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Title of the paper

*An Analysis of the Political Process of the Radioactive Waste
Management in the UK: Focusing on the Public Deliberation*

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ABSTRACT

After an attempt by the United Kingdom to site a disposal facility for radioactive waste met with failure in 1997, they adapted a new siting process with Public Deliberation, in which they were again unsuccessful faced with the opposition of a candidate municipality. The validity of Public Deliberation, however, is indicated by some case-studies. In order to examine the effect of Public Deliberation in this case, causality analyses were conducted. As a result, influential factors in the political process have been identified, such as the lack of participation in the deliberation activities of the main decision makers, and the incoherence of the policies concerning the project from a moral viewpoint.

Key Words: *Radioactive waste management, public deliberation, public acceptance, political process, The United Kingdom*

1. Background and the objectives of the research

Siting a disposal facility of radioactive waste is, both socially and politically, a difficult issue that various countries have today. Radioactive waste must be managed in some way, but in reality, sufficient discussion about management policy has not been done in many cases. It is often observed that residents strongly oppose to deal with radioactive waste in their region.

This is especially because a head of the local authority started to consider the possibility of accepting the facility without consensus of the parliament¹⁾, or because hard-hitting arguments were used by those who are opposed to acceptance²⁾, and thus the residents start to get anxious about it.

It is expected that the Public Deliberation, which was actually utilized in the case of Sweden, plays an effective role in discussing the management policy. The aim of this engagement is to enrich an awareness and a comprehension of the issue, throughout longtime dialogs of the executive body with residents of the candidate municipality and stakeholders. In the United Kingdom, as a resistance movement to the siting of a disposal facility at Sellafield in Cumbria County occurred in 1997, a new siting process employing the public deliberation is adopted, and the Committee on Radioactive Waste Management (CoRWM) is established. After their work, in 2007, because some councils including the Cumbria County Council expressed interests to participate in the siting process, West Cumbria Management Radioactive Waste Management (MRWS) Partnership was formed and their dialogs were open to everyone. However, the Cumbria County Council voted against continuing the process in 2013, which halted the project again.

The utility of public deliberation is suggested by Lidskog et al. (2004)³⁾, who analyzed the

case of Sweden, and Komatsuzaki (2013)⁴⁾, who analyzed radioactive waste management project in France, South Korea and Japan. Yet, in the UK's case, it does not seem to be effective.

Were there problems that prevented the public deliberation from performing in the case of the UK? Or, the halt of the UK's radioactive waste management was led by some reason that disturbed the effectiveness of the public deliberation?

In this context, the objectives of this paper are to seize the whole image of the case in the UK, clarifying the political process, to qualitatively estimate the reason for the failure by analyzing the causality between the events and the acts of people in the political process, and at last, to obtain suggestion concerning the effectiveness of the public deliberation.

2. Previous studies and the methodology of the research

The history of the UK's radioactive waste management is explained as “a search for legitimacy” which is “derived from a process of justificatory discourse” in which citizens participated (Mackerron *et al.*, 2009⁵⁾). A key point in the process is the activity of CoRWM that provided a lesson to the other similar committees which are “charged with recommending to government on the management of technically complex and risky technologies,” namely that extensive public and stakeholder consultation play an important role (Morton, 2009⁶⁾). Even

though Blowers (2016)⁷⁾ discussed the case including the halt in 2013, consideration is not sufficient from the point of view of whether or not the public deliberation of the UK was appropriate as a measure to contribute to the progress in the management process. This study, thus, aims at analyzing the reasons why the process halted and at obtaining a suggestion concerning the efficiency of the public deliberation.

Generally speaking, methodologies of research that treats public acceptance can be classified into two categories. Those in the first category use a statistical approach, sometimes using polls, in order to explore the attitude and the incentives of the citizens (Osawa *et al.*, 2016⁸⁾; Kunreuther *et al.*, 1990⁹⁾). Those in the second category utilize a descriptive approach in order to clarify how the project is carried out and understood, focusing on the acts of stakeholders in policy implementation (Honda, 2005¹⁰⁾; Saigo *et al.*, 2009²⁾; Yamaguchi *et al.*, 2010¹⁾). Since this study discusses the management of radioactive waste management whose number of cases is limited, the latter one, a descriptive and interpretative approach is adopted, in order to consider particularities of the case such as cultural backgrounds. The study starts with the description in detail of the political process of this case, utilizing the information obtained from literature survey on articles, reports, newspapers and the interviews that the authors conducted. These interviews are conducted for 1 to 2 hours up to 13 times, with a total

of 15 persons (the chair of CoRWM, its members, a co-founder of an environmental NGO, etc.), in July, November and December 2015. The subject of the description is from the 1980s when the management of radioactive waste started, to 2013 when the management process halted when confronted with the withdrawal vote of the Cumbria County Council.

Based on this description, causality analyses in the case on 1997 and 2013 were conducted in order to examine whether the management project proceeded with public deliberation. The analyses were prepared at first by classifications of the discourse obtained from the literature survey. For each piece of information classified in terms of its importance, the causality is described both in words and figures. After extracting factors influential to the results of the project, the political process is reinterpreted.

3. Description of the political process

3.1. Failure of the siting on 1997 and establishment of CoRWM

Cumbria County is a municipality in the North-West of England, which possesses several nuclear facilities called Sellafield. The history of the nuclear industry in the county started with military use in the pre-war days, and the land already had in storage approximately 60% of the total amount of radioactive waste in the whole UK at the time in the 1980s. As a body in charge

of siting a disposal facility of low level and intermediate level radioactive waste, the Nuclear Industry Radioactive Waste Executive (Nirex) was founded in 1982, which incorporated in 1985, and it performed the selection from the late 1980's to the early 1990's, though Sellafield was recognized as the most plausible candidate by the Government¹¹⁾. Nirex adopted a screening in the early stage of the siting process, which narrows down more than 500 candidate sites in such an exclusive way that the criteria of selection and the list of candidate sites were not disclosed. Moreover, even though some experts indicated several times the complexity of the geological situation around Sellafield¹²⁾, Nirex designated it as a unique candidate, which made Nirex and the Government untrustworthy to people. In response to this, Nirex revealed and presented to the Cumbria County Council a construction plan for a Rock Characterization Facility (RCF) that precedes a disposal facility on 1992¹³⁾, but the council rejected this proposal in 1994. A public inquiry was held in 1995/1996 after a recourse by Nirex which objected to the rejection. Nirex saw numerous experts on the council's side who insisted that the geological situation around Sellafield was unsuitable for the construction of the disposal facility. The decision by the council opposing the proposal was finally respected and the RCF plan was formally rejected by the Minister of Environment at the time, John Gummer in 1997¹⁴⁾.

This decision led the Government, especially the House of Lords Science and Technology Committee, to contemplate improvements in the siting process¹⁵⁾. It was during this contemplation that they realized the importance of public acceptance. While the Government before 1997 regarded radioactive waste management as principally a technical problem, Tony Blair and his labour party which came into power in May 1997 launched policies one after another that focused on science communication with the aim of public acceptance¹⁶⁾. As one of them¹⁷⁾, to oversee the review process of radioactive waste management, Committee of Radioactive Waste Management (CoRWM), which is an independent organization to carry out the recommendations of desirable policy, was established.

Founded in 2003, CoRWM studied all kinds of radioactive waste management options without any pre-conception, after reflections on the case of 1997 in which the geological disposal had been the default route. Meanwhile, discussion meetings between the public and stakeholders, which is called Public Stakeholder Engagement (PSE), were held, and CoRWM developed the discussion involving the whole nation. Among the committee members, in addition to experts on nuclear issues, researchers in the social sciences, consultants as well as the founder of an environmental organization were on the list. After the activity over about

three years, CoRWM announced the final activity report on July 31, 2006, and recommended 15 items as policy orientations hereafter to the Government¹⁸⁾.

These recommendations included the following points: Geological disposal is considered at the moment to be the best available approach, a robust program of interim storage and technology development is essential in the long-term strategy, there should be continuing involvement of the public and stakeholders, any involvement of the community must be based on the principle of volunteerism for all of the proposals related to the site selection, community involvement should be achieved through the development of a partnership approach, and the potential host community has the right of withdrawal from the process.

It should be noted that Nirex was dismantled in 2005, and in the same year the UK Nuclear Decommissioning Authority (NDA) started its activities. This non-departmental public body, NDA, replaced Nirex, responsible for the management of radioactive waste (called the nuclear legacy) that has been accumulated so far¹⁹⁾.

3.2. West Cumbria MRWS partnership activities and the withdrawal vote of Cumbria County Council in 2013

Based on the final recommendations that CoRWM has been published, Department of

Energy and Climate Change (DECC) published a White Paper of 2008, and started a new siting process (Managing Radioactive Waste Safely; MRWS)²⁰⁾. In this process, the candidate municipalities voluntarily express their interest in participating in the process, and then a partnership between the municipality and the executive organization (NDA) will be established.

The participating municipalities exchange opinions with the residents and stakeholders throughout public meetings. After the discussions in the meetings and a preliminary investigation on the geological environment over a period of several years, the candidate municipality makes a decision on whether or not they proceed to the next step of the process.

In July 2008, the Copeland Borough Council in Cumbria County, where Sellafield is located, submitted their expression of interest to the consultation process with the government about the site selection of geological disposal facility to the Department of Environment, Food & Rural Affairs (DEFRA)²¹⁾. The 9th December of the same year saw the Cabinet decision of the Cumbria County Council express their interest. It was only the Cabinet members of the council who had been selected before that participated in the Cabinet meeting and had a vote. In addition, the Allerdale Borough Council, which is adjacent to the Copland Borough Council expressed its interest on January 30th of the following year.

Other than these three councils, the Government approved the participation of all organizations that wish to participate in the vicinity regions of Cumbria, and formed the West Cumbria MRWS partnership, adding agencies such as the second CoRWM (the successor agency of CoRWM that announced the final proposal in 2006) and NDA as observers²²⁾. It should be noted that an environmental NGO that had been asked to participate in this partnership refused the request. Reflecting the intention of the Cumbria County Council at the time of construction of the partnership, the Government promised that it is required to reach a total agreement of the three Councils for the transition to the next stage in the consultation process.

In the absence interest by other municipalities, the MRWS partnership became the sole framework of the consultation in this project. After 2010, the partnership carried out a preliminary stratum screening and public debates in various places in the municipalities. In the discussions, a few demands were raised such as the presentation of the content of economic benefits, and calls for the government to legislate a withdrawal right from the process. During this time, opposition movements by the residents in the municipality took place, as well as a controversy among geologists about the appropriateness of the geological condition of the Cumbria region for the construction of a disposal facility. In addition, the turning around of the

Government policy in 2008 to proceed with the construction of new nuclear power plants provoked criticism²⁰⁾, because it did not seem coherent for a certain number of people to move forwards an increase in the amount of waste while discussing the disposal of radioactive waste. In August 2012, the final report of the partnership was published, and the participants agreed that there is no reason to withdraw from the consultation process at this stage. This led the three Councils to make decisions about the transition to the fourth stage of the process (desktop research), but the Government postponed the resolution for approximately 3 months, recognizing the intention of the Cumbria County Council²³⁾.

On January 30th, 2013, the Copeland Borough Council voted for the transition resolution with 6 votes in favor and one against. The Allerdale Borough Council also agreed to proceed with the process with 5 votes for and 2 against, but the Cumbria County Council rejected it with 7 votes against and 3 votes in favor. Tim Knowles, a Councilor of the Cumbria County Council at the time, said “*there had seemed to be inconsistencies between what councilors said and how they voted.*”²⁴⁾ One reason for the vote was anxiety about the withdrawal rights which had not been legislated, another was concern about the impact on the tourism industry as well as concern about the geological environmental impact. Based on the partnership configuration at the time

of the arrangements, the withdrawal of the three municipalities from the process at this point was enacted²⁵⁾.

In 2012, the Shepway District Council in Kent County, where a nuclear power plant is located, was considering participation in MRWS process in the Council, but finally it decided not to in view of the local residents' opposition and the mitigated effect on job creation²⁶⁾.

4. Causality analyses of the political process

In order to consider whether or not the public discussions could contribute to development in the political process in this case, the cause-and-effect relationship is analysed that led to the halt of the siting process in 1997, followed by another causality analysis of the withdrawal resolution by the Cumbria County Council in 2013 and the halt of the MRWS process. These analyses were conducted on the basis of the information collected.

4.1. Causality analysis of the failure of siting proposal by Nirex in 1997

As for the plan rejected by the Cumbria County Council in 1997, the following two causality analyses were conducted, which are shown respectively in Fig.1 and Fig.2. These are based on the discourse obtained in the interviews and the statements in the description of the political

process in the previous chapter, in addition to the problems pointed out in the report by Nirex in later years. In the figures, the elements surrounded by squares represent objective events such as policies and facts, while those surrounded by a rounded corner rectangles represent the thoughts and feelings of residents and local Congress lawmakers. Those surrounded by a circle represent the thinking of those involved in the policy decision (implementing agencies, such as the central government, Nirex and NDA).

a. Closed site selection

In the UK in the 1990s, radioactive waste disposal was mainly recognised as a technical problem. Even at the site selection of a final disposal facility, only the few executives of Nirex had made the decision in the initial screening work, and the process had no room for reflecting the opinion of the candidate municipalities throughout the process. Also, it is pointed out in the report (Nirex 2005¹¹) that the Government had then imposed "political constraints" on Nirex. This could be interpreted as a direct order to select Sellafield, based on the geological distribution and the expectance of local acceptance of radioactive waste.

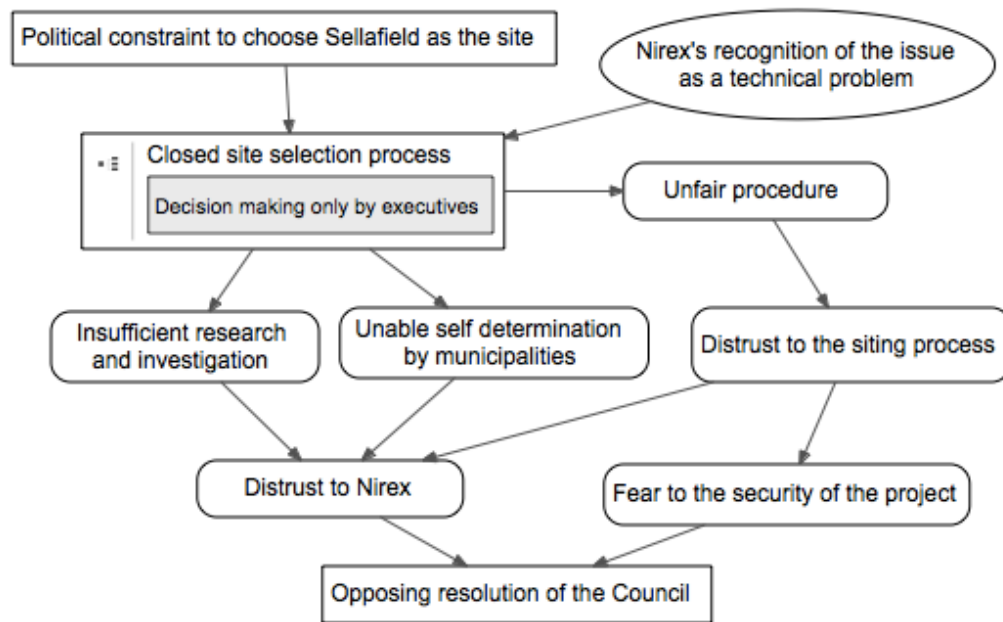


Fig.1 Causality diagram for Closed site selection

Against this background, the site selection process of Nirex was carried out behind closed doors, and thus it provoked criticism from people such as residents that that the procedure was unfair, which made the process untrustworthy for them. Also, the capacity of the Nirex to conduct sufficient surveys and research was in doubt because, in spite of the significant impact in their area, the process was detached from the opinion of people who live there. This aroused the mistrust of the Nirex. Above all, in addition to these concerns, the question of safety of the project has appeared. The inquiry with geological experts was thus held by the Cumbria County Council, whose conclusion was rejection of the RCF construction plan of Nirex. After the inquiry, Hazeldine et al. (1997) criticized in fact the description of Nirex in the inquiry for its

logical inconsistency¹²⁾.

b. Sellafield as a single candidate

The nuclear facilities of the Sellafield have offered such employment to the local area such as Copeland for many years that the acceptance of nuclear power by residents has been considered to be higher than in other regions. Also, the majority of radioactive waste in the UK is already stored there, so considerable expense is required to transport them to another place, entailing great risk. In view of the financial budget constraints, the government set Sellafield as the sole candidate.

However, despite the fact that the other candidate sites were excluded in the initial screening, it was pointed out that the geological condition around Sellafield was not appropriate for the final disposal of radioactive waste, by the experts from the side of environmental organizations and the Council in the inquiry. This led people to become anxious about whether the selection had been properly conducted. Besides, for the Nirex who came to Cumbria under the order of the Government, there were numerous residents and councillors who "*did not want to be persuaded by Londoners*²⁷⁾". Furthermore, some councillors of the Cumbria County Council felt it to be unfair that only Sellafield was forced to have the facility, while there is no other

candidate municipality. Coupled with distrust of Nirex, the Council decided to vote against the RCF plan.

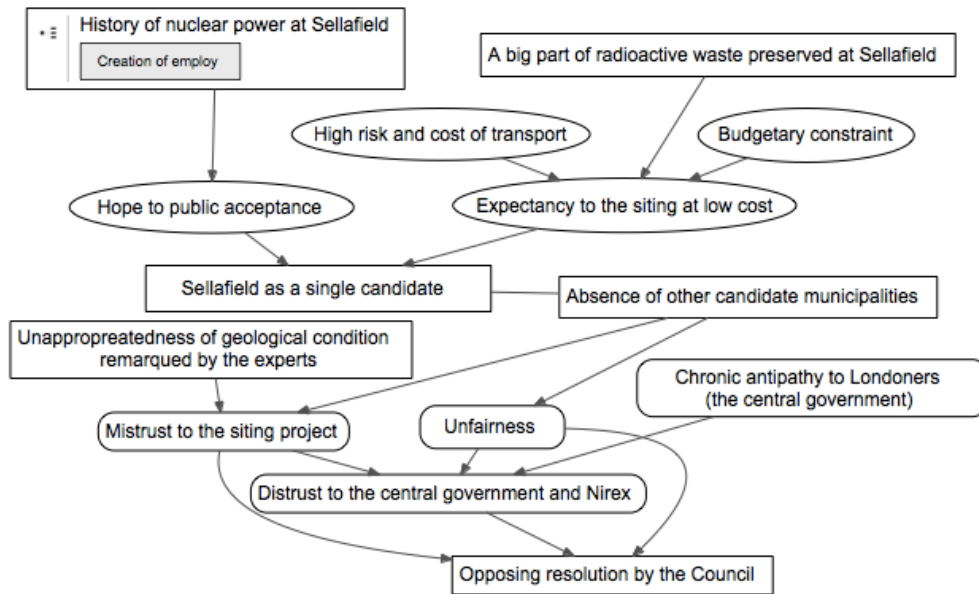


Fig.2 Causality diagram for Cumbria as a single candidate in 1997

4.2. Causality analysis leading to the halt of the MRWS process of 2013

With respect to the halt of the process by the withdrawal resolution of the Cumbria County Council in 2013, causality analyses were conducted from the following three perspectives as shown in the previous section, based on the collected information. The causality relationships are shown in Fig.3, Fig.4 and Fig.5.

a. Cumbria as a single candidate

In view of the history of Cumbria that has been co-existing with the nuclear industry, the residents of the county were expected to accept the siting of the facility, so the Government continued to consider this area as a candidate site. Since the other areas in the UK know all that a large amount of radioactive waste is stored in the area, they are not incentivised to have an interest to the process even if the siting process is based on voluntarism of each municipality. On the other hand, Cumbria County, where much radioactive waste is already stored, can be considered to have a willingness to actively participate in the discussion of the management because the final disposal facility is expected to create jobs. As a result, it came out that only the Cumbria County Council participated in the process as a candidate.

However, the fact that Cumbria is the only candidate evoked also distrust of the government at the same time. This is because, in the absence of other candidate sites, the future behaviour of the Government is questioned, such as whether the geological surveys were conducted in a fair way and whether the process will be stopped if it turns out that it is dangerous. This fear led the County Council to request the legislation of withdrawal rights to the Government, which wasn't finally realised. The candidate municipality, thus, decided to vote against the proceeding with the process because of anxiety about the lack of self-determination.

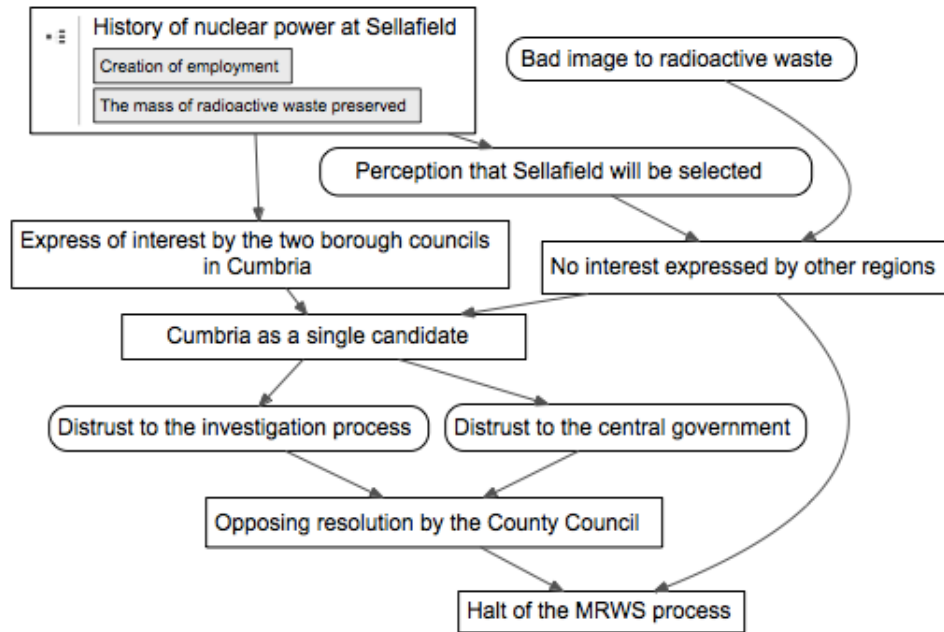


Fig.3 Causality diagram for Cumbria as a single candidate in 2013

b. The substantive authority of the County Council

The West Cumbria MRWS partnership was organized to respect the recommendations of CoRWM, and, based on the request of the Cumbria County Council, an agreement was signed which states that the candidate municipalities will proceed with the process only if all three of the councils, including the Copeland Borough Council and the Allerdale Borough Council, decide to continue the discussion. In fact, the recommendations of the CoRWM did not require forming a joint partnership, and it was possible to make independent partnerships with each municipality, as Belgium did¹⁹⁾. However, the request for a joint partnership by the Cumbria County Council was accepted because, presumably, the County Council had the power of

permission of the planning affairs and also there was a momentum that emphasized the social acceptance in response to the recommendations of CoRWM. Still, the County Council joined the partnership "*in view of the nuclear legacy¹ at the Sellafield site and the need to minimize the future movement of waste²⁸⁾*", which was different from the other two Borough Councils that have a positive view toward acceptance of the final disposal facility. There could have been an intention by the County Council to restrain the attitude of the Borough Councils. In other words, the MRWS process could not be continued without approve of the County Council.

However, in reality, no major change was observed in the attitude of the Councillors on the County Council, which has been sceptical about continuing the process from the beginning, and this led the MRWS process to halt with a withdrawal resolution of the County Council.

¹ Radioactive waste that is already preserved. This term is used especially in order to distinguish it from radioactive waste that will be produced from nuclear power plants newly constructed.

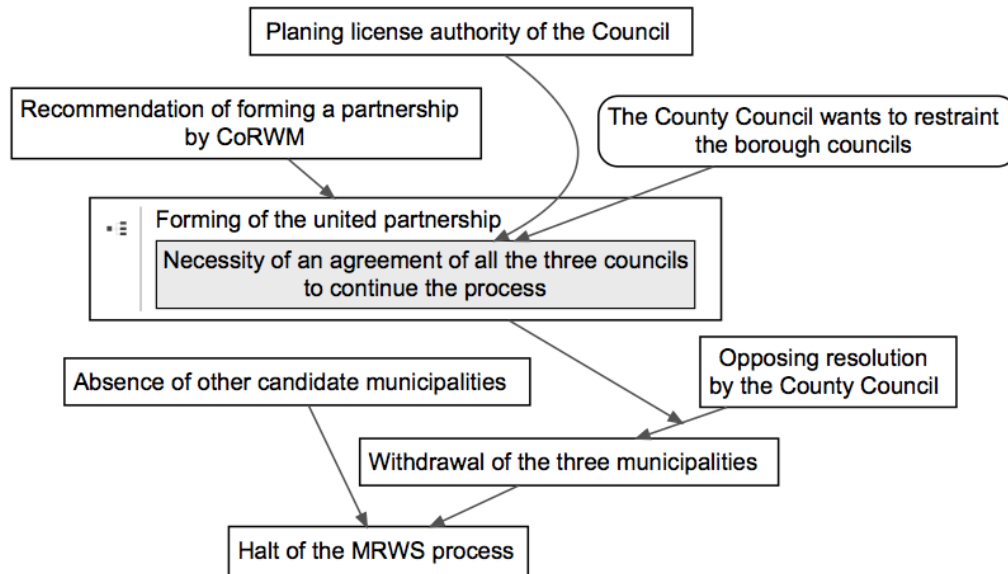


Fig. 4 Causality diagram for substantial authority of the County Council

c. Limited participation in the public deliberation

The partnership as a means of public deliberation was, by definition, supposed to have been carried out in order to encourage the participants to continue the discussion with various stakeholders, but in fact, the number of Councillors who participated in this partnership was only 4 out of 84 members, and moreover, only one among them was in the Cabinet and accordingly had a vote on the decision²⁹⁾. This low rate of participation of Councillors is probably because the term of 4 years in office is much shorter than the period of radioactive waste project which takes about 100 years (in the case of geological disposal) and that of isolation of radioactive waste from humans' activities that takes a several million years.

Furthermore, it is also because the management project is not popular among residents, and thus many of them did not take the incentive to be engaged on this subject. This tendency was especially remarkable in the attitude of Councillors who were elected from the other part of Cumbria than the west part where Sellafield is located. A statement by a Councillor in a meeting supports their reluctance, which says that radioactive waste management is "*a National issue*³⁰⁾" and should not be imposed on the local level: This can be read that the councillors did not want to participate actively in this project.

Also, information about the activities of the second CoRWM, the successor of CoRWM, was almost not disclosed to people, although the second CoRWM participated in the partnership as an observer. According to an interview that the authors conducted, their communicative activity was limited due to budget constraints of the Government that was attributed to the second CoRWM. The lack of involvement in these activities of public deliberation by Councillors, who had substantive authority in the process, might have created the inconsistency between the final resolution and the recommendations of the partnership. In addition, it is reported that petitions from environmental groups have been made to Councillors, and that the chairman of the County Council had a negative view towards the project. It is possible to assume that this influenced many Councillors who did not participate in activities of the

partnership. As for Government policy, the turning around in 2008 to build new nuclear power plants, as well as its insufficient response to the doubts which surfaced during the discussion of the partnership, such as withdrawal rights and the details of compensation, have been questioned. The above factors can be considered to have contributed to the resolution of the Council to withdraw from the process.

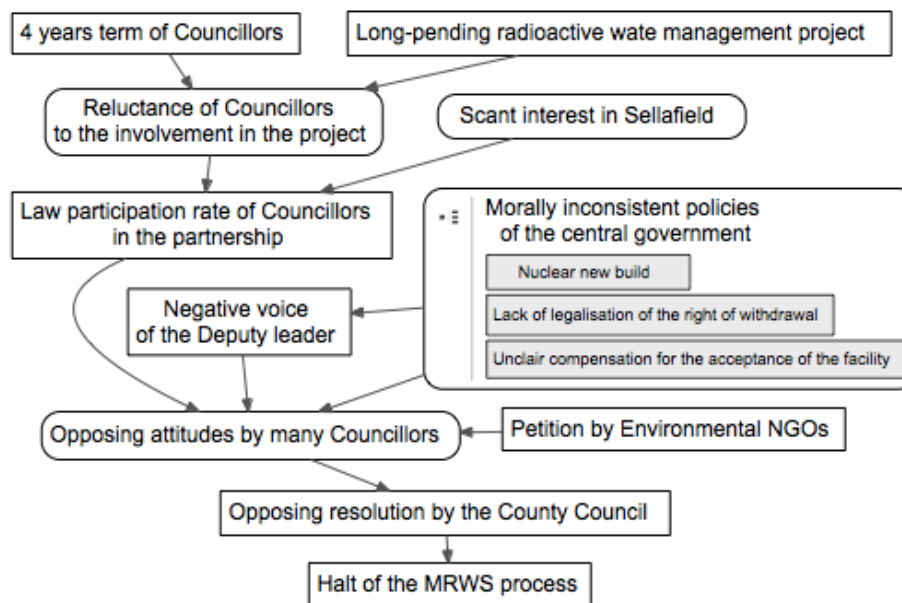


Fig. 5 Causality diagram for limited participation in public deliberation

5. Reinterpretation of the political process and examination of the role of public deliberation

5.1. Identification of the factors that affected the results

From the figures of the causality analysis carried out in the previous section, the factors that are located at the top of the figures are identified, which can be considered to have affected the results of the project. For simplicity, several factors in the figures are summarised properly here.

From the case in 1997, "political constraints" and "recognition as a technical problem" were extracted from the analysis of the closed site selection process (Fig.1), so did "many years of dependence on the nuclear industry" and "large amount of storage of waste" from the analysis of the single candidate (Fig.2).

From the case in 2013, "many years of dependence on the nuclear industry", "large amount of storage of waste" and "bad image of nuclear power and radioactive waste" were extracted from the analysis of the single candidate (Fig.3). The analysis related to a substantial final decision of the County Council (Fig.4) gives "the authority of the County Council of planning licence" and "partnership proposal of CoRWM in favour of discussion" as the influential factors, and the analysis of the limited participation in the public discussion (Fig.5) gives "four years of

term in office", "long period of radioactive waste disposal", "scant interest in the project" and "morally inconsistent policy about nuclear energy". Here, a factor called "petition from the environmental groups" in Fig.5 was not identified as an influential factor, because this phenomenon was observed in the case of several countries¹⁾²⁾⁴⁾ and thus it is less important as a factor specific to this case.

Because the result of this project is considered to be significantly influenced by these factors, it is important to think about measures corresponding to each factor in order to continue the discussion and to develop of the project. In the next section, the impact of public deliberation to these factors, as well as the factors which remained consequently as a challenge are examined.

5.2. Reinterpretation of the political process: Was the public deliberation able to contribute to moving forward in the process?

This section focuses on the activities of public deliberation that the United Kingdom employed (which are the CoRWM and the West Cumbria MRWS partnership), and re-interpret the political process of this case. The outline was described approximatively in the chapters 3 and 4, but here a reinterpretation is carried out because detailing the influence of public

deliberation in the result may enable us to obtain useful knowledge, which would be beneficial in similar cases in the future needs advice.

In response to the selection failure of Nirex of 1997, CoRWM was established to restart the discussion of radioactive waste disposal without any a priori constraints. The main objectives of their activity are "to propose technical solutions to radioactive waste disposal " and "to gain an understanding of the people", which were emphasized in the Terms of Reference³¹⁾. In the final recommendations, CoRWM effectively arrived to suggest technical solutions such as "geological disposal and robust interim storage" and to propose a process which can be socially accepted such as “respect to the voluntarism of candidate municipalities” and “public deliberation by forming a partnership”, after a series of participatory discussions.

It should be taken in the context that, in addition to regaining the trust of the Government and the executive organisations which had fallen, there was an aim to make each citizen aware of the issue by opening the discussion and accordingly setting it as a national agenda. From this point of view, the activity of CoRWM resolved an issue which appeared in the case of 1997 such as the recognition of radioactive waste disposal as "a technical problem" and “political constraints” in site selection, since they no longer accepted previous constraints and discussed the best methods freely.

The activities of CoRWM are globally appreciated, judging from the articles which treat this subject and the words in the interviews done by the authors. It is probable that the Government also evaluated them to a certain extent, since it started the MRWS process based on the partnership, respecting the recommendations by CoRWM which were announced two years before.

The West Cumbria MRWS partnership, thus established, aimed at that time to support the decision making of moving forward into the fourth phase (desktop research) by candidate municipalities. The discussion, in which Councillors and delegates of concerned organizations participated, was held in a comparatively calm ambiance. For example, one of the participants, Cumbria Tourism's policy and performance director said "*after very careful consideration of the facts currently available, (Cumbria Tourism) take a neutral stance on whether a nuclear waste repository should be based in west Cumbria*" because "*there is inconclusive evidence that such a repository would have a detrimental impact on the economy and the environment*"³²⁾, regardless of the possible impact to the tourism industry by the siting of a disposal facility: It is possible to observe calm consideration in this consultation process. Copeland council and Allerdale council were, in practice, resolved to continue the involvement in the process with regard to the final recommendations of CoRWM.

However, the other part of Cumbria excluding the west has been continuing to take a potentially opposite attitude towards the project, and this fact contributed to the withdrawal of the councils in the 2013 case. The councillors from the area where the project is regarded in a negative way were absent from the discussion of the partnership, even though the unanimous agreement of the three councils was set as a necessary condition to move forward, led by the recommendations of CoRWM and the planning license authority of the County. That is, even if the transition to the fourth phase of the process in the discussion of the partnership were supported, it was not sure whether the Councillors on the County Council would adopt a similar attitude to that of the partnership.

The UK attempted to move the project forward using public deliberation, the situation that Cumbria is the sole candidate did not change even in the case of 2013. The factors "many years of dependence on the nuclear industry" and "mass storage of waste" are facts in the history of Cumbria and stable in the public deliberation in the framework of radioactive waste disposal: any discussion can neither change the history of dependency nor reduce the amount of radioactive waste already in storage. Therefore, in the use of public deliberation, what should be solved is the factor "bad image to the nuclear energy and radioactive waste". In particular, the municipalities other than Cumbria did not expressed their interests in the process partly

because of this factor. The efforts of CoRWM can thus be interpreted to be insufficient in this respect.

Hence, it is possible to interpret that public deliberation was not efficiently utilized in this case, judging from the facts that there existed limits to the possible problem to be solved by public deliberation, and that many of the Councillors, the final decision-makers, did not participate in the activities of public deliberation. Yet, public deliberation is originally a measure to foster the awareness of the problems and consider the solutions, continuing the discussion with participation of a variety of stakeholders. In order to envisage the usage of this, it would be necessary that the decision-makers participate in the discussion, after disturbing factors are identified and eliminated.

In this study, the Councillors were assumed to be decision-makers, which is reasonable in view of the system of the local governance in the United Kingdom. The first reason is that the local authority of the United Kingdom often has a form of Cabinet-styled government: The chief of the local authority rarely exists, and a Deputy leader who is elected among the Councillors plays the role as a chief, yet he is elected by the residents in a direct election³³⁾. This is the case in the three Councils which participated in the MRWS partnership. The second reason is that the Members of Parliament (MPs) elected from each constituency in a general

election do not have legal authority for radioactive waste and nuclear-related projects. Hence, the influence of MPs on the decision of the County Council in this case might have been limited.

As a matter of fact, the six MPs elected in the constituencies of Cumbria stated in favor of inviting the final disposal facility at Cumbrian committee, but the County Council did not consider it to be important. Moreover, in the constituencies in Cumbria County in 2013, the majority of the MPs elected from this area was from the Labour party³⁴⁾, while the majority of the Councillors who had votes was from the Conservative Party³⁵⁾. Therefore, it can be interpreted that the County Council was endowed with the right of decision-making in this case.

Another thing is, the following two factors allow us to perceive that the lack of confidence in the Government is essential to the result of this case: Namely that no municipality other than those in Cumbria expressed its interest to the MRWS process, and that, even in Cumbria, prudent attitudes towards the site selection prevailed. The causality analyses show the factor of distrust of the Government and the executive body, and this is confirmed by an interview conducted by the authors which stated that the local municipalities in the UK are antagonized by London where Central Government is located²⁷⁾. Prior to the attempts at open discussions between the Government and local municipalities and residents, it is necessary to arrange the conditions for calm discussion such as modifications to the relevant policies on nuclear power

into more consistent ones with the moral point of view. Based on that, public deliberation will perform effectively in the form of partnership (not necessarily a joint partnership, after taking into account the size of the candidate municipalities, the culture of consultation etc.) and conducting one consultation activity after another.

6. Conclusions

The objectives of this study were the following: to clarify the political process of the UK's radioactive waste management, to estimate the cause of this unsuccessful result, and to obtain an indication on the effectiveness of public discussion.

In order to achieve these objectives, first, the political process of the case was described in detail. Towards the late 1990s, the British Government, in order to select a site for disposal of radioactive waste, have adopted a policy that did not focus on the terms of social acceptance of radioactive waste management. This way of approaching the candidate municipality of Cumbria created strong opposition by residents and thus the project was halted. The Government reflected on this failure, and it decided to reorient its science communication policy which aimed for social acceptance of science and technology. Out of this context was

born the CoRWM, which was supposed to examine radioactive waste management policies and make recommendations on them, and it finally suggested the establishment of both a partnership for the site selection process based on voluntarism of candidate municipalities and the development of the project with activities of public deliberation; it concluded that geological disposal was the best solution at that time. After 3 years of engagement in the MRWS partnership, namely formed by the Cumbria County Council and the other two Borough Councils in Cumbria County, the final report was published which recommended moving forward to the next step: a desk top survey. However, the Cumbria County Council voted against the transition in 2013 and thus all the three Councils withdrew from the process because there was agreement about their unanimity to proceed to the next step.

Next, based on the description of the political process in chapter 3, causality analyses were conducted from the points of view which were considered to be important. For the 1997 case, the analyses were done from the viewpoints of "closed site selection" and "Sellafield as a single candidate", and for the 2013 case they were done from the viewpoints of "Cumbria as a single candidate", "the substantial authority of the County Council" and "limited participation in the public deliberation". Then the factors located upstream of these causality figures are identified, and the reinterpretation of the political process as summarized previously was done focusing

on the public deliberation.

CoRWM again considered radioactive waste disposal to be an issue of social acceptance rather than a technical problem, and publicly disclosed information through the activities of public deliberation. These engagements can be considered to have partially solved the problems that appeared in the case of 1997. On the other hand, the MRWS partnership, which was established in response to the recommendations of CoRWM, had a low participation rate of Councilors on the County Council, even though they had substantial decision-making authority on this project. In addition to that, because Cumbria, except for West Cumbria where Sellafield is located, was not much interested in this project, and because the policy of the central government promoting the build of new nuclear power plants was not morally consistent with radioactive waste management, the project was halted in 2013 in response to the opposing resolution of the County Council. From these observations, a suggestion for the use of public deliberation can be obtained: it can be effective when performed under consistent policy, in a way that encourages the major decision makers to participate, and when continued on with an appropriate scale.

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