Defining Community Welfare Problems with DEMATEL Method

Sung-Hyun Park (first author, Mokpo National University)
Keun-Hwan Yoo (Taegu Science University)
Chang-Ho Yoo (corresponding author, Chonnam National University)

Abstract

Sung-Hyun Park / Keun-Hwan Yoo / Chang-Ho Yoo

This study attempted to understand the whole problem structure in Busanjin-gu, and clarify the casual relationship among the problems. Particularly, the study discerned the community problems impeding welfare improvement in Busanjin-gu in terms of community welfare, and structuralized the casual relationship perceived in terms of community welfare workers. This study then move to structuralizing the casual relationship perceived by workers for each social welfare center, playing a pivotal role in community based welfare regarding these community problems.

The major structural problems of the community welfare of the Busanjin-gu, Korea, are: 1) welfare budget allocation procedure is not logical, 2) the outskirts of the Busanjin-gu are isolated as poor areas, 3) geographic imbalance is severe among communities, and 4) the social welfare response system to support future population structure needs to be more developed. All of these problems are the fundamental origin to the social resource disparity within communities. More specifically, the isolation of impoverished areas triggered a regional imbalance and inadequate welfare service preparation for future demographic change, and as a result the gap between rich and poor regarding social resources increased.

주제어: 지역사회복지, 인과관계, 문제 구조

Keywords: Community Welfare, Cause and effect relationship, Problem Structure

I. Introduction

Recently, issues on welfare have been discussed in Korean society in terms of politics. This shows what Korean are anxious for. In South Korea, the agents, which provide welfare service, were altered in the early 1990s with the establishment of the local government system and the promotion of regionalization in the 2000s. In addition, the Korean social welfare policies tend to encourage decentralization and regionalization based on regional autonomy, citizen needs and resident participation.

With this background, a community has been a minimum unit, which can develop private resources and utilize these services through connection, to satisfy needs of community residents. As a practical measure, the establishment of a community welfare plan every 4 years was obligated through revision of the social welfare service act on July 7, 2003, and the second plan was established so far. However, some limitations have been arose in the process. First of all, planners ignored interrelationship among problems and subjectively established criteria of problems, while problems were reviewed based on current status of community welfare. This influences appraisals and alternatives, which causes conflicts among planners. Hence, executive force and efficiency of alternatives would deteriorate. Secondly, welfare plans have not reflected local characteristics in many local governments (Oh Jeonggun, 2008), and tend to be similar with other local welfare plans. Plans, do not take into account community context, cannot contribute to solving practical problems and they would be criticized as not plans for residents but display plan for administration.

For both effective analysis of community welfare tasks and preparation of enforceable alternatives, processes, which adjust opinions on other problems, seem to be necessary, and both agreement and objectification play a pivotal role in the process (Bae, Seungjong, 2010; Park, Sunghyun et al, 2011). This study is to investigate the whole structures of the complicated problems in terms of social welfare, and to clarify the mechanism and essence through DEMATEL method. Specific issues are involved in : (1) problems that hinder improvement of resident community welfare; (2) the

mindset of workers in community welfare; (3) the mindset of workers who play a pivotal role in different social welfare centers. This study intend to suggest an effective task analysis method for community welfare as a result, and be used basic data to prepare enforceable alternatives.

Ⅱ. Literature Review

1. Community Welfare

The traditional community was formed spontaneously or naturally, whereas the modern idea of community is one formed artificially or administratively, playing the role of a political unit. Problems in a community therefore become problems for the local government, with resident demands heading directly towards the local government.

In the context of community welfare, a community can be seen as the locus of social problems, a tool for change, and a place for public service(Bailey, 2002). It is an environment with problems, desires, and issues needing change, and a place where such change can occur through interactions between people and the distribution of power(Lee, Inhea, 2006: 194). It is the responsibility of local governments to provide the opportunities, measures, or means to effectively respond to such changes.

The concept of community welfare was originally based the assumption that a certain community was subject to interference and carrying out every social effort to diagnose, prevent, and resolve existing community problems. Thus, a community encompasses various community welfare activities by being acknowledged as a place subject to problems(Sanders, 2003; Lee, Inhea, 2006). Furthermore, community welfare has surpassed concepts of welfare categorized by area, such as income, housing, medicine and health, education, culture, traffic, and the environment, now focusing on dealing comprehensively with these area(Choi, Byungdu, 2008: 644~645).

Consequently, from the perspective of community welfare, a community problem is one related to welfare within the community, and arises in a

social, economic, and cultural context inseparable from community welfare. Community welfare is a broader concept than individual or family welfare, and is seen within the context of the community as a whole rather focusing on a specific target class such as the elderly, women, youth, or those with special needs. Korea made official community welfare planning mandatory for each region[1] on July 7, 2005 as a practical measure to implement community welfare.

2. Community Welfare Plan and Problem structuring

The first Community Welfare Plan was established and implemented between 2007 and 2010, with the second plan, for 2011 to 2014, with the third plan, for 2015 to 2018, established and currently being implemented. This plan attempts to diagnose current welfare demands and conditions in each region, determine the plans suited to each community through the participation of all community agents, and suggest comprehensive assignments by year and region. To guarantee the effectiveness and enforceability of these plans, it is important to correctly understand community context or problems inherent to the community. It is not easy to achieve this, however, as welfare problems manifest in complicated manners in different areas. Discussions on how to resolve these tasks must first be carried out.

Presently there are many variables to consider in complicated urban decision-making problems, and it is also difficult for the decision-maker to determine appropriate methods to solve such problems as the relationship between variables is complicated. These are normally called ill-structured problems, and to effectively solve such problems, there is a need to structuralize the problems where possible.

What is problem structuring then? Miyawaki(2003) defined it as acknowledging the essence of a problem to resolve a policy measure, structuring the elements of the problem, and acknowledging its character.

---

[1] The Community welfare plan is the official plan established by the Social Welfare Services Act, Article 15, Clause 3 or 6, the Enforcement Decree thereof, Article 6, Clause 2 or 4, and the Enforcement Regulations thereof, Article 6, Clause 2.

As this study takes a policy stance to resolve community problems in a broad manner, Miyawaki's(2003) definition, using the concept of structuring policy measures will be used.

3. Examining Precedents

There were many discussions in the early 2000s on community welfare research in Korea. This study focuses on research having a direct relationship to its purpose. These include research discussing the establishment, meaning, and direction of community welfare plans in Korea through analysis of those welfare plans used in Japan(Park, Taeyoung, 2003), research examining the political, economic, and social acceptability of community-based welfare systems(Kang, Daeseon, 2006), research analyzing community welfare plans established by local governments (Chung, Museong, 2006; Choi, Byungdu, 2008), and research using time-series analysis of welfare policies divided into two categories based on conditions and the substances of certain local governments from the perspective of community welfare(Ju, Sanghyun, 2010).

These discussions show that research on community welfare planning is largely carried out from three perspectives. The first is the model or direction of community welfare plans. The second is analysis based on comparison of different regions or research on specific areas using such key variables as vision, goal, elderly welfare, program, and foundation. The third perspective uses time-series analysis of local government community welfare plans.

Although research was carried out based on these viewpoints, research it was limited and short-sighted with plan establishment conducted by viewing community welfare as a residual concept. This result was caused from a limited specialist perspective in the approach to welfare, limiting any comprehensive understanding of community context including environment and social structure. This study views community welfare from an institutional perspective where community problems possess a prescriptive feature, and attempts to understand the mechanism of such problems by

considering community context.

Ⅲ. Current Conditions and Research Design

1. Environment Surrounding Community Welfare in Busanjin-gu

Busanjin-gu, Busan was selected as the sample district for this study. Because Busanjin-gu is a commercial center and traffic hub, with a co-existent impoverished zone, and a number of urban problems are seen in this district with welfare demand the highest in Busan.

Busanjin-gu has a commercial district centered on the Seomyun intersection, residential areas dispersed towards the mountain areas, and areas needing housing improvement primarily in the mountainous areas. Busanjin-gu has the highest welfare demand, with a range of housing culture grouped together in concentrated commercial, standard housing, and impoverished areas.[2] To improve deteriorating housing conditions, 92 entities and $5,377km^2$ was designated for the housing environment renovation project.[3] Due to real estate depression however, the renovation project has been extended over a long period of time, producing new kinds of social problems including crime, social branding issues, and network destruction, hindering the development of a pleasant housing environment.

Based on data from the end of 2012, Busanjin-gu's fiscal self-reliance ratio was 23.96% compared to the national rate of 52.5%, and among the 291,569 million won in expenditures, the social welfare budget was 143,772 million won, or 49.3% of the whole budget. With the welfare budget at 50% of expenditures, Busanjin-gu's fiscal operations are becoming burdened, contributing to it low fiscal self-reliance ratio. Although welfare appears to occupy a large proportion on the surface, 34.3% is used for the provision of

---

[2] Based on data from the end of 2012, the housing supply rate was 103.5%, and housing types comprised joint dwellings (60.2%) and single dwellings (39.8%).

[3] Housing development encompasses $4,637km^2$ with 62 entities, housing environment improvement districts encompass $346km^2$ with 20 entities, and housing renovation areas encompass $391.5km^2$ with 10 entities, with these areas comprising 18.1% of the whole of Busanjin-gu.

minimum living expenses, so the actual budget for use as general community welfare is limited. Therefore, compared to the large welfare budget, the reality is that sufficient funds are not able to be used to resolve the regional imbalance, impoverished area isolation, or reduction of the gap between rich and poor for social resources.

2. Social Welfare Center Playing a Pivotal Role in Community Based Welfare

Social welfare centers in Korea play a pivotal role in community based welfare. There are four social welfare centers in Busanjin-gu: the Gaegeum Social Welfare Center, the Danggam Social Welfare Center, the Busanjin-gu Social Welfare Center, and the Jeonpo Social Welfare Center, with each social welfare center having different areas of control, agent management, and operating method.

In the meanwhile, the visions of each social welfare center are abstract, with no differentiation with other social welfare centers, and the basis of such visions is suspect. It seems that the value of social welfare centers will improve only with a definite vision and strategies pursuant to that vision established through an accurate understanding of the characteristics and needs of the community members and community context(Table 1).

Table 1. Current social welfare center conditions in Busanjin-gu

Center name	Location	Date of Establishment	Employees	Management entity	VISION
Gaegeum	Gaegeum 3-dong	1995	31	Buddha Land	Conduct a professional social welfare service focused on clients through constant improvement
Danggam	Danggam 3-dong	1996	36	Catholic Church Busan Parish	Help create an attractive community, social integration, with change and innovation for social change
Busanjin-gu	Gaegeum 2-dong	1992	23	YMCA	Form a basis for self-reliance for low income earners, prevent and remedy community problems, improve welfare standards within the community
Jeonpo	Jeonpo1-dong	2002	32	Dong-Eui Educational Foundation	Form a regional, fulfilling, and happy community

In addition, individual programs such as community support and systemization through community resource networks are active, however, businesses related to employment or self-support among operating programs have little weight, occupying just 4.8% of the whole(Table 2).

Table 2. Current Social Welfare Center Conditions for Busanjin-gu

Center name	Number of programs	Programs per area
Gaegeum	65	Family welfare 56(16.7%), community protection 103(30.7%), community organization 103 (30.7%), education and culture business 54 (16.1%), self-support business 16 (4.8%), voucher business 4 (1.2%)
Danggam	87	
Busanjin-gu	117	
Jeonpo	67	

Source, Busanjin-gu, Busan, 2010, 'Busanjin-gu 'Community Welfare Plan No. 2, See p. 25.

Based on the data from 2012, 9,913 households received minimum living expenses, totaling 14,223 recipients, with 1,149 recipients living in Gaegeum 3-dong(10.2% of Busanjin-gu). Bujeon 2-dong had a relatively low number of recipients, at 246(1.7% of Busanjin-gu). 33,219(73.6%) of the elderly received a basic pension, and registered persons with disabilities were 18,796(4.5% of the whole population). The total number of welfare service recipients was 74,308, or 18.8% of the entire population. As can be seen, the demand for welfare is generally high in this area, and it is easy to see that the regional imbalance is a serious problem, based on differences in demand by district.

Social welfare related institutions in Busanjin-gu numbered 225, with the largest numbers located in Jeonpo-dong(16.5%) and Gaegeum-dong(17.7%), while the distribution was low in Bujeon 2-dong(0.4%), Beomjeon-dong(1.2%), and Danggam 2-dong(1.2%). Busanjin-gu operates well over the average number of social welfare institutions in Busan.

Examining social institutions by user, those for persons with disabilities number 30(11.8%), those for youth number 173(67.8%), there are 23 institutions for the elderly(9.0%), 8 women's institutions(3.1%), 2 institutions for low-income earners(0.8%), 3 for the homeless(1.2%), and

16 general purpose institutions(6.3%), illustrating that institutions for low-income groups and the elderly are relatively low in comparison with institutions for the youth and people with disabilities.

Meanwhile, government notice of programs operated by these institutions is rare outside the social welfare centers themselves, and overall information to residents is inadequate due to inactive program enforcement by private social welfare centers managed by an integrated resident service system.

3. Determining Community Problems

To determine community problems in Busanjin-gu from a community welfare perspective, four researchers uncovered 29 problems in 5 areas including community environment, social structure, residents, administration, and welfare service, by brainstorming after examining community welfare plans, statistical data, and media reports. These are listed in Table 3, below. In order to form a common understanding of these problems and finalize them, a basic survey was carried out by eight specialists from August 1st to August 2nd, 2011 to rate the significance of the 29 problems and winnow the list to 15 final problems.[4][5] The specialists determined that there were more problems in the social structure and community environment area than in administration or the programs. They seemed to recognize the necessity for resolutions through solidarity with other policies rather than seeking solutions limited to social welfare policy.[6]

---

[4] The survey was carried out by four social welfare studies professors at Dong-Eui University in Busan and four researchers at the Busan Social Welfare Development Institute.

[5] 29 community problems are integrated to 15 community problems to clarify analysis results to respondents. For that reason, respondents may feel that DEMATEL analysis surveys are complicated, as survey response time is excessive. It is not easy to procure an adequate number of samples. For instance, if questionnaires consist of 29 questions, respondents should answer 812 questions. In this case, the majority of respondents would give up the questionnaires. Hence, the integration plays a pivotal role in clarifying the essence and increasing sample in DEMATEL research.

[6] Modern community welfare shows complementarily community policy characteristics implemented in connection to areas of general public policy such as areas of income

Table 3. Busanjin-gu Community Problems From a Community Welfare
Perspective

Area	Problems	Average respondent score	Final Selection	
Community Environment	The re-settlement rate for residents is low due to frequent redevelopment and reconstruction.	3.3		
	There is a serious imbalance between regions.	3.9	●	P1
	There is no connection at all between the large Seomyun commercial facilities and community welfare service.	4.3	●	P2
	A large number of welfare demands are required overall.	3.5	●	P3
Social Structure	There is lack of cultural facilities.	4.1	●	P4
	The social welfare plans to prepare for future demographic change are inadequate.	4.0	●	P5
	Differential social resource problems are occurring within the district.	4.0	●	P6
	Isolation is occurring for impoverished areas on the outskirts of the district.	3.6	●	P7
	There is a high unemployment rate.	3.6	●	P8
Residents	There are many welfare recipients.	3.1		
	Active resident participation is difficult.	3.1		
	A lack of understanding exists among residents towards the community.	4.3	●	P9
	There are problems in forming horizontal relationships between welfare service suppliers and recipients.	3.0		
	A lack of information to residents on acquiring welfare resources.	4.0	●	P10
Administrative System	Welfare budget organization is not procedurally reasonable.	3.6	●	P11
	Partnerships with private entities are not smooth.	3.3		
	There are administrative problems in accessing welfare information.	2.6		
	There are limits to citizen participation when establishing community welfare plans.	3.3		
	There are limits to understanding welfare demands due to short-term surveys on needs.	4.1	●	P12
Welfare Service	There are limits to low-income group use of basic medical services.	3.0		
	There are problems with welfare facility accessibility by	3.0		

security, housing environment, health and medicine, education, culture, labor, and traffic communications.

public transportation.			
There is quantitatively a lack of social welfare facilities.	3.0		
The diversity of social welfare facilities is lacking.	3.6	●	P13
The labor force to supply welfare service is lacking.	3.5	●	P14
Welfare worker working conditions are poor.	3.5	●	P15
The welfare programs for each target group are not diverse enough.	3.4		
There are connection problems between welfare programs.	3.4		
There is lack of programs for low-income earners.	3.0		
There is lack of self-support programs.	3.0		

To understand the casual relationship between the finally determined problems, a survey was implemented via a matrix questionnaire, a part of DEMATEL analysis. The survey enquires into the direct influence a pertaining clause inflicts on other clauses. Using a causal relationship, rows indicate causes and columns indicate results, and depending on level of influence, a 6 point criterion comparative matrix was prepared, from 0 points(no relevance), 1 point(slightly irrelevant), 2 points(relevant), 3 points(slightly relevant), 4 points(deeply relevant), and 5 points(extremely relevant).

DEMATEL analysis can be useful for complicated or unclear relationships between elements and for the elements forming the problem, as well as for problems which cannot be analyzed by common methods. The most characteristic feature of DEMATEL analysis is that the method permits maximum use of the experience and intuition of those in close relationship to the actual problem or the advanced knowledge of a specialist in solving the pertinent problems (Momma, 2001). The survey was carried out between August 3, and September 2, 2013, for a period of four weeks. The survey was carried out by interviewers sufficiently acquainted with DEMATEL analysis. After the interviewers sufficiently explained the purpose of the survey, a summary of DEMATEL analysis, and cautions in entering survey data, the survey was filled out by respondents, and collected afterwards.

Table 4. General current respondent conditions

Category		Respondents		Category		Respondents	
Sex	Male	26	34.7%	Occupation	Social welfare public officer	5	6.7%
	Female	49	65.3%		Social worker	64	85.3%
Age	20s	25	33.3%		Civic activist	6	8.0%
	30s	36	48.0%	Social Welfare Center	Gaegeum Welfare Center	10	13.3%
	40s	13	17.3%		Danggam Welfare Center	7	9.3%
	50s	1	1.3%		Busanjin-gu Welfare Center	8	10.7%
Work period	Less than 1 year	11	14.7%		Jeonpo Welfare Center	13	18.7%
	1 to 5 years	28	37.3%		Other institutions	37	49.3%
	5 to 10 years	18	24.0%	Total number of respondents		75	100.0%
	More than 10 years	18	24.0%				

Survey subjects were limited to those working in fields related to community welfare, with the current condition shown in Table 4 below. A total of 75 persons responded, with 26(34.7%) men and 49(65.3%) women. By age 25(33.3%) respondents were in their 20s, 36(48.0%) in their 30s, 13(17.3%) in the 40s, and one(1.3%) person in their 50s. Regarding work experience, 11(14.7%) people had less than 1 year of experience, 28(37.3%) had between 1 to 5 years' experience, 18(24.0%) had 5to 10 years' experience, and 18(24.0%) had over 10 years' experience. By job, 5(6.7%) were public social welfare officers, 64(85.3%) were social workers, and 6(13.3%) civic activists. Regarding responses by social center, 10(13.3%) were from Gaegeum Social Welfare Center, 7(9.3%) from Danggam Social Welfare Center, 8(10.7%) from Busanjin-gu Social Welfare Center, and 18(18.7%) from Jeonpo Social Welfare Center, with 37(49.3%) others from other institutions.

4. DEMATEL Analysis Method

The decision making trail and evaluation laboratory(DEMATEL) method is a mathematical procedure originated from the Geneva Research Centre of the Battelle Memorial Institute designed to deal with important issues of world societies(Gabus A & Fontela E, 1973). The DEMATEL possesses

some excellent features. For example, it is based on matrices that represent the contextual relation as well as strength of influence of the elements for the target system. It converts the cause-effect relationship of elements into visible structural models. With its practical benefits, the DEMATEL has been widely applied in various fields, such as marketing(Shieh J-I et al, 2010.; Tseng M-L, 2009), education(Chen J-K & Chen I-S, 2010), investment(Jerry Ho W-R et al., 2011), supply chain management(Chang B et al., 2011), smart phone(Hu SK et al, 2012), and influential factors(Yang WT et al, 2013). The DEMATEL method has advantages that help researchers better understand the nature of the problem.[7]

Mathematically, the procedures of DEMATEL are narrated step-by-step as follows(Park, Sunghyun et al, 2011: 330~332).

Step1-the process of generalization is carried out by entering a direct relation matrix acquired through survey. The materials are collected in the form of N×N, and after determining the average for each clause, a direct causal relationship is generalized.

Step2-the normalization process for the direct relation matrix is carried out. The researcher seeks the sum of each row, and normalizes after dividing the sum of the rows with the largest value. The largest value of the sum of rows does not exceed 1. The normalized direct relationship matrix X is calculated in the form of the formula below (2).

$$k = \frac{1}{\max \sum_{j=1}^{n} a_{ij}}, \ i, \ j = 1, \ 2, \ldots, n. \ \text{------}(1)$$

$$X = k \times A \ \text{----------------------}(2)$$

Step3-the total-relationship matrix process is carried out. The total-relationship matrix (T) is the same concept as the inducement coefficient for an input-output model, referring to the entire effect

---

[7] As this method visualizes the structure of complicated casual relationships via directed graph theory and matrixes, it is of particularly practical use (Fontela, E. and Gabus, A., 1976). As it uses a matrix expressing level of influence in numbers and a directed graph describing the contextual relationship between system elements, the relationship between criteria cause and effect can be accurately understood.

considering the cycle. Here, the symbol I means identity matrix.

$$T = X + X^2 + X^3 + \cdots X^m = X(I - X)^{-1} \text{------(3)}$$

Step4-the assessment indicator computation and analysis process is carried out. The total-relationship matrix, T, uses formula (4) below.

$$T = \left[t_{ij} \right]_{n \times n}, i, j = 1, 2, \cdots, n \text{------(4)}$$

$$D = \left[\sum_{i=1}^{n} t_{ij} \right]_{n \times 1} = \left[t_i \right]_{n \times 1} \text{------(5)}$$

$$R = \left[\sum_{j=1}^{n} t_{ij} \right]_{1 \times n} = \left[t_j \right]_{n \times 1} \text{------(6)}$$

The sum of rows (D) for the total-relationship matrix T indicates the degree of effect, or degree of cause that each problem occupies in the whole problem, and the sum of columns (R) is the reverse-effect degree, or degree of cause for pertaining problems through the collection of all problems. Here, D+R ('Prominence') means the importance of the pertaining problem concerning the entire problem regardless of the cause of the result. D-R ('Relation') becomes an indicator showing whether the pertaining problem becomes a cause or a result for the whole problem. Thus, if D-R is higher than 0 (D-R>0), the dispatcher's character is strong, but if D-R is less than 0 (D-R<0), the receiver's character is strong. Through 'Prominence' and 'Relation', the structure of the complicated causal relationship is visualized as a directed graph.

Ⅳ. Structuralizing Community Problems from a Community Welfare Perspective

1. Comprehensive Relationship between Main Problem Items in Busanjin-gu

The total-relationship matrix is the same concept as the inducement

coefficient for an input-output model, which considers the entire effect of
the cycle. It thus considers the direct and indirect casual relationships. By
analyzing the direct relationship matrix attained by DEMATEL analysis,
and after undergoing the process of generalization and normalization, a
total-relationship matrix has been determined, as in Table 5.

Table 5. Total-relationship matrix(T), 'Prominence' (D+R) and 'Relation' (D-R)

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	D	R	D+R	D-R
P1	0.681	0.623	0.679	0.614	0.742	0.768	0.722	0.605	0.677	0.694	0.696	0.677	0.694	0.696	0.700	10.267	10.175	20.442	0.092
P2	0.629	0.463	0.558	0.515	0.615	0.635	0.598	0.501	0.560	0.583	0.569	0.552	0.573	0.574	0.575	8.500	8.357	16.857	0.143
P3	0.690	0.561	0.561	0.562	0.687	0.699	0.659	0.549	0.621	0.644	0.648	0.628	0.638	0.639	0.650	9.434	9.120	18.555	0.314
P4	0.610	0.501	0.549	0.444	0.602	0.609	0.574	0.478	0.543	0.576	0.558	0.539	0.558	0.562	0.558	8.261	8.243	16.504	0.018
P5	0.731	0.599	0.657	0.593	0.658	0.738	0.697	0.587	0.667	0.690	0.682	0.662	0.678	0.680	0.686	10.005	10.096	20.101	-0.091
P6	0.749	0.607	0.670	0.597	0.732	0.673	0.710	0.596	0.668	0.686	0.675	0.653	0.682	0.685	0.688	10.070	10.249	20.319	-0.180
P7	0.772	0.623	0.691	0.617	0.753	0.778	0.654	0.612	0.687	0.709	0.700	0.676	0.704	0.708	0.704	10.388	9.652	20.039	0.736
P8	0.646	0.523	0.584	0.513	0.632	0.651	0.615	0.460	0.575	0.591	0.583	0.566	0.585	0.585	0.587	8.695	8.099	16.795	0.596
P9	0.743	0.602	0.659	0.599	0.736	0.746	0.705	0.589	0.602	0.695	0.689	0.672	0.675	0.675	0.682	10.069	9.174	19.244	0.895
P10	0.684	0.567	0.609	0.557	0.684	0.680	0.644	0.537	0.618	0.577	0.634	0.612	0.630	0.633	0.635	9.301	9.521	18.823	-0.220
P11	0.685	0.571	0.616	0.553	0.692	0.689	0.648	0.540	0.624	0.650	0.578	0.637	0.642	0.645	0.652	9.421	9.404	18.824	0.017
P12	0.634	0.528	0.572	0.516	0.643	0.641	0.602	0.510	0.580	0.610	0.613	0.521	0.596	0.597	0.604	8.767	9.109	17.876	-0.342
P13	0.634	0.527	0.569	0.519	0.632	0.646	0.605	0.508	0.580	0.600	0.589	0.572	0.536	0.617	0.605	8.737	9.404	18.141	-0.666
P14	0.624	0.516	0.560	0.506	0.616	0.630	0.592	0.499	0.559	0.585	0.571	0.549	0.593	0.524	0.584	8.506	9.441	17.947	-0.935
P15	0.664	0.545	0.588	0.538	0.672	0.668	0.628	0.528	0.613	0.632	0.618	0.596	0.621	0.620	0.562	9.094	9.472	18.566	-0.378

At least 0.740   At least 0.720 Less than 0.740   At least 0.700 Less than 0.720

First, when examining D, which indicates the degree of cause occupying
each problem item in the whole problem structure, P7(10.388) appeared to
be the most important cause among the current community welfare
problems in Busanjin-gu, with P1(10.267), P6(10.070), P9(10.069), and
P5(10.005) following. These were the most fundamental community
problems, which must be handled to resolve the main causes stated above.
When examining R, which indicates the degree of results occupying each
problem item among the whole problem structure, P6(10.249) appeared to
be the most important result, with P1(10.175), P5(10.096), P7(9.652), and
P10(9.521) following. These are the realistic problems currently appearing
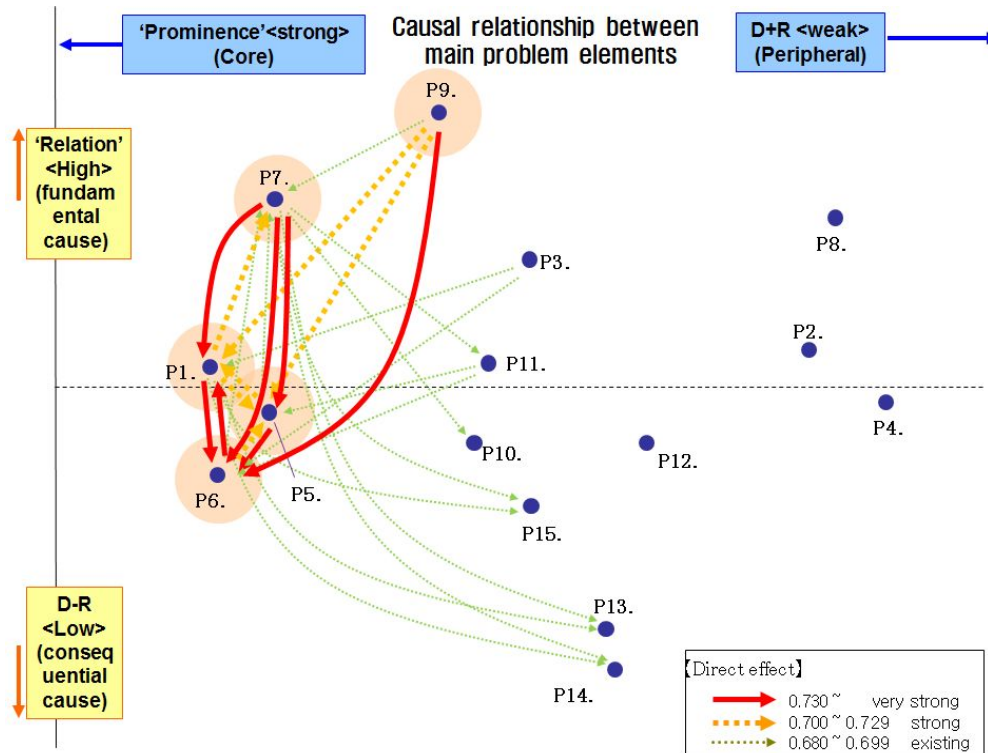
at Busanjin-gu.

Figure 1. Directed Graph of Problem Elements

Next, the 'Prominence' (D+R) and 'Relation' (D-R) for each task was determined depending on the total-relationship matrix. As stated above, the 'Prominence' indicates how central the role of the pertaining problem is in the problem structure, and the 'Relation' indicates the level of influence inflicted on other items and degree of application of the cause when the value is high. Figure 1 illustrates the direction between items and the location of each problem respectively on the X axis and Y axis on a X-Y coordinate system.[8] The analysis showed that, regarding the 'Prominence' (D+R), P1(20.442) is the most central problem, with P6(20.319), P5(20.101), P7(20.039), and P(19.244) following. As these problems are central in a comprehensive perspective considering both cause and result,

---

[8] directions of arrows mean that a factor directly influence another factor, and the thickness means degree of the influence (strong / weak).

an alternative is required to maximize the effects of improvement. Regarding 'Relation' (D-R), P9(0.895) appeared to be the problem with the strongest 'Dispatcher' character, with P7(0.736), P8(0.596), P3(0.314), P2(0.143) following. Conversely, P14(-0.935) exhibited the strongest 'Receiver' character, with P13(-0.666), P15(-0.378), P12(-0.342) following.

When viewing the problem structure from a comprehensive perspective, the main community problems reflected by Busanjin-gu's community welfare perspective is that the isolation phenomenon of impoverished areas on the outskirts of Busanjin-gu (P7) increased the gap in social resources between the rich and poor (P6) within the district. More specifically, the isolation phenomenon (P7) triggered an imbalance of regions (P1) and inadequate social welfare planning to prepare for future demographic change (P5). As a result, the social resource distribution between the rich and poor has increased (P6). Moreover, the lack of resident understanding of the community (P9) appeared a direct cause triggering unequal social resource distribution between the rich and poor (P6). As can be seen by the graph, the regional imbalance structure (P1), inadequate plans to prepare for future demographic change (P5), and unequal distribution of social resources between the rich and poor (P6) is circular, meaning that the elements influence each other.

To resolve the community problems in Busanjin-gu, careful consideration of how to resolve the most fundamental and central problem of impoverished areas on the outskirts of Busanjin-gu(P7), at a policy level, should be a priority.

The central problem structure examined by the directed graph indicates a declining pattern toward the left, showing that problem solving recognized by Busanjin-gu community welfare workers is unclear.[9] A clear problem solving structure shows a declining pattern towards the right, meaning that moving from core and fundamental problems to peripheral and consequential problems is more useful in developing a systematic approach and

---

[9] DEMATEL is useful to draw priority of problems logically in terms of solving the complicated community problems. In other words, DEMATEL is useful the way that first of all, the most underlying problem should be solved, and surrounding problems are increasingly dealt with.

determining problems solving priority.

2. Analyzing Differences in Mindset by Social Welfare Center

Next, the differences in social welfare centers mindsets was examined, which play a pivotal role in implementing community resident welfare improvement. Because workers at social welfare centers focus on practical matters in the field, they are more aware of community problems than others. The mindset of each social welfare center was analyzed using 38 of 75 direct relationship matrixes, to which social welfare center workers responded.

1) Analysis of the Busanjin-gu Social Welfare Center Mindset

The result of analyzing the problem structuring perceived by social workers at Busanjin-gu Social Welfare Center are as follows.
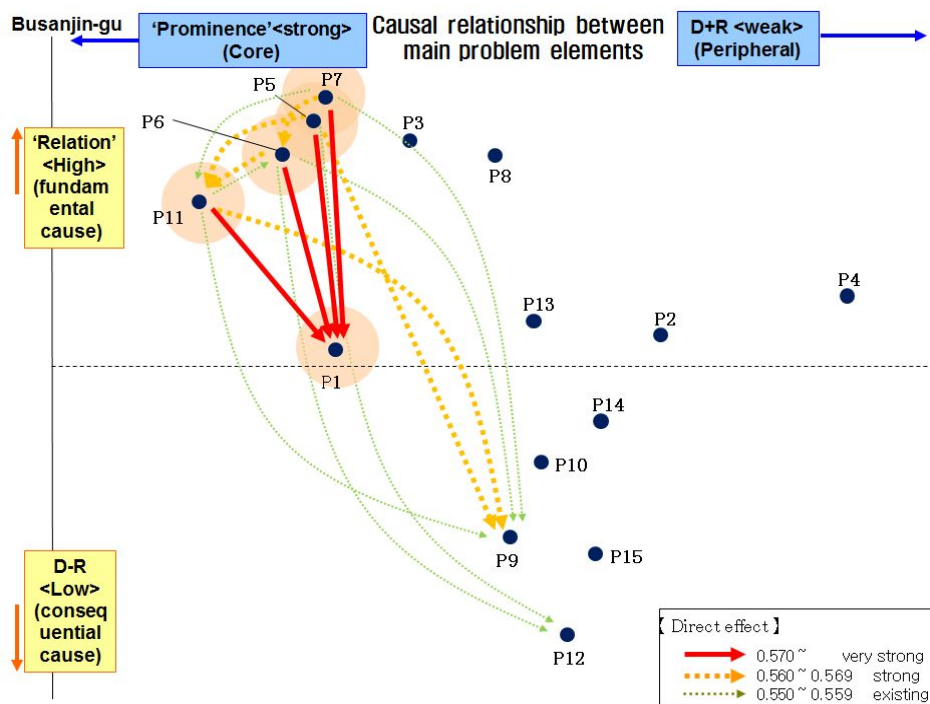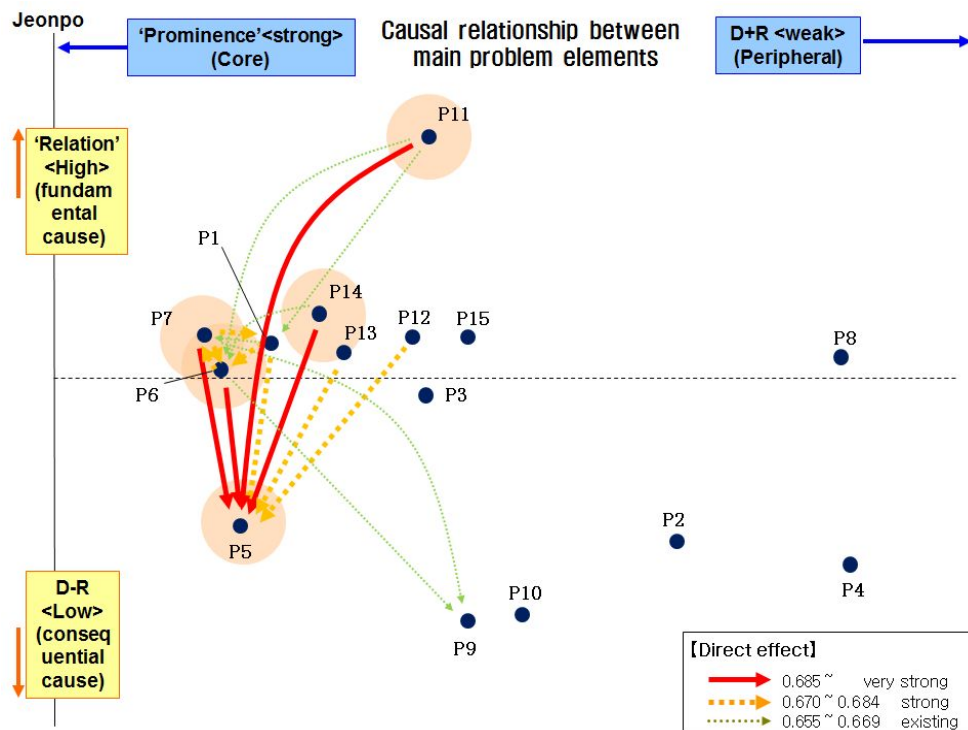

Figure 2. Directed Graph of Problem Elements
(Busanjin-gu Social Welfare Center)

When examining the problem structure from a comprehensive perspective, the Busanjin-gu Social Welfare Center workers regarded the main problem to be inadequate welfare plans for the future demographic change(P5), isolation of impoverished areas on the outskirts of the district(P7), the increased the gap between the rich and poor due to social resources(P6), and the lack of understanding of residents on the community(P9), triggering imbalance among regions(P1). As a result, Busanjin-gu Social Welfare Center must develop and operate programs which can prepare for future demographic change, to alleviate impoverished areas, properly distribute social resources, and enhance community understanding.

2) Analysis of the Jeonpo Social Welfare Center Mindset

The results of analyzing problem structuring perceived by social workers at Jeonpo Social Welfare Center are as follows.
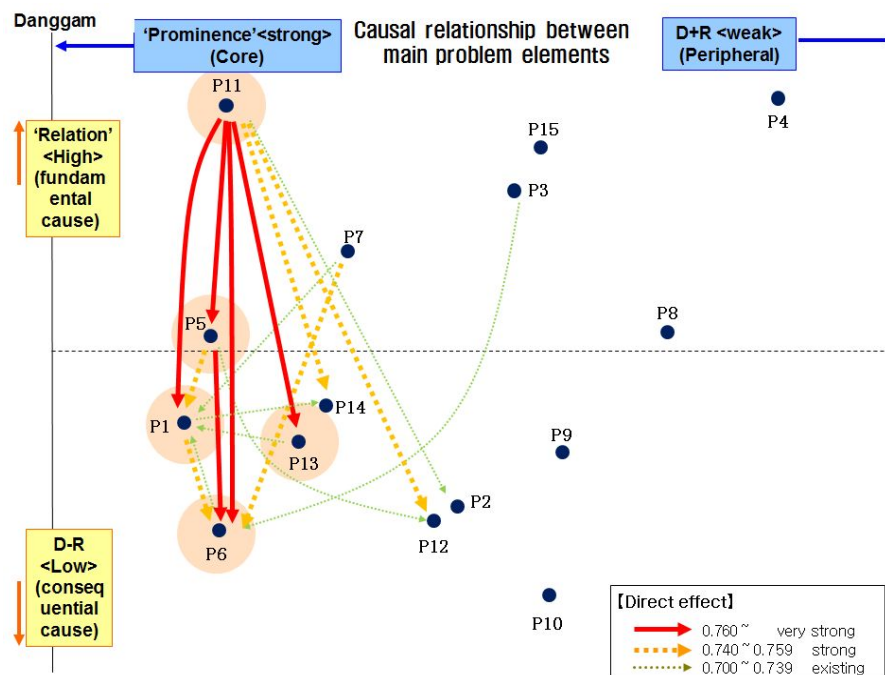
Figure 3. Directed Graph for Problem Elements
(Jeonpo Social Welfare Center)

When examining the problem structure from a comprehensive perspective, Jeonpo Social Welfare Center workers regarded the main problems to be isolation of impoverished areas on the outskirts of the district(P7), procedurally unreasonable distribution of welfare budgets(P11), increased gap between rich and poor regarding social resources(P6), and a lack of understanding of residents towards the community(P9), triggering the problem of failing to prepare for future demographic changes(P5). Moreover, the imbalance of regions(P1), isolation of impoverished areas on the outskirts(P7), and increased gap between rich and poor regarding social resources(P6) exhibited a circular relationship. As a result, Jeonpo Social Welfare Center needs to develop and operate programs to alleviate impoverished areas, effectively distribute social resources, and enhance community understanding.

3) Analysis of the Danggam Social Welfare Center Mindset

The results of analyzing problem structuring perceived by Danggam Social Welfare Center social workers are as follows.

Figure 4. Directed Graph for Problem Elements
(Danggam Social Welfare Center)

When examining problem structure from a comprehensive perspective, the Danggam Social Welfare Center workers regarded the main problems to be a lack of resident understanding of the community(P9), which resulted in regional imbalance(P1), lack of social welfare resource information acquired by residents(P10), inadequate preparation for future demographic changes(P5), and increased gap between the rich and poor regarding social resources(P6). More specifically, the lack of understanding of residents on the community(P6) triggered welfare service problems failing to respond to future demographic changes(P5), and as a result, the gap between the rich and poor regarding social resources(P6) has increased. Thus, Danggam Social Welfare Center needs to develop a fundamental and core program permitting residents to understand the community.

4) Analysis of the Gaegeum Social Welfare Center Mindset

The analysis results of problem structuring understood by Gaegeum Social Welfare Center workers are as follows. When examining the problem structure from a comprehensive perspective, the Gaegeum Social Welfare Center workers regarded the main problems to be regional imbalance(P1), triggering an increased gap between rich and poor regarding social resources(P6). More specifically, due to the regional imbalance(P1), the isolation phenomenon of impoverished areas appeared(P7), causing an increased gap between the rich and poor regarding social resources(P6). As a result, Gaegeum Social Welfare Center must first concentrate on developing programs to resolve regional imbalances.
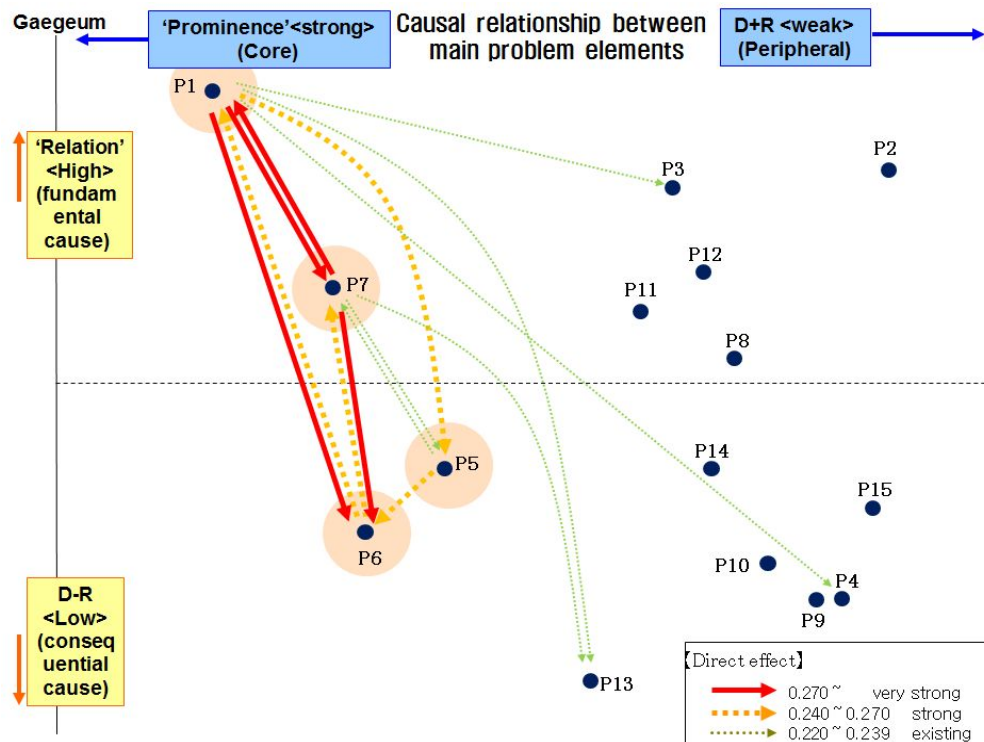
Figure 5. Directed Graph of Problem Elements
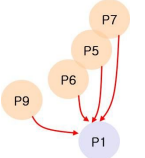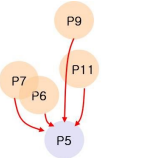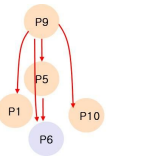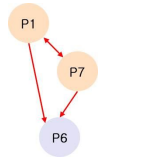(Gaegeum Social Welfare Center)

5) Comparing Social Welfare Centers

The mindset structure by social welfare center was examined thus far, showing clear differences as summarized in ⟨Table 6⟩ below. This shows that perceived problems differ by social welfare center control area. These different mindsets show practical problem recognitions that social workers experience. For instance, local imbalances are caused by isolation of suburb poor areas in Gaegum 2 dong that social welfare center governs in Busanjin-gu. However, both local community welfare plans and programs in social welfare center do not take these issues into account, and provide strategy and program uniformly.

To guarantee the effectiveness and enforceability of these plans, it is important to correctly understand community context or problems inherent to the community. In light of these, social welfare center should clearly understand local problems and issues, and programs should be developed and provided based on the problems and issues. In addition, local social

welfare plan should suggest detailed strategies in order for social welfare center to perform suitable programs for local areas. If more effective and enforceable programs are provided, a qualitative improvement of welfare service delivered to the residents in the controlled area will be seen.

Table 6. Comparative Analysis of Social Welfare Centers

	Busanjin-gu Social Welfare Center	Jeonpo Social Welfare Center	Danggam Social Welfare Center	Gaegeum Social Welfare Center
Main Structure				
Form	Declining to the right	Declining to the left	Declining vertically	Declining to the right
Priority Assignments	Isolation of impoverished areas on the outskirts of the district	Lack of understanding of community	Lack of understanding of community	Problems of regional imbalance

Ⅴ. Conclusions and Implications

In modern Korean society, community welfare is carried out in the form of decentralized autonomic-welfare, with a policy-focused approach through the resident participation, resident desires, and regionalization(Lee, Inhea, 2006). In this context, this study has attempted to understand the whole problem structure of Busanjin-gu district and clarify the casual relationship between the problems. More specifically, the study discerned the community problems impeding welfare improvement in Busanjin-gu from a perspective of community welfare. It then structuralized the casual relationship perceived by community welfare workers. And finally, it structuralized the casual relationship perceived by workers for each social welfare center, playing a pivotal role in community based welfare regarding these community problems.

In summary, First - a total of 15 problems impeding welfare improvement

were determined from a community welfare perspective by categorizing them as community environment, residents, administrative system, and welfare service.

Second - DEMATEL analysis showed the main problem structure perceived by community welfare workers was that due to the isolation phenomenon of impoverished areas on the outskirts of Busanjin-gu, causing the gap between rich and poor regarding social resources to increase. More specifically, the isolation of impoverished areas triggered a regional imbalance and inadequate welfare service preparation for future demographic change, and as a result the gap between rich and poor regarding social resources increased.

Third - in examining each social welfare center's mindset, Busanjin-gu Social Welfare Center indicated that inadequate preparation of welfare services for future demographic changes, isolation of impoverished areas, the gap between rich and poor in social resource distribution, and lack of understanding of residents on the community caused regional imbalance. Jeonpo Social Welfare Center indicated that the isolation of impoverished areas, procedurally unreasonable distribution of welfare budgets, the gap between rich and poor regarding social resources, and lack of understanding of residents on the community caused inadequate preparation of social welfare services for future demographic changes. Danggam Social Welfare Center indicated that the lack of understanding of residents on the community caused regional imbalance, lack of information on welfare resources to residents, inadequate preparation of welfare services for future demographic changes, and increase of gap between rich and poor regarding social resources. Finally, Gaegeum Social Welfare Center indicated that the regional imbalance triggered the increase in gap between rich and poor regarding social resources. As can be seen, the different social welfare centers mindsets indicate that the priority on area of control for each center differs. Based on this data, each center should thus develop and provide prioritized and concentrated programs when developing programs or visions.

This study has the following policy implications. First, The results of this study indicated that community welfare problems have a high correlation

with community problems, and must as a result, be connected with the policies of other sectors. An effort to approach community problems from a broad perspective is required instead of viewing them from a narrow perspective. Second, For effective community welfare task analysis and to prepare enforceable alternatives, an opinion mediating process is required for the different problems that residents are actually experiencing, with the best method for this process being agreement and objectification. This study applied DEMATEL, which can draw agreement of local problem and objectification, and verified the fact that it can be applied to the development of both programs of social welfare center and strategy of local social welfare plans. Third, By defining community problems, there is a need to prioritize solutions, because in all administrative matters, social and physical resources must be invested, which must be used efficiently and effectively.

References

Bae, Seungjong. (2010). Quantitative Analysis for Problems and Improvement Directions of the Comprehensive Rural Village Development Projects using DEMATEL and Contents Analysis. *Journal of Korean Society of Rural Planning,* 16(3): 173-184.

Bailey Darlyne & Kelly McNally Koney. (2002). Interorganizational Community-Based Collaborative: A Strategic Response to Shape the Social Work Agenda. *Social Work* Vol. 41.

Busanjin-ku. (2010). *Community Welfare Plan – Based on 2st Community Welfare Planning at Busanjinku.*

Chang B, Chang C-W, Wu C-H. (2011). Fuzzy DEMATEL method for developing supplier selection criteria. *Expert Systems with Applications,* 38(3): 1850-1858.

Chen J-K, Chen I-S. (2010). Using a novel conjunctive MCDM approach based on DEMATEL, fuzzy ANP, and TOPSIS as an innovation support system for Taiwanese higher education. *Expert Systems with Applications,* 37(3): 1981-1990.

Choi, Byungdoo. (2008). Community-based Welfare and Policy Tasks for rural

Areas in Korea: A Case Study of Koryung Gun, Kyungsangbukdo. *Journal of the Korean association of regional geographers,* 14(6): 643-663.

Fontela, E., & Gabus, A. (1976). The DEMATEL observer. DEMATEL 1976 report. Geneva, Switzerland: Battelle Geneva Research Center.

Gabus, A., & Fontela, E. (1973). Perceptions of the world problematique: Communication procedure, communicating with those bearing collective responsibility. DEMATEL Report No.1. Geneva, Switzerland: Battelle Geneva Research Centre.

Hu SK, Chuang YC, Yeh YF, Tzeng GH. (2012). Combining hybrid MADM with fuzzy integral for exploring the smart phone improvement in M-Generation. *International Journal of Fuzzy Systems,* 14(2): 204-214.

Jerry Ho W-R, Tsai C-L, Tzeng G-H, Fang S-K. (2011). Combined DEMATEL technique with a novel MCDM model for exploring portfolio selection based on CAPM. *Expert Systems with Applications,* 38(1): 16-25.

Jung, Musung. (2006). The Case-study of Community-welfare planning in Metropolitan City. *Annual Conference of the Korean Academy of Social Welfare,* 67-93.

Ju, Sanghyeon. (2010). A Comparative Study on the Community Welfare Plans in Local Government. *Korea Association for Public Administration Annual Conference 2010,* 1-20.

Kim, Heungjoo. (2005). A Critical Appraisal of Community-Based Welfare System. *Journal of the Korean Rural Sociological Association,* 15(1): 257-288.

Lee-Inhoi. (2006). A Study on the Value Orientation of Community Welfare Policy. *Korean Public Administration Review,* 20(1): 229-249.

Ming-Lang Tseng & Yuan Hsu Lin. (2009). Application of Fuzzy DEMATEL to develop a cause and effect model of municipal solid waste management in Metro Manila. *Environmental Monitoring and Assessment,* 158: 519-533.

Miyawaki, Atsushi. (2003). *Theory of Public Management.* Tokyo: PHP Research Institute, 105-144.

Oh-Jeongkeun. (2008). A Study on The Process of Community Welfare planning: Focused on The Chonnam Local Government's Community Welfare Plan. *Annual Conference of the Korean Academy of Social Welfare,* 309-316.

Park Sunghyun·Osamu, Soda·Choi, Seungyoung. (2011). A Structured Analysis of Urban decay problems by DEMATEL: Focused on Nisikawaguchi area of Saitama Prefecture, Japan. *Korea Real Estate Academy Review,* 46:

321-337.

Park, Taeyoung. (2003). A Study on Community Welfare Support Planning in Japan. *Journal of Social Welfare Development*, 9(2): 117-146.

Sanders, Irwin. (2003). *The Community: An Introduction to a Social System*, New York: Ronald Press.

Shieh J-I, Wu H-H, Huang K-K. (2010). A DEMATEL method in identifying key success factors of hospital service quality. *Knowledge-Based Systems*, 23(3):277-282.

Toshiyuki, Monma. (1992). The Evaluation of Farm Road Development by the Applocation of DEMATEL Method. *Journal of Rural Planning Association*, 11(3): 7-20.

Tseng M-L. (2009). A causal and effect decision making model of service quality expectation using grey-fuzzy DEMATEL approach. *Expert Systems with Application*, 36(4): 7738-7748.

Yang WT, Liu WH, Liu HH. (2013). Lanasari Evaluating influential factors in event quality using DEMATEL method. *International Journal of Trade, Economics and Finance*, 4(3): 92-97.

Busanjin-ku Homepage(http://www.busanjin.go.kr)