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Can the Veil of Ignorance Create Consensus?

A Qualitative Analysis Using the Siting for a Contaminated Waste Landfill Game

Miki Yokoyama[1(✉)], Susumu Ohnuma[1], and Yukio Hirose[2]

[1] Hokkaido University, N10 W7, Kita-ku, Sapporo 0600810, Japan
myokoyama@lynx.let.hokudai.ac.jp
[2] Kansai University, Takatsuki, Osaka, Japan

Abstract. This study aims to demonstrate the significance of the discussion under the "veil of ignorance" in building consensus about the Not In My Back Yard (NIMBY) issue. The Siting for a Contaminated Waste Landfill Game simulating conflicts related to the site selection of a contaminated waste landfill created by the accident at Fukushima nuclear power plant was developed with the veil of ignorance implemented as the prevailing social structure. The game involves two types of players: mayors, who are aware of the interests of their regions but can only engage in discussion; and citizens, who are unaware of the specific concerns of their regions (i.e., under the veil of ignorance) but are tasked with engaging in discussions and making the final decision. The transformations in the ideas of the players were examined through this game relating to building consensus. Ten games were conducted, and no unfair decisions were discerned under the veil of ignorance. A qualitative analysis of the open-ended questions revealed that a) the participants focused on fair viewpoints and avoided obsessions with regional interests after the discussion, and b) the diversity of actors and the multiple value dimensions were consistently emphasized before and after the discussion. Hence, this study succeeded in demonstrating that by participating in discussions under the veil of ignorance, the participants were able to form a shared recognition of the multiple-decision process, which the involvement of a diversity of actors and values was crucial for the formation of a consensus on the NIMBY issue.

Keywords: Veil of ignorance · NIMBY issue · Consensus building · Contaminated waste caused by fukushima nuclear power plant

1 Introduction

This study explores ways in which consensus in NIMBY (Not In My Back Yard) conflicts may be promoted using the Siting for a Contaminated Waste Landfill Game. NIMBY describes the phenomenon that even people who recognize the general social need for a facility do not want it to be constructed near their homes. NIMBY connotes that people living in a wider area, particularly in large cities, benefit from a facility while the inhabitants who reside in proximity to the facility assume its risks and burdens. In other words, NIMBY issues are dominated by the inequitable distribution

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of biased risks. Hence, consensus building becomes difficult when people are confronted with such a problem. This study addresses the issue of designated waste caused by the incident at the Fukushima nuclear power plant as a typical NIMBY problem. Contaminated waste has been collected but it has not yet been disposed of. Even today, designated waste has been left in residential areas, farmlands, and on the roadside in some areas. The site for a facility for the long-term management of the designated waste must be determined to handle this waste safely and to avoid the risks associated with radioactive materials. Hirose (2015) developed the Siting for a Contaminated Waste Landfill Game simulating this situation. The game centers on the site selection of a contaminated waste landfill and employs the concept of the veil of ignorance, which will be explained in the following section [1]. Yokoyama et al. (2017) exhibited the effectiveness of the veil of ignorance in fair decision making using this game [2]. However, it is not yet clear whether subjective recognition of the situation was modified and whether the participants' contexts were altered by the discussions under the veil of ignorance. Therefore, this study examines the changes observed in the subjective representation of participants before and after discussions held under the veil of ignorance. In the process, it focuses on participants' perceptions of whether stakeholders can reach a consensus on their own, and whether they recognize the necessity of the involvement of citizens. The qualitative analysis conducted by this study underscores the effectiveness of discussions under the veil of ignorance. The manner in which the relevant actors should be engaged in the process of building consensus for NIMBY issues is also explored.

2 The Siting for a Contaminated Waste Landfill Game Incorporating the Veil of Ignorance

2.1 NIMBY Issues and the Possibility of Building Consensus Through the Veil of Ignorance

The disposal of designated waste is a typical NIMBY issue. In such a case, an inequitable situation results when people across a large area benefit from a facility while inhabitants living near the site bear the distribution of the burden and risks associated with the facility [3]. Although the facility benefits the public as a whole, it is almost impossible for residents to agree on a location for the site because no one wants such a facility near their home. This impasse results in the failure to achieve the public benefit. In such a situation, the verdict may be deferred to a disinterested third party. In reality, however, local inhabitants regard such verdict as forced and refuse to accept them. They may also sometimes become incentivized to incite strong opposition movements. Alternatively, consensus becomes impossible if only stakeholders with particular interests discuss the issue because no one wants to take on the risks. Hence, arguments based on conflicting interests arise. Thus, public engagement involving stakeholder dialogs and the participation of citizens is essential to consensus building under uncertainty, framing the goal of comprehending the broad values desirable for the public [4, 5]. The scope for obtaining public engagement is accorded by simulation and gaming content [6]. For example, Ohnuma and Kitakaji (2015) developed a game

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that simulated the conflicts concerning the site selection for wind power plants as a NIMBY concern. Through this game, the process of consensus and negotiate discrete values through stakeholder dialogs can be observed [7]. However, the difficulty in NIMBY issues vests in the building of an agreement on the site for a facility for designated wastes because no inhabitant has discharged such unwanted matter. Furthermore, such designated waste causes much fear and stigma similar to the other nuclear issues. Accordingly, discussions for choosing a site reach a deadlock as long as the victims are determined beforehand.

To overcome such stalemates, it was proposed that a consent about the decision-making process should be obtained in advance in a context within which everyone can potentially be a concerned party, without actually ascertaining their own particular interests. In this uncertain situation, everyone will be required to consent to a method of decision making that focuses on the interests of society as a whole, rather than on their own advantages. Such a decision-making process would be regarded as fair and would lead to public acceptance. This idea is derived from Rawls' notion of the veil of ignorance [8].

According to Rawls, people act by default on the basis of their own interests, ranks, and contexts. However, if they are placed in a situation where they do not know their present or future position, they assume the worst case and choose the best option for such circumstances (the maximin principle). Also, if people are unaware about the specific concerns of the parties, they are likely to evaluate not only their own self-interest but also various publicly desirable values. Rawls' definition of the veil of ignorance, the maximin principle, and the evaluation of values is considered vital for the fair distribution of resources. This study extends this principle to procedural fairness. A situation in which the concerned parties operate behind the veil of ignorance is created: they must make their assessments based on general considerations without specifically knowing how their choices would influence each party. In other words, they work in a context in which everyone becomes involved as a potential concerned party but remains ignorant about their own advantages and the gains of others. It is presumed that in such situations people will avoid resulting in undecided, which is undesirable for the whole public. In addition, it is assumed that people are concerned about the location of the site and will avoid irresponsible speech and behavior.

If this is so, then who should wear the veil of ignorance and join the discussions pertaining to NIMBY issues? Who should be involved in the decision-making process, in what role, and how are points to consider for consensus building in such matters? It should be noted that the roles of participants vary depending on the stage of the decision-making process, particularly with regard to the major stakeholders and citizens. For example, when narrowing down candidate sites to form a consensus, Renn and his colleagues [9] proposed "cooperative discourse", with a three-stage decision-making process involving stakeholders of the multiple location candidates, experts who would evaluate the locations, and citizen representatives from the entire region. The three-stage decision process functions in a specific manner at each step: the first step accords stakeholders the role of discussing and extending relevant claims; experts play a role in proposing how to evaluate the claims in the second step; and citizens evaluate the claims in the third step.

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However, Renn et al. (1993) reported the failure of the application of the three-stage decision-making process [10]. In one case, an interview was first held on the issues concerning the interested parties; next, a citizen's meeting was conducted; and finally, the candidate site was decided. However, the residents surrounding the chosen area rejected the selection. The concerned parties were not clearly defined before the process of the selection of the candidate site. Rather, the concerned parties responsible for locating the facility were revealed as the process advanced. This lesson suggests the need for the postulation of a decision-making process in which everyone potentially involved as a concerned party agrees in advance to vest the evaluation to citizens who do not know their own or others' interests and who do not know where to locate the facility: thus, participants agree to being placed behind the veil of ignorance. Those under the veil of ignorance are expected to arrive at their judgment from the perspective of public benefit.

Also, the stakeholders may not have understood the roles of each participant in each process in advance. Further, the roles participants were expected to play could have been insufficiently defined. These factors could be cited as other reasons for the failure of the abovementioned previous study. Thus, the stepwise decision-making process that incorporated different roles of the participants at each stage was effective but not perfect. The final decisions stemming from a process cannot be accepted if the decision-making method is not fully accepted beforehand.

This research endeavor thus proposes a decision-making method to address the weaknesses of previous studies: first, only stakeholders who understand their own benefits participate in the discussions and experience the difficulty of consensus building; next, participants under the veil of ignorance have a discussion and make a decision. This study employed a game simulating this decision-making process for a NIMBY issue and examined whether decision making incorporating the veil of ignorance is effective, and whether participants regard this decision-making process as fair and accept the final decision, even if it is personally disadvantageous for them.

2.2 A Previous Study Using the Siting for a Contaminated Waste Landfill Game

Numerous games have been devised to better understand conflict resolution [6, 7, 11]. The Siting for a Contaminated Waste Landfill Game simulates a situation concerning designated waste from the Fukushima nuclear power plant accident. The game requires players to choose the location of a facility for the long-term management of the designated waste. The game adopts the veil of ignorance as its given social structure; hence, every player can become a potential concerned party (i.e., every region can potentially be a candidate site). The players are classified into two types: the delegates of a region (mayors) who understand the specific interests (i.e., the stakeholders), and citizens who are unaware of their own benefits and concerns and of the benefits and concerns of their regions, thus who operate behind the veil of ignorance. The game encompasses two decision stages. In the first stage, the mayors convene a discussion and ex press their claims with regard to the criteria for the site selection. In the second stage, citizens evaluate these claims and evaluate the criteria. The candidate site is determined in accordance with the values appraised by the citizens. All players are then

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asked whether the decision is acceptable to them. However, unfair decisions even by citizens unaware of their interests were observed (e.g., pushing against some city) in some games of the previous study, and the mayors did not accept the decisions. These outcomes implied that the veil of ignorance did not work [2]. Therefore, the rules were modified. A practice phase was conducted before the two-stage decision process. In this phase all the players were stakeholders who were aware of their own interests. Naturally, no consensus occurred. After this failure, the researchers introduced the two-stage decision making as the actual phase. In this round, the participants who took on the role of citizens did not make unfair decisions; instead, they concentrated on the relative importance of the criteria for the site, and even mayors of the regions that were ultimately selected as candidate sites accepted the verdict of the citizen's group. The questionnaire survey administered after the game confirmed that many participants considered the discussion by citizens under the veil of ignorance to be just and accepted the decisions resulting from the exchange of ideas. Further, many participants understood the necessity of public participation in the final decision. However, the transformative process of the participants' subjective recognition before and after the consensus building discussions held for the NIMBY issue under the veil of ignorance remains uncertain. Thus, the present study focuses on the changes that were observed in the perceptions of the participants.

2.3 The Purpose of This Study

This study aims to investigate the modifications in the subjective perceptions of participants in consensus building discussions conducted on a NIMBY issue under the veil of ignorance. The manner in which participants perceived stakeholder discussions and decisions under the veil of ignorance and how they changed their attitudes in the consensus building process during the two phases of meetings were examined. A questionnaire survey was administered after each phase to ascertain the subjective perceptions of the players. The obtained responses were classified and were subsequently mapped as representations of the opinions of participants. The participant perceptions before and after the administration of each questionnaire were compared. Finally, the changes in the participant representations were described from the perspective of the fairness of the decision-making, the recognition of the need for the participation of citizens placed under the veil of ignorance.

3 Method

3.1 An Overview of the Siting for a Contaminated Waste Landfill Game

Each player lives one of six cities in X prefecture: A-, B-, C-, D-, E-, or F-city. While designated wastes have been temporarily stored in various areas of X prefecture, selecting the location for a long-term management facility will bring the safer handling of the waste and will mitigate the risks associated with radioactive material. Scores are set for regional features to provide cues for decision making about where to locate the candidate site. The scores reflect criteria provided by scientific knowledge, and higher

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scores indicate diminished aptness of a location. However, since each city has specific regional features, a candidate site must be selected by weighing the significance of these characteristics.

This game encompasses a practice phase and an actual phase. In the practice phase, all players participate in the role of stake-holding mayors representing their particular regional concerns. It is assumed that this phase allows participants to experience the difficulties of arriving at an agreement of only stakeholders are engaged in discussions. The actual phase is executed a week after the practice phase, and at this juncture, the players are randomly assigned roles as mayors or citizens. The mayors act in their own regional interests and argue that their distinct regional features make their regions unsuitable as sites. The citizens listen to the contentions made by the mayors but do not hear the arguments offered by the mayors of their own cities. Afterward, each citizen can ask one question to the mayors. After the questions and answers are accomplished, all the citizens discuss and determine the ranking of regional features, unaware of the specific concerns of their own cities. The region assigned the lowest score by the citizens becomes the candidate site.

3.2 Regional Features and Method of Calculation

The six regional features used in the game were among those that mattered in reality. They were thus familiar and easy for the participants to apprehend. Each regional feature was accorded a reference point between 1 and 5 to reflect the feasibility of locating a long-term designated waste management facility in its presence. These reference points were assigned using criteria from the actual screening method proposed by the government. The reference points were simplified, and their evaluation methods differed according to the particular features. The scores assigned in this game for the regional features are evenly distributed among the cities (Table 1). It must be noted that different regional features and matrices of reference scores were used in the practice and actual phases.

Table 1. An example of a matrix of regional features.

Regional features unsuitable for site selection	A city	B city	C city	D city	E city	F city
Active fault	5	1	3	3	1	5
Groundwater vein	1	3	5	1	5	3
Debris flow	3	5	1	5	3	1
Hospital	4	1	2	2	1	4
Rare plants and animals	2	4	1	4	2	1
Farm land	1	2	4	1	4	2

The higher score signifies greater unsuitability of the location

The players ranked the regional features in order of importance for the location with higher rankings reflecting lesser suitability of the site. Table 2 shows the weighting

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given to the rankings in the actual phase. The city with the lowest score calculated through the weighting of the reference points for each city became the candidate site.

Table 2. Rank and weighting

Rank	Weighting
1	×6
2	×5
3	×4
4	×3
5	×2
6	×1

3.3 The Flow of the Game

All players functioned as mayors in the practice phase. First, the players knew the regional features of their communities and scored them by selecting a card. Prior to the mayors' meeting a time was arranged for the consideration of why features assigned high numerical scores would make a location unsuitable for the facility. For 20 min in the first half of the meeting, the participants discussed the methodology of selecting the candidate site. In the latter half, they debated the issues for 10 min and selected a candidate site in accordance with the procedures outlined earlier.

The actual phase was executed one week after the practice phase. The participants were randomly assigned roles as mayors or citizens. They were instructed that a high numerical score for a feature given on a card indicated that the attribute made the location unsuitable for the facility and that they should consider the reasons why particular characteristics would exclude a candidate site. The mayors then were divided into two unit and group discussions were held. The mayors argued in each group dialog outlined their reasons why certain regional features rendered a site unsuitable for the facility. Meanwhile, the players designated citizens simply listened to the contentions. Each citizen representing a city could ask one question to a single mayor only after the mayor had presented arguments. At this stage, the cities were divided into two groups to prevent the citizens from knowing the features of their own cities. For example, when the mayors of group X (A-, B-, and C-city) conducted their group discussion, the citizens belonging to the group X cities could not listen to them. Instead, they listened to the mayors of the group Y (D-, E-, and F-cities). Figure 1 illustrates this format.

After the mayors' argumentations were accomplished, the full group of citizens discussed and ranked the six regional features. The facilitators computed the final decision after the citizens' meeting, using the ranking and weighting assigned by the citizens. The candidate site was then selected through this calculation, and the outcomes were reported to the mayors and citizens. Finally, a debriefing session was held.

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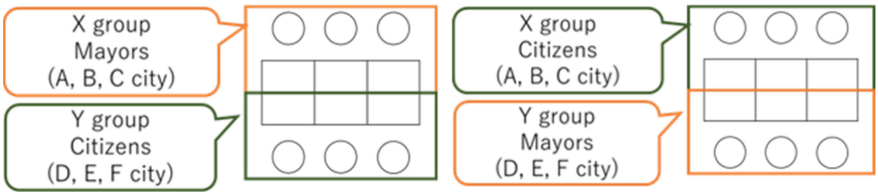

Fig. 1. The format of the mayors' meeting in the actual phase

3.4 The Implementation of the Game

Ten games were conducted with university students in November 2017 and July 2018. A total of 134 students participated, with 12–14 individuals engaged in each game. The actual phase was conducted one week after the practice phase for all ten games.

3.5 Questionnaire After Each Phase

Participants completed two questionnaires: one after the practice phase, and the other after the actual phase. The following inquiries were made in each questionnaire: "Do you think a decision could be reached only through a discussion by the mayors? Why do you think so? Do you think impartial third parties are required?" and "Do you think the participation of citizens is necessary for the final decision making about the site of the facility? Why do you think so?" As may be noted, two of the questions were open-ended.

4 Results

4.1 General Results

17 out of 20 groups reached a consensus in the practice phase with regard to the city selected for the site. This result was at variance from the previous study in which stakeholders failed to reach an agreement [2]. Two patterns were observed in the three groups that did not reach a consensus: two groups nearly achieved agreement but failed due to the lack of time; and the third group could not attain an accord because every member expressed different claims and the players could not compromise, propose alternative ideas, or make constructive suggestions.

Consensus was accomplished in all ten games at the citizen's meeting in the actual phase, and no remarks were made against the other cities.

4.2 Change in Subjective Perceptions After the Practice and Actual Phases

The two open-ended questions to compare the participant perceptions just after the practice and actual phases were qualitatively analyzed.

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Evaluation of the Manner in Which the Discussions Were Conducted and an Appraisal of the Decision-Making Authority. First, the participants' thoughts about whether only mayoral discussions could suffice and result in a decision and whether impartial third parties were required were examined. Responses were classified using the KJ method [12, 13], a qualitative analysis technique that maps similar categories closer to each other and discrete categories further apart. Figure 2 depicts the distribution of opinions in the practice phase, and Fig. 3 portrays the outcomes of the qualitative analysis accomplished for the actual phase. The responses were categorized from (A) to (M), as shown in Figs. 2 and 3 The horizontal axis represents the opinions on the question asking whether or not the mayors could reach a consensus on their own. The right side of the horizontal axis signifies the belief that the mayors cannot reach consensus on their own, while the left side of the horizontal axis symbolizes the conviction that the mayors can reach a consensus on their own. The vertical axis embodies the involvement of other actors. The upper part of the axis corresponds to the belief that third parties, citizens, and experts should be involved. Notably, the origin point, where the vertical axis and the horizontal axis intersect, is moved to the left, evincing that only a few participants believed that mayors could achieve agreement on their own, and the majority did not agree with this idea.

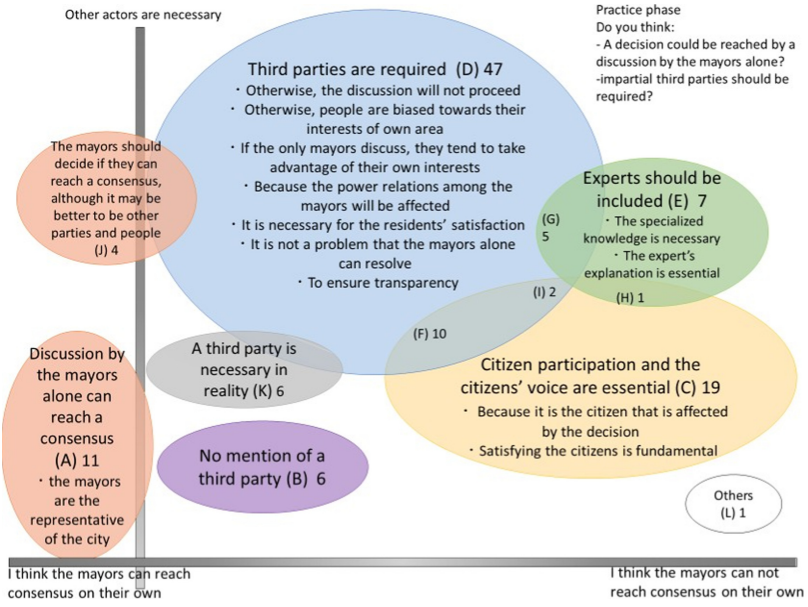

Fig. 2. The mapping of responses to questions about who can make the decision (practice phase)

Eleven statements in the practice phase (Fig. 2) described that mayors could reach consensus on their own. These were mapped at the bottom left of the illustration. However, this number was reduced to 3 in the actual phase (Fig. 3). In contrast,

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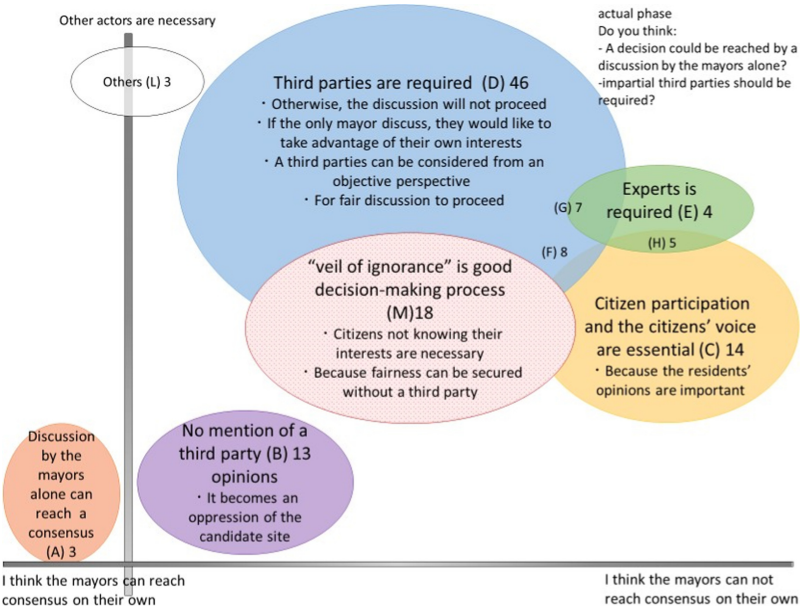

Fig. 3. The mapping of responses to questions about who can make the decision (actual phase)

numerous statements asserted the necessity of third parties both in the practice phase and in the actual phases. These are mapped on the upper left portion of the graph. Opinions expressing the need for citizens' voices, such as "residents' opinions were important", are mapped on the right. Participants' opinions regarding the necessity of experts versus citizens' voices, e.g., "experts should be included" were also mapped. This plotting demonstrated that participants recognized the importance of involving multiple actors in the decision-making process, not just advocates of particular interests. In addition, 18 views about citizens wearing the veil of ignorance, such as "citizens not knowing their interests are necessary" are positioned in the center of the map.

Evaluation of the Necessity of the Participation of Citizens in the Final Decision. Responses to the inquiry regarding the necessity of the participation of citizens in the final decision making were then analyzed. Figure 4 shows the mapping of the opinions from the practice phase, and Fig. 5 illustrates the outcomes from the actual phase. The KJ method was utilized again for the classification of the responses, which were categorized from (A) to (T) as illustrated in Figs. 4 and 5 The horizontal axis represents belief in the necessity of citizen participation, and the vertical axis represents the conviction that better decisions may be achieved for society as a whole by the inclusion of varied actors. The left part of the horizontal axis signifies the opinion that the participation of citizens is necessary, while the right denotes the estimation that the involvement of citizens is unnecessary. The top of the vertical axis epitomizes the notion that better decisions result from the contemplation of diverse opinions and values by involving many actors through public participation.

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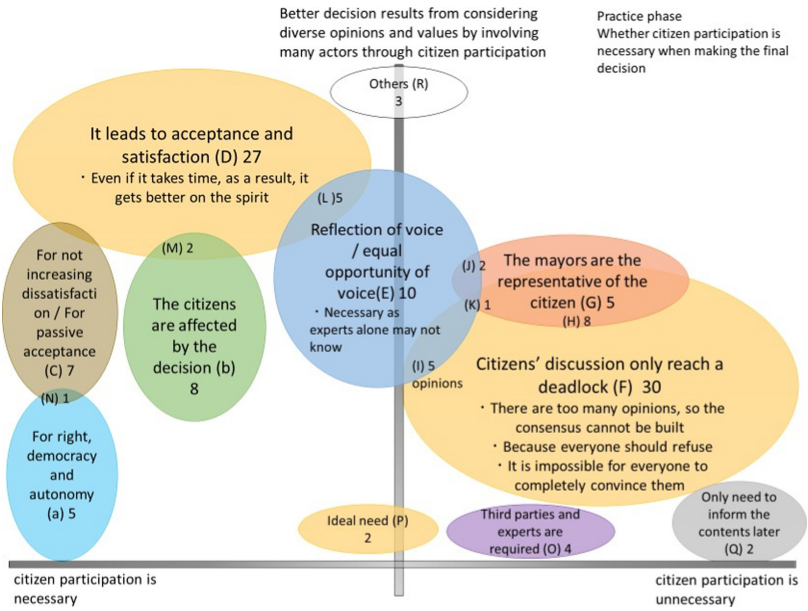

Fig. 4. The mapping of the responses to questions about the necessity for public participation (practice phase)

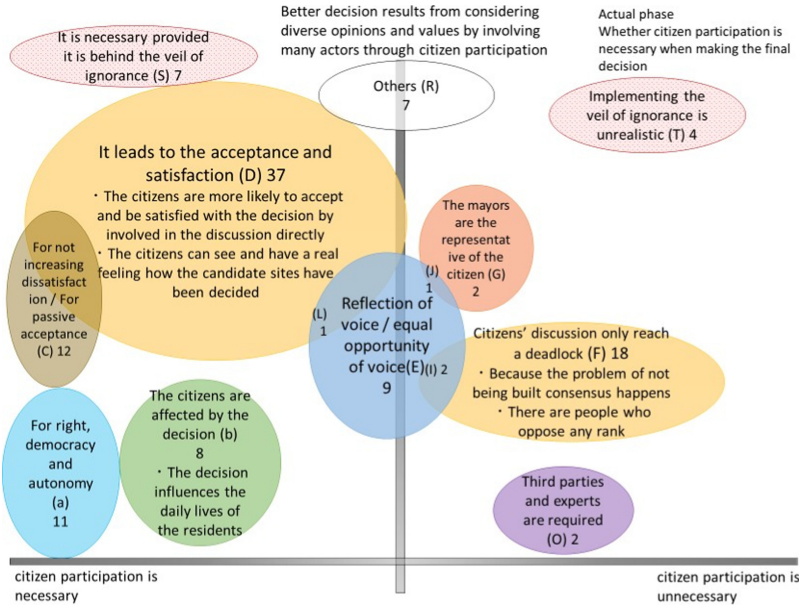

Fig. 5. The mapping of the responses to questions about the necessity for public participation (actual phase)

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In the practice phase, some opinions asserted the redundancy of public engagement because it was believed that citizens' discussions were likely to deadlock. In the actual phase, however, these views decreased, and the articulation of faith about the necessity of public participation increased, along with the conviction that the engagement of citizens would lead to acceptance and satisfaction. Notably, opinions about the veil of ignorance emerged after the actual phase was conducted. Many such assertions claimed that public participation was necessary provided citizens were placed behind the veil of ignorance. However, a few statements also asserted that the participation of citizens was unnecessary because the application of the veil of ignorance was not practicable. However, even those who thought the veil of ignorance was unrealistic admitted its necessity and effectiveness. The challenge, thus, pertains to the identification of ways to implement it into the actual decision-making process.

5 Discussion

This study investigated changes in the ideas of the participants with regard to the involvement of varied actors and roles in the process of consensus building for a NIMBY issue. In its endeavor, the present investigation utilized a game on the site selection for a contaminated waste landfill to demonstrate the effects of discussions held under the veil of ignorance. The results indicate that participants were likely to strive for a fair perspective after the actual phase, avoiding obsession with regional interests and respecting the views of other residents. Further, participants recognized the involvement of various actors after both the practice and actual phases and acknowledged the value of contemplating diverse opinions and values.

Three out of 20 groups were unable to reach consensus in the practice phase. However, all 20 groups achieved agreement in the actual phase in which participants worked under the veil of ignorance. The qualitative analysis of the participant responses on the administered questionnaires revealed that they recognized the effectiveness of public decision-making under the veil of ignorance after experiencing the success of consensus building under the veil of ignorance in the actual phase. However, this outcome does not negate the decision-making rights of stakeholders with strong regional interests. A stakeholder meeting should certainly be held; however, the results of that discussion should not denote the final decision. Rather, the stakeholder meeting should precede a final decision taken by citizens who remain behind the veil of ignorance. Actually, the game accorded participants an awareness of the superiority of the two-step decision-making process in promoting acceptable decisions. These results suggest that the decision-making process involving discussions by both interested parties and by citizens placed under the veil of ignorance are not in opposition but are, rather, mutually compatible. Moreover, despite the fact that the findings were obtained from a simulated environment, they provide empirical evidence that a stepwise decision-making process can be applied to actual conflicts.

It is difficult for people to recognize their roles, positions, and interests in the real world, which makes it more difficult to build consensus. However, participants are aware of playing a role in gaming; the simulated environment of gaming can thus strip away the unacknowledged roles from our actual lives. The veil of ignorance may be

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applied by making those playing the role of citizens unaware of their own specific interests and positions but aware of being involved as concerned parties. Participants can liberate themselves from preconceptions and make fair judgments when they enact their roles free of particular positions and interests.

However, this study admits to certain limitations. Participants could reach a consensus because they did not completely assume the mayoral role. Indeed, some participants noted that it would be more difficult to achieve agreement in the mayoral discussions if real decision making was involved. The introduction to the role of the mayors should be modified in a manner that the players enacting the role feel they are burdened with regional interests as representatives. In addition, participants may not experience the gravity of the disadvantages and risks associated with their residential areas becoming the site for the facility. Conversely, participants may have been able to reach consensus because the necessity for the facility was so heavily emphasized. The rules and instructions, as well as the matrix of the game, must be refined so that participants can feel a strong and specific "sense of loss" in conjunction with stigma if they are to accept their region becoming the site for the disposal of designated waste contaminated by radioactive substances.

Despite these limitations, this study was able to demonstrate that the experience of discussing an issue under the veil of ignorance made participants recognize public participation to be a better means of achieving a fair decision. A criticism may be made that it is unrealistic to conceive of a situation in which citizens are unaware of their own attributes. However, it is possible to conceptualize a condition in which any area can be a candidate site before the inspection begins and none of the people know whether their residential area is a candidate site unless the detailed inspection is performed. This scenario may be regarded as incorporating the veil of ignorance in reality. In that sense, the application of the veil of ignorance may be practicable in the real world, although the game must be further fine-tuned. In sum, a possible stepwise public decision-making process involving diverse actors behind the veil of ignorance has been addressed in this paper.

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