point to be drawn from Topic 3 is the emphasis on the forestry sector's need to link with profitable products. Rather than simply fostering forestry, it is suggested that the structure should be made profitable by making products using cultivated land.

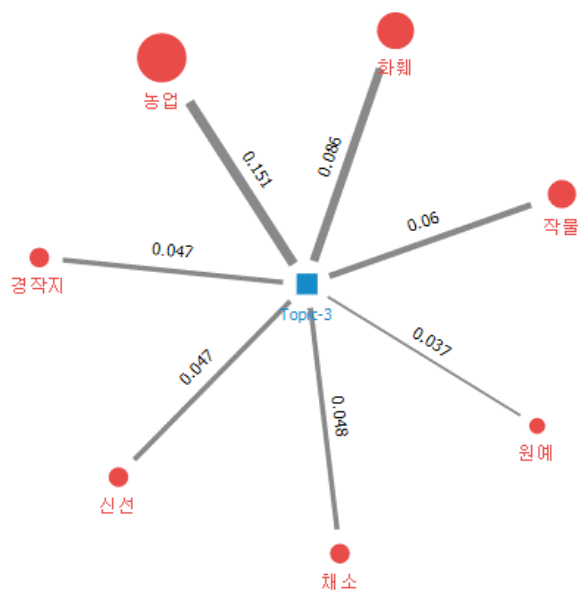


Figure 5 Topic 3: Necessity for linking to a profitable industry

As Figure 6 shows, Topic 4 consists of the words *El Salvador*, *seed potato*, *village*, *movement*, *potato*, *supply* and *issue*. This topic includes El Salvador as an aid target country, and as in Topic 3, the suggestion is that the aid project should be structured so that it is as profitable in terms of potatoes, with the village as the centre. The topic suggests that the village community, not the individual, should be at the centre in producing crops such as potatoes and connecting them with profits.

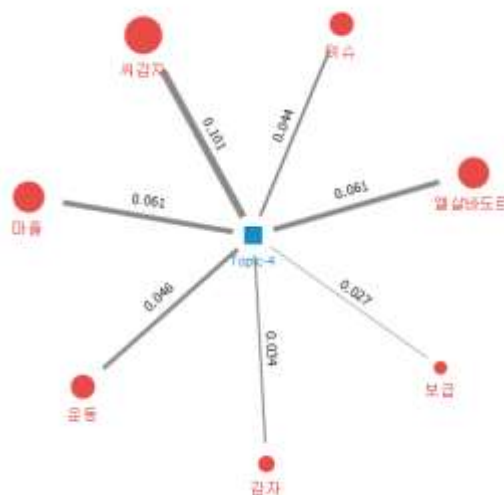


Figure 6 Topic 4: Importance of village-centred production structure

Figure 7 shows the structure of Topic 5. Topic 5 consists of seven words: *Cambodia*, *field crops*, *rainy season*, *provision*, *improvement*, *water resources* and *agriculture*. This topic includes Cambodia as a recipient country, and the important words it contains such as *agriculture*, *water resources* and *field crops* underscore the need to consider agriculture and water resources in fostering forestry, and at the same time to ensure that crops can be produced in the fields.

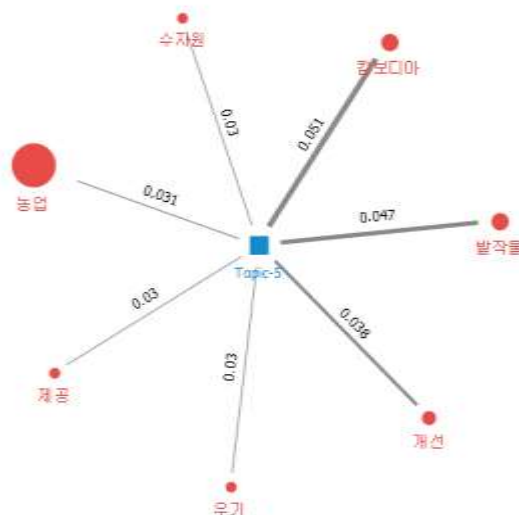


Figure 7 Topic 5: The necessity of ODA for forestry taking into account water resources and agriculture

4.3 Degree centrality analysis results

Table 3 shows the results from analysing the connection centrality of important words. The analysis of words that play a key role in the forestry ODA network structure indicates that those with the highest connection centrality are *crop* and *agriculture*: these have the highest connection centrality within the network structure, at 0.196970, meaning that they are the most influential words within the network. In other words, when it comes to providing ODA in the forestry field, it is desirable to provide an aid project that is related to agriculture rather than simply to cultivate forests, and to allow crops to be produced at the same time.

Table 3 Connection centrality score of keywords

| | | 1 | 2 |
|----|-------|----------------------|-----------------------|
| | | In-Degree Centrality | Out-Degree Centrality |
| 1 | 작물 | 0.196970 | 0.196970 |
| 2 | 농업 | 0.196970 | 0.196970 |
| 3 | 캄보디아 | 0.181818 | 0.181818 |
| 4 | 제공 | 0.181818 | 0.181818 |
| 5 | 우기 | 0.181818 | 0.181818 |
| 6 | 수자원 | 0.181818 | 0.181818 |
| 7 | 밭작물 | 0.181818 | 0.181818 |
| 8 | 개선 | 0.181818 | 0.181818 |
| 9 | 화훼 | 0.151515 | 0.151515 |
| 10 | 채소 | 0.151515 | 0.151515 |
| 11 | 원예 | 0.151515 | 0.151515 |
| 12 | 신선 | 0.151515 | 0.151515 |
| 13 | 경작지 | 0.151515 | 0.151515 |
| 14 | 항목 | 0.131313 | 0.131313 |
| 15 | 지표 | 0.131313 | 0.131313 |
| 16 | 연관 | 0.131313 | 0.131313 |
| 17 | 산림청 | 0.131313 | 0.131313 |
| 18 | 기본 | 0.131313 | 0.131313 |
| 19 | 목표 | 0.101010 | 0.101010 |
| 20 | 차이 | 0.090909 | 0.090909 |
| 21 | 엘살바도르 | 0.090909 | 0.090909 |
| 22 | 씨감자 | 0.090909 | 0.090909 |
| 23 | 보급 | 0.090909 | 0.090909 |

Figure 8 shows how keywords that can be important as regards determining and executing Korea's forestry ODA projects are interconnected. It indicates that it is possible to understand how one keyword is connected with other keywords, and how, through this, information on the priority that is required to implement the policy can be obtained. Topic analysis shows how numerous keywords relating to forestry ODA policy are classified into several topics, and

how the topics are grouped. The first argument presented by Figure 8 is that the Korea Forest Service promotes the forestry ODA project by setting goals with a sense of purpose. Therefore, developing countries that receive forestry ODA aid should set goals they can achieve using this aid, and carry out target-oriented aid projects when they have received the aid. Secondly, Figure 8 emphasizes that aid projects for forestry should generate agricultural products and other products in developing countries, and that this should lead to industry.

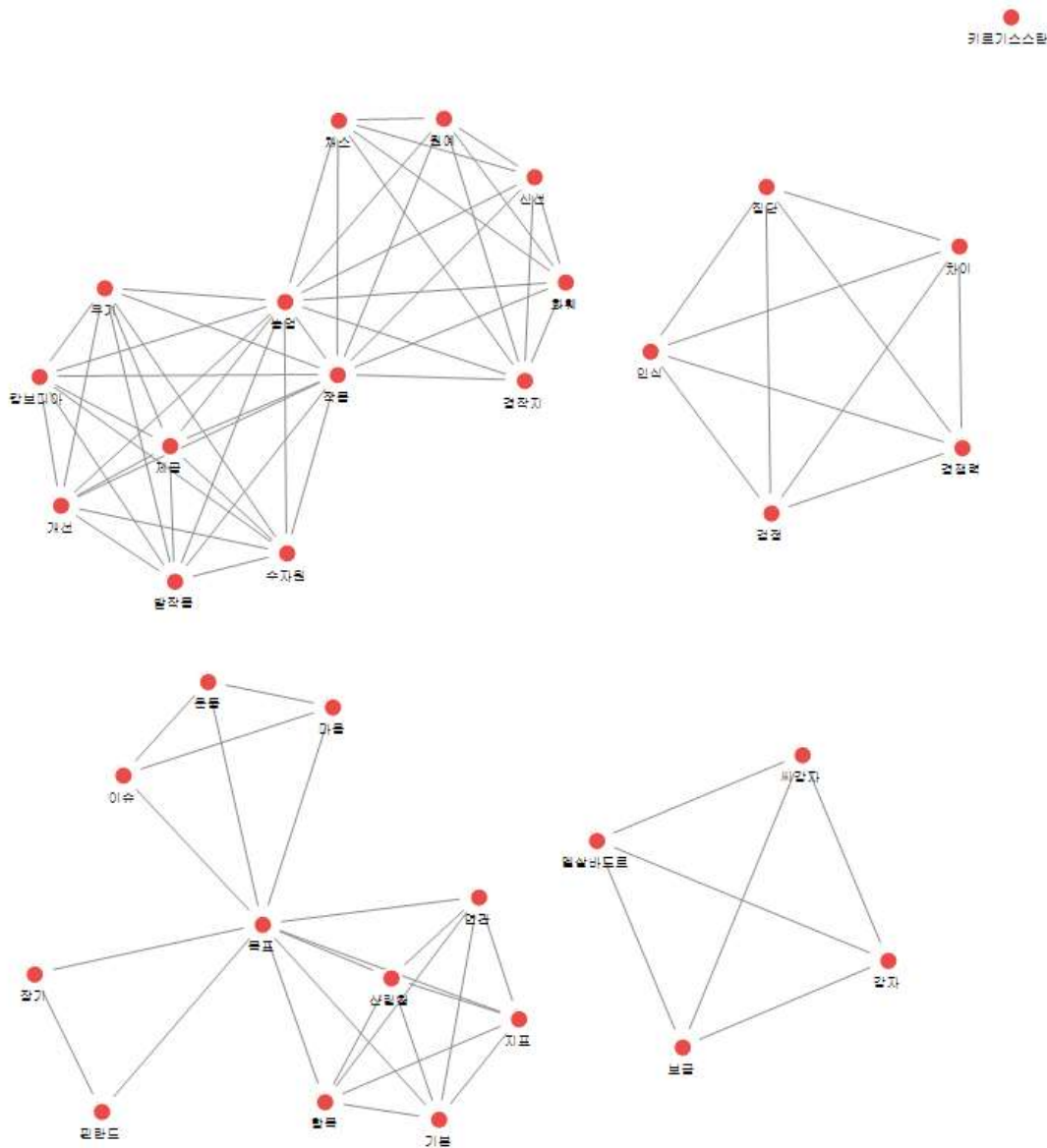


Figure 8 Analysis result of linkage between variables

5 Conclusion

This study has attempted to analyse what is becoming a particularly important issue relating to the aid project that Korea provides to developing countries in the forestry field. For this purpose, forestry-field ODA papers were extracted from among the papers published in academic journals by forestry researchers in Korea, and a text network analysis method applied to them. As a result, five main topics were derived: goal-oriented aid project execution; the necessity for reviewing the long-term perspective in forestry ODA; the need to link to a profitable industry; the

importance of a village-oriented production structure; and the necessity for forestry ODA that takes into account water resources and agriculture. These topics may be said to embrace the main issues in Korea's forestry ODA implementation.

The implications of this topic analysis are twofold. First, in continuing to strengthen its forestry ODA project in the future, it is necessary for the Korean government to evaluate and re-examine the major issues that have appertained so far. This means that it is necessary for it to objectively evaluate the positive and negative effects upon forestry of the major issues surrounding ODA. Second, the lessons learned from this analysis should be reflected in the forestry-related policymaking process, so as to strengthen Korea's forestry ODA in the future.

In conclusion: since joining the OECD DAC in 2010, Korea has been actively carrying out ODA projects that have been notable both in scale and quality, and has been attracting attention as a successful country in the forestry field. Korea should, in the future, play a more important role on the international stage by actively supporting developing countries through ODA in the forestry sector.

Acknowledgements: This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2019S1A5C2A03082775).

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