Briefing Note

How Expert Communities Contribute to the Arctic Governance Systems as and beyond Knowledge Holders

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Introduction

Arctic governance is structurally a complex mechanism, but fundamentally it is a political field that distributes social resources through some policy-option procedures. Expert communities have always played the role of innovators and guides in social development and human progress. Arctic affairs are a combination of global and local public affairs. The knowledge-based authority of experts has helped them to gain great influence in the Arctic international governance agenda. This influence is not only reflected in their contribution of knowledge but also in their role to form the rules in governance systems. The theme of the International Polar Year IPY Montreal Conference in 2012 is "from knowledge to action," which shows that expert communities are not satisfied with only publishing scientific facts and knowledge but are willing to take more active actions and inputs in influencing policy shaping and making. This article focuses on the power sources, mobilization capabilities, and institutional contributions of the expert communities in participating in the political process of global governance.

The needs for knowledge for the evolution of Arctic governance system

The diffusion of knowledge is a process that moves from discovery by the few to common knowledge by the many. The dynamics of social acceptance of the diffusion of scientific knowledge are generally twofold: first, when knowledge becomes a necessity for members of society and, at the same time, an important tool for the development of productivity and international competitiveness of a country. This was evident in the early stages of industrialization. The second is when scientific knowledge reveals common challenges and crises faced by society and the public and when such crises require a concerted effort by members of society (or the international society) to address them. The second situation is more in line with the needs of

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governance in the era of globalization. The way of allocating resources by market forces or by a single national government is no longer able to solve some of the major problems that transcend national boundaries and affect the whole world, such as the environment, ecology, climate, infectious diseases, and so on. The capacity and role of Arctic expertise community in steering global governance in the era of globalization and information technology is beginning to expand.

Knowledge has decisive significance for the evolution of governance systems. The lack of knowledge accumulation will limit the depth and breadth of institutional innovation, and the increase in knowledge stock will help improve human society's ability to discover institutional imbalances and to take a move to create some changes. Human exploration and research on the Arctic are still quite insufficient, especially the accumulation of knowledge on the relationship between Arctic changes and the entire Earth system. Many reports on Arctic governance emphasize the important role of knowledge. [1]One of the main contradictions faced by Arctic governance is the contradiction between the increased human activities in the Arctic and the relative lack of systems of Arctic governance. One of the real reasons for the gap in governance is the lack of knowledge. Limited knowledge will affect the speed, depth, and breadth of the formation of Arctic governance systems.

The demand for knowledge in Arctic governance is multifaceted. In summary, there are approximately four kinds of knowledge required, namely: the first kind of knowledge is about observing and the relevant facts. The second kind of knowledge is about technologies and means for ecological and environmental protection; The third kind of knowledge is about sustainable development knowledge and technology innovation; The fourth kind of knowledge is about the belief system that are helpful to form governance system. The above four kinds of knowledge are interrelated and jointly construct a knowledge-based support system for the Arctic governance system. The expert communities need to acquire these four kinds of knowledge and organize them into a social system with a professional and scientific spirit.

The first kind of knowledge is the systematic integration of information on various changes in the Arctic natural environment, such as climate change, glacier retreat, sea ice melting, and other information that affects the natural and social ecosystems of the Arctic. These scientific data obtained through observation can reveal the causal relationships behind phenomena, and scientists can make predictions and confirm certain inferences based on data. The continuous improvement and enrichment of the database have promoted the accumulation of knowledge about Arctic changes, which is conducive to improving the predictive ability of the assessment system. The series of reports of the Arctic Council's Arctic Monitoring and Assessment Program (AMAP) play a fundamental role in ranking the urgency of the Arctic governance agenda in the formation of the Arctic governance system. [2]

The second kind of knowledge is about technologies and means of ecological and environmental protection. The third kind of knowledge is about sustainable development knowledge and technology. The second kind of knowledge and the third kind of knowledge involve two aspects of the Arctic issue: one is to protect the Arctic, and the other is to pursue interests and development. The balance between the second kind of knowledge and the third kind of knowledge just reflects the sustainable concept of seeking development through effective protection. To achieve a balance between the two, knowledge-based technology applications and management solutions are needed. The scientific discoveries and knowledge accumulation of the Conservation of Arctic Flora and

Fauna (CAFF) and the Protection of Arctic Marine Environment (PAME) help establish governance in various fields of the Arctic based on accurate scientific data and ecological logic. The expert groups have proposed systematic and coordinated principles for Arctic governance regulations from the top-level framework, providing a foundation for principle-based governance. The expert groups have completed various reports on the impact of climate change on Arctic flora and fauna, Arctic fish, and local communities through research, providing a basis for determining the goals and timelines in specific-functional Arctic governance. In terms of biodiversity, scientists have conducted a series of assessments in Arctic protected areas from the perspective of ecological and social significance. Based on depicting the internal connections of the Arctic ecosystem, they have provided a well-designed protected area division and protection measures for local governments. The third kind of knowledge requirements mainly come from the response of technology applications for business. The resources and waterways of the Arctic region will be further integrated into the global market. To achieve sustainable and moderate development, it is necessary to ensure that the speed and scale of development are within the range that the Arctic ecosystem can support and to innovate green technologies and production methods. Technological innovation and knowledge reserve regarding resource utilization in fragile environments are the technological foundation for improving the Arctic governance system.

The fourth kind of knowledge is the belief system required for the social support of Arctic governance systems. Both political and economic arrangements in the system require extensive social support. Sharing the belief in knowledge, information, and governance objectives only among expert groups and decision-makers cannot enhance governance systems. Once a knowledge system is widely accepted by the public in a certain society, it will stimulate and accelerate the rearrangement of the political and economic system of that society. When the popularization of the knowledge system reaches a high level that can form a belief foundation for institutional change, it can provide a shared value and belief. Moreover, the popularization of these knowledge systems can actually reduce the cost of institutional change and promote rapid prototyping of governance institutions. Public support for Arctic governance goals largely stems from such a belief system.

The fourth kind of knowledge is crucial for international cooperation in the Arctic. Arctic governance is a global governance that includes multinational cooperation. Due to the nature of the tele-coupling of some Arctic issues, such as climate change, glacier retreat, and protection of migratory animals, Arctic governance needs to be coordinated between Arctic and non-Arctic countries. The transnational governance system aims to maintain the normal order of the international community and achieve long-term coexistence between humans and nature. The international organizations tasked with Arctic governance need scientific knowledge and the community of experts to support their authority and rationality that helps to establish new international moral and ethical standards, as well as related evaluation standards centered on fairness and impartiality. The community of experts can mobilize social capital and, make positive international commitments related to governance from various major relevant governments, and establish international principles, norms, standards, policies, agreements, etc. The Arctic Council's inclusion of China, India, South Korea, Japan, and other non-Arctic countries as observers is actually meaningful for spreading Arctic knowledge to countries outside the region. The operations of the China Nordic Arctic Research Center (CNARC)[3] and the North Pacific Arctic Conference (NPAC)[4] are also a kind of practice for the expert community to coordinate international action through knowledge dissemination platforms.

Knowledge is Power: How Expert Communities Gain the Influence on Governance Systems

Power is the capability of an actor to lead or to constrain other actors in the actual political process, relying on a certain strength advantage, resource advantage or institutional advantage, in order to realize certain interests or principles. Arctic governance is an action that requires a series of changes in the way that members of society behave (e.g., how they produce, how they consume, how they allocate social resources). Experts on Arctic issues do not have the advantage of political resources, but only immaterial resource ----knowledge. So the first thing they can do is to influence decision-makers and the public by taking advantage of their independent intellectual insights and sharing knowledge. Decision makers are the groups with the ability to allocate resources, and the public are the taxpayers and voters who are able to express their support for or opposition to the policy of reallocation of resources.

According to Joseph Nye's concept, soft power is the ability to achieve a desired goal by attraction rather than coercion. [5] It can work by persuading others to conform, or by persuading them to agree to norms or institutions that produce the expected behavior. The intellectual soft power possessed by a community of experts can result in the formation of scientific ideas or cultural attractions, which in turn result in the formation of standards, institutions and values that can shape the preferences of others. If the concept of soft power is used to look at the roles of expert communities, it is clear that the systematic education of knowledge by expert communities is the use and exertion of this kind of soft power. Most of the individuals educated in this way are persuaded to follow the "laws of science" and to submit to a certain ethic based on knowledge.

An examination of the process of shaping the Arctic governance system can tell us that Arctic governance is a democratic process of public policy. What role does the community of experts play in this process? The purpose of democratic decision-making on public affairs is to allocate the responsibilities, obligations and rights of members in a society in a sensible and reasonable manner, to allocate public resources available for governance, and to resolve problems appropriately, while maintaining shared values. It is difficult to strike a balance between efficiency and fairness. Because each individual has his or her own small in-group interests, in most cases people will accept the rulings of the social system and the results of the democratic process, but are unwilling to make concessions to other groups or majority group interests. The combination of scientific procedures and democratic decision-making makes political decisions much more rational and effective. After understanding the facts and evidences of science, a consensus on the policy options can reached, and the responsibilities, interests and resources are redistributed among the members accordingly.

The professional training of scientists includes the advocation for the free flow of information and knowledge, which makes scientists relentlessly insist on their right to disseminate and interpret "facts" and "truths" globally. The exchange of information among scientists is also governed by the long-established rule of the game that one can oppose any assertion or conclusion, but not "the rationality of the free flow of information and the open debate of ideas", which is tantamount to giving scientists the morality and rationality to engage in social mobilization and political debates around the globe on international governance.

Global governance is a public affair without a so-called world government to provide public goods.

The original intention of scientists to participate in governance and demonstrate mobilization is driven by their social responsibility in the global context. When they find that the resources for governance are not allocated as they expected, they will think about fully playing the mobilization capacity for global governance.

John G. Ruggie introduced the concept of epistemic community into the study of international organizations. [6] Epistemic communities are networks of experts and scholars in a given field who are recognized by the public for their professional authority and who use their transnational network platforms to influence or change the process and outcome of policymaking. Epistemic communities play an important role in the formation of shared values and the construction of transnational networks. The core of epistemic communities is the community of experts who hold the power of knowledge, and the authority of epistemic communities depends on the authority of experts' knowledge and information. Epistemic communities guide the rational allocation of social resources through the possession of knowledge, information and develop new modes of governance through the dissemination of new information and ideas, thus effectively achieving policy coordination and international governance. In the past half century, in the global protection of the ozone layer, the control of acid rain in Europe and the control of pollutants in the Mediterranean Sea, the epistemic communities centered on the community of experts have played a great role and promoted the development of international governance systems. Epistemic community members can institutionalize their knowledge in three ways: first, by setting development goals; second, by forming coalitions of opinion and action in support of knowledge-based policies; and third, by creating organizational entities for international governance based on their knowledge. [7]

International governance activities are highly democratic, as there is no strong executive power on international governance platforms similar to that found in domestic politics within a country, and international governance activities enjoy more freedom of information dissemination with few restrictions similar to those found in domestic politics. In this context, expert communities enjoy a wider range of participation and have the opportunity to bring their modes of discussion and interaction to international governance platforms. At the level of international organizations, they are often in a position to shape the orientation and content of international law and agreements on the basis of scientific findings.

The role of experts in the negotiating process related to Arctic governance——beyond the knowledge holders

The public does not doubt the identity of expert groups as knowledge holders in Arctic governance. Nonprofessionals consider popular scientific conclusions as the whole of science. But scientific explorers know that these conclusions constitute "science" only when they are linked to the methods used to reach them.[8] Knowledge has characteristics such as the authority of truth and the complexity of the system, which can have an impact on the way human society is organized and managed. When various expert communities enter the governance process, they are not satisfied with only informing the public and decision-makers of scientific conclusions, but are willing to make institutional contributions to the effectiveness of governance. They implant the logic of science into the ideology of governance in the name of scientific popularization, the methods of scientific decision-making into the governance system, and the evaluation methods of scientific indicators into the governance process.

A set of institutional systems has been formed for the accumulation, acquisition and exchange of knowledge among experts. Transplanting this interactive mode of experts to the field of governance will have an impact on the negotiation of the governance system and the negotiation of governance goals. The larger the proportion of experts participating in a certain governance system, the easier it is for this system to become the mainstream system. Both scientific debate and democratic debate are a kind of discourse. The goal of a scientific debate is to reach a consensus on the "fact and truth" of some discipline. The goal of democratic debate is to reach a consensus on social public choices in a certain situation. The institutional formation process of Arctic governance is a combination of the above two consensus-building processes. They have something in common with the spirit of democratic co-governance. This commonality has a good ethical basis for the formation of corresponding institutional arrangements.

At the negotiating table for the Arctic governance for a specific regime, many players emerge. There are power holders, such as governments. Governments have the power to redistribute social resources. There are capital holders, such as corporations, who have the capital to develop various projects and industries. There are right holders, such as indigenous people. The Arctic indigenous people have important rights over the disposal of local resources while preserving their own rights to subsistence, way of life and cultural traditions. In Arctic affairs, the manifestation of such rights helps to enhance the favorable position in negotiations.

There is no doubt that, as analyzed earlier, expert communities are knowledge holders. In addition to being knowledge holders, expert communities may also play the role of right holders, competitors for policy options, pressurizers, and coordinators at the Arctic governance negotiation table.

Playing the role of right holders

When the expert community talks about "sustainability", it often makes the following statement: the Earth is the only home on which human beings depend for their survival, and cherishing and caring for the Earth is the only option for human beings. Instead of developing in a destructive way, we should seek the path of sustainable development. We have to be responsible for future generations, while at the same time thinking about the present generation. Here, the community of experts has become a spokesperson for the rights of future generations. When the expert community talks about "biodiversity conservation", it actually becomes a spokesperson for the rights of other species (e.g., polar bears) by presenting data from scientific monitoring.

Playing the role of competitor and that of pressurizer

The expert community can represent global interests in competing with governments on Arctic policy options. The community of experts could also propose some different governance programs with governments when the community of experts believes that the policies of certain governments are problematic.[9] If governments are not willing to invest social resources in environmental protection, greenhouse gas emission reduction and environmental legislation, many governance ideas will remain on paper rather than being translated into action. Through the work of expert groups in international organizations or through the pressure of public opinion, the expert community has urged governments to enact laws, regulations and other mandatory measures to encourage enterprises to regulate their behavior, reduce or eliminate economic practices that do not guarantee environmental protection. Through media campaigns and international lobbying, the

community of experts has led international organizations to adopt guidelines and declarations, thereby creating public pressure on Governments and enterprises.

The role of the community of experts in helping international organizations to enhance their independence and authority. The development of international organizations reflects the trend towards democratization of international relations and the characteristics of science-based decision-making. The increased role of the community of experts in international organizations is a reflection of this trend. Members of international organizations, especially the major Powers, often have a real veto or a great deal of dominant power in the activities of international organizations. In such cases, the intellectual authority of the community of experts is an effective means for international organizations to increase their independence and enhance their negotiating power with member states. In the context of sustainable development and global governance, international organizations encourage scientists to engage in science diplomacy and professional forums, which provide an intermediary link for consensus-building in the dialogue between governments.

Acting as a coordinator among multiple international governance systems

The complex and overlapping layers of international organizations involved in Arctic governance create an expectation of coherent and organic linkages between the various international mechanisms. The expert community plays an important role as a coordinator. Scientists participate as experts or advisers in various fields of Arctic governance and in various international organizations. On the one hand, they can follow the track of the progress of various fields and organizations, and on the other hand, they can use their expert status to carry out coordination, promote discussion among various disciplines on important issues, and promote the consistency of goals in various governance fields. The expert community can utilize its professional strengths to organically combine various governance objectives.

Roles of expertise at different phases of the Arctic governance

Arctic expert communities fit the characteristics of an epistemic community that has the ability to play a significant role in the process of Arctic governance such as setting the agenda or establishing rules and regulations. On the one hand, Arctic expert communities define the nature of Arctic issues through long-term scientific research and work to make policymakers aware of and address the challenges facing the Arctic; on the other hand, expert communities are important transnational actors who can use their transnational networks disseminate knowledge and consolidate established consensus, promoting fact-based governance policy and international cooperation.

In the first phase, the main role of the expert community is to identify and raise issues. It should be noted that the Arctic issue's emerging in international politics is largely related to climate and environmental changes in the Arctic region. The Working Group of the Arctic Monitoring and Assessment Programme released a report "Snow, Water, Ice and Permafrost in the Arctic" in 2011.[10] The fact that the temperature in the Arctic region is increasing has been confirmed, which has greatly affected the perception of the Arctic region by the public and decision-makers. The Arctic region regulates the global climate. Against the background of global climate change, all aspects of the Arctic system have undergone the fastest changes in the past 400 years, even exceeding scientists' expectations. Because of this, policymakers and the public are increasingly paying attention to the Arctic. The international scientific community refers to the intricate

environmental changes taking place in the Arctic as the "unaami". This term, derived from the Inuit, indigenous people in the Arctic, means "unknowable tomorrow", which expresses the worries of scientists all over the world about the unpredictable and uncontrollable future of Arctic environmental changes. The "unaami" phenomenon mainly has the following characteristics: 1. The surface temperature of the Arctic land continues to rise. 2. Decrease in sea ice coverage in the Arctic Ocean. 3. The edge of the Greenland ice sheet is melting. 4. Continental snow cover and permafrost cover decreased, permafrost thawed, and river and lake ice decreased. 5. Increases in freshwater runoff, rainfall and snowmelt have reduced sea salinity in the Arctic Ocean, which has an impact on the cycle of the world's oceans. 6. Ocean warming. 7. A decline in sea level atmospheric pressure in the Arctic.

The experts define Unaami as the ongoing decadal, pan-arctic complex of intertwined changes in the Arctic physical system. The physical changes, in turn, alter the ecosystem and living resources and impact the human population. Thus, these biological and societal consequences may also be considered part of Unaami. The scientific community's definition of the issue of natural changes in the Arctic is related to the future of the earth and mankind, which naturally raises the attention of the Arctic in international affairs.[11]

The experts have developed four working hypotheses to guide research: (1) Unaami is related to the Arctic Oscillation related to temperature and ocean circulation. (2) Unaami is a component of climate change. (3) Feedback among the ocean, land, ice, and the atmosphere is critical to Unaami. (4) The physical changes of Unaami have large impacts on the arctic ecosystems and society. The experts define their mission as follows: to find out whether the recent Unaami is tied to anthropogenic climate change or not, to describe (and ultimately attempt to predict) the ecosystem effects and societal impacts of Unaami, and to distinguish between the changes associated with the large-scale physical Unaami phenomenon and the changes due to human activities.

In the second phase, the role of the expert community is to disseminate new ideas and form a social consensus to promote "knowledge-based policy." The Arctic epistemic community has been working to bring the conclusions of scientific research into public awareness, a similar process like Townhall meetings to bridge the communication gap between the elite and the public, get every member of the society well-informed about updated facts and truths and plans. Misinformation is costly for each governance objective. In this phase, it is essential for the efficient flow of information and communication, including the feedback from the public.

Norwegian scientists hosted a three-year project called SciencePub under the initiative of the International Polar Year.[12] That is to continuously improve the public's awareness of the Arctic natural environment through active publicity activities. These publicity activities include establishing an information-sharing network covering all partner institutions, training science journalists, and launching visualization and mobile exhibitions. It is worth noting that epistemic communities often collaborate with NGOs in the process of building consensus between the public and the policymakers. In fact, the most well-known role of NGOs is that of "advocacy networks," which seek to influence policy by mobilizing public opinion to directly or indirectly put pressure on influential policy networks and groups and change policies. [12] For example, one of the important reasons why the issue of Arctic fisheries can quickly become a hot topic is the initiative of scientists and the lobbying of environmental NGOs. At the International Polar Year Conference held in Montreal, Canada in April 2012, The Pew Charitable Trusts of the United States distributed

to the participants a letter of initiative signed by 2,000 scientists around the world, calling on governments to sign an international agreement on preventing uncontrolled commercial fishing in the central Arctic Ocean until a full scientific investigation is completed. [13] It shows that after the expert community reaches a consensus that is disseminated through the introduction of the media, enter the discourse system of decision makers and the public, a governance system begins to take its shape.

In the third phase, the expert community can provide policymakers with various policy options and their scientific basis. For example, as the most important working platform in Arctic governance, the working groups of the Arctic Council released a number of assessment reports based on scientific research at the Eighth Ministerial Conference in 2013, such as the "Arctic Biodiversity Assessment", the "Arctic Marine Assessment Report", etc., carried out a scientific assessment of the current situation of the Arctic environment, and put forward a series of follow-up measures and guidance suggestions. The Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (MOSPA)" adopted in 2013 is the second legally binding agreement since the establishment of the Arctic Council after the Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic (SAR). The agreement is a precautionary measure by Arctic countries trying to curb large-scale oil and gas resource extraction in the Arctic in the future. It can also be regarded as a declaration that the Arctic Council will prioritize the protection of the environment and biodiversity in the Arctic region. Although policy choices cannot be entirely attributed to the expert community, it is clear that the highly specialized knowledge and information possessed by the expert community provide policymakers with a basis for policy choices, making it easier for policymakers to choose among existing policies to determine priority items on the agenda.

In the fourth phase, the role of the expert community is to maintain policy continuity through institutional design. The fourth phase is the deepening and institutionalization of the first three phases. Advancing international governance will inevitably involve interest calculations and power games among all parties involved. Disputes between different countries and interest groups can also shake the governance consensus that has just been established. Some countries and industries will also adopt negative policies for international cooperation in governance due to changes in the economic and political environment. Therefore, establishing a solid system is the key to ensuring policy continuity. While assisting in the construction of the governance system, the expert community must also institutionalize its own influence. Taking the governance of Arctic high seas fisheries as an example again, scientists have cooperated with NGOs to not only complete petitions, and publicize them, but also exert pressure on governments. They spent about five years in extensive discussions with governments, fisheries leaders and Indigenous leaders to seek an international agreement to protect Arctic high seas fisheries. In July 2015, under the impetus of the expert community and NGOs, the governments of the Arctic Ocean littoral countries signed a non-binding joint statement, no longer authorizing their fishing vessels to fish in the relevant waters.[12] In October 2018, the five Arctic littoral countries as well as five non-littoral countries (Iceland, China, Japan, South Korea and the European Union) signed the "Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean" which initially established the order and model of fisheries governance on the high seas of the Arctic Ocean.

In summary, the system of international governance is a regulatory system for maintaining the

normal order of the international community as well as for realizing the goals of sustainable development. Modern global governance is a highly complex operation. If international organizations of all kinds are to gain more legitimacy and authority, they need to be supported by a scientific basis and governance tools, as well as a community of experts to educate the public in science and guide public opinion at the level of values and ethics. In adjusting the international system of Arctic governance, it is necessary to regulate international relations and order and to improve various international principles, norms, standards and procedures. In this process, expert communities have a remarkable ability to use their scientific knowledge to design and improve the system of Arctic governance, as well as to use their intellectual authority to mobilize social resources more broadly to achieve governance goals. Expert communities can provide Arctic governance with the scientific belief systems needed to build governance systems. New knowledge systems, once widely recognized by society, can stimulate the reorganization of societal governance systems and encourage governments to increase their investment in scientific research. By turning scientific discoveries, experiences and information into systematized knowledge, and by strengthening international learning exchanges and scientific and technological cooperation, expert communities have accelerated the accumulation of knowledge stocks as a whole and increased the momentum for change in the Arctic governance system.

Notes

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2. http://www.amap.no/about/the-amap-programme/amaps-priority-issues.
3. The China-Nordic Research Center (CNARC) was established in Shanghai in 2013 by 10 Member Institutes, four Chinese and six Nordic, which all have capacities to influence and coordinate Arctic research. CNARC's purpose is to provide a platform for academic cooperation to increase awareness, understanding and knowledge of the Arctic and its global impacts, as well as to promote cooperation for sustainable development of the Nordic Arctic and coherent development of China in a global context.
4. Each year since 2011, a diverse group of Arctic specialists, researchers, practitioners, policymakers, private-sector representatives, and Indigenous Peoples and other community leaders from a variety of countries have met at the North Pacific Arctic Conference for wide-ranging discussions on Arctic issues, with a particular focus on the North Pacific region. the North Pacific Arctic Conference is Organized by East-West Center and supported by the Korea Maritime Institute.
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