BCS 312: Land and Environments of the Circumpolar North II

Module 8: Management of Aquatic and Terrestrial Resources and Environments

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Overview

The purpose of this module is to engage in collaborative research, information finding and discuss topics related to the management of aquatic and terrestrial resources and environments. In the context of previous course modules, past and current management practices are compared, resource management philosophies are analyzed, and successes and failures of international resource management are discussed. You may use the Internet, library, community elders or other available resources to gather this information. Materials gathered will be discussed in class and questions raised as a result of class discussion will become the basis for further information gathering and a second discussion in class.

Learning Objectives

Upon completion of this module, you should be able to:

1. Compare past and current management practices (e.g., active, passive) of aquatic and terrestrial resources and environments (e.g., forests, fisheries and wildlife including marine mammals) across the circumpolar North.

2. Explain how river management in the circumpolar North has changed over time and the conflicts regarding the use and protection of rivers.

3. Explain how concepts of resistance and resiliency as demonstrated in a cold climate are central to sustainable management of aquatic and terrestrial resources in the circumpolar North.

4. Analyze significant differences in resource management philosophies and practices between government agencies, the private sector and indigenous organizations in the circumpolar North.

5. Assess successes and failures of international management of aquatic and terrestrial resources (e.g., fisheries, wildlife, marine mammals, oceans and rivers) by two or more countries that span national borders.

Required Readings (including web sites)

Conway, T. 2008. Environmental Governance and the New Arctic Frontier: When the North Opens and Security Declines. pp. 29-31 "The Regional Management Framework".

Dankel, D., D. Skagen, O. Ulltang. 2008. Fisheries Management in Practice: Review of 13 Commercially Important Fish Stocks. Rev Fish Biol Fisheries 28:201–233. Read: Abstract (201); Introduction (201-203); Web Review of Case Studies (203-204); "Stock Reviews" and "Analysis of Management Performance" sections for each species: Lesser sandeel, North Sea herring, Icelandic cod, Barents Sea cod, sockeye salmon, Pacific halibut and Greenland halibut; Discussion (228-230) and Conclusions (230).

Usher, P. 2000. Traditional Ecological Knowledge in Environmental Assessment and Management. Arctic 53(2)183-193.

Suggested Readings

Potts T. and C. Schofield. 2008. Current Legal Developments in the Arctic. An Arctic Scramble? Opportunities and threats in the (formerly) frozen North. International Journal of Marine and Coastal Law 23:151-176.

Berkman P.A. and O.R. Young. 2009. Governance and environmental change in the Arctic Ocean. Science 234:339-340.

Key Terms and Concepts

Co-management: Devolution of power where public authorities include stakeholders as a formal part of policymaking and policy implementation.

Adaptive Management: Flexible management of an ecosystem or resource in the case of political, economic or biological changes.

Precautionary Principle: Taking action that postpones or diminishes use or extraction of a natural resource until the resource sustainability is known with more certainty.

Learning Material

Introduction

The goal of this module is to actively engage in information gathering, critical analysis and class discussion. Keep track of the resources used. Below is a suggested time line for this module, which is intended to be two weeks in length (10 class days).

Day 1 Choose a circumpolar region upon which you will focus and confirm your choice with your instructor. Discuss your choice and reasons why you chose it with classmates in class or online.

Days 1 – 3   Read the required readings and formulate at least three questions specific to your region based on the readings.

Day 3   Discuss the required readings with your classmates. Share your questions and discuss possible answers and sources of information to find answers.

Days 4 – 6 Complete Sections 8.1 to 8.5.

Day 7 Meet with classmates online or in class to discuss your findings to questions asked in Sections 8.1 to 8.5. Address topics including:

1. How effective has your information gathering been to-date?

2. Have you found any excellent information resources? Share these with your class. For example, you may have found a good location to visit with local elders or found informative websites.

3. Do your findings and experiences with information gathering and research differ from each other? What might be the cause of these differences?

4. Have you had difficulties in gathering information for certain sections or questions? Share this with your class and see if they have found information sources that could help you.

5. Share informative website addresses and website content with each other.

6. Compose two questions for each section (8.1 to 8.5) and share at least two of these questions with your class.

7. Through class discussion, select one student-generated question per section (8.1 to 8.5) to pursue further.

Days 7 – 9   Pursue information gathering for the five new class-generated questions focussing on the region of your choice or the circumpolar North in general. Using new web links and/or resources shared by your class during the Day 7 discussion, pursue follow-up research on sections for which you were previously unable to find suitable information.

Day 10   Final class discussion topics:

1. How did the information obtained from different sources differ? E.g., Internet vs. elders.

2. How did the second round of information finding differ from the first round? Was it more effective or more difficult as the questions changed?

3. Was the class discussion effective? How could it be improved?

4. Identify at least two things you would do differently to improve your information gathering experience.

8.1 Compare past and current management practices (e.g., active, passive) of aquatic and terrestrial resources and environments (e.g., forests, fisheries and wildlife including marine mammals) across the circumpolar North.

Focusing on the circumpolar region you have chosen and gather information about the following questions:

1. Identify past and current management practices for three or more of the following:

    a. Forests

    b. Fisheries

    c. Marine Mammals

d. Terrestrial Mammals

e. Non-renewable Resource(s)

2. For the three resources you selected:

a. Describe similarities and differences in how the resources have been managed in the past and how they are currently managed.

b. Why do you think differences exist in management practices for different resources?

c. Do you think management practice of these different resources will experience accelerated or decelerated change in the future? Why or why not?

3. List the information resources you used for this section noting which were most useful and why.

4. From the information you gathered, compose two questions you would like to follow up with your class.

8.2 Explain how river management in the circumpolar North has changed over time and the conflicts regarding the use and protection of rivers.

For this section and the first round of information finding, please address your questions and research to the circumpolar North in general and not specifically to your region of choice.

1. Identify three or more issues specific to river management in the circumpolar North.

a. Damming

b. Ice management

c. Human impact causing rising water temperatures

d. Hydrology

2. How does river management in the circumpolar North differ from river management in other areas? (See http://www.ec.gc.ca/rhc-wsc/default.asp?lang=En&n=E94719C8-1)

3. What conflicts regarding the use and protection of rivers have arisen?

4. List the resources you used for this section noting which were most useful and why.

5. From the information you gathered, compose two questions you would like to follow up with your class.

8.3 Explain how concepts of resistance and resiliency as demonstrated in a cold climate are central to sustainable management of aquatic and terrestrial resources in the circumpolar North.

1. For each of the following, identify an example and provide a brief description of how they exhibit either resistance or resiliency:

     a.   An animal species and "resistance".

     b.   An animal species and "resiliency".

     c.   A plant species and "resistance".

     d.   A plant species and "resiliency".

     e.   An ecosystem and "resistance".

     f.   An ecosystem and "resiliency".

2. Referring to the animals, plants and ecosystems you have identified, how do resiliency and resistance play a roll in sustainable management?

3. List the resources you used for this section noting which were most useful and why.

4. From the information you gathered, compose two questions you would like to follow up with your class.

8.4 Analyze significant differences in resource management philosophies and practices between government agencies, the private sector and Indigenous organizations in the circumpolar North.

After reading this section, focus on the circumpolar region you have chosen to gather information to explore the following questions.

1. Provide an example for public governance, market resource governance and participatory resource governance in the region you selected. If you cannot find an example, theorize why this might be.

2. Does the region you have selected show a tendency to one type of governance or have governance methods changed over time?

3. Do you find different governance types lend themselves to one resource type better than another (e.g., renewable vs. non-renewable)? Why?

4. What are the significant differences and similarities in resource management philosophies and practices between government agencies, the private sector and Indigenous organizations in the circumpolar North? Complete the table below with your findings.

List the resources you used for this section noting which were most useful and why.

From the information you gathered, compose two questions you would like to follow up with your class.

Similarities	Government Agencies	Private Sector	Indigenous Organizations
Government Agencies			
Private Sector			
Indigenous Organizations			

Differences	Government Agencies	Private Sector	Indigenous Organizations
Government Agencies			
Private Sector			
Indigenous Organizations			

Adapted from BCS100 Module 8. Developed by B. Sagdahl, Bodø University College, Bodø, Norway.

In previous BCS courses (e.g., BCS 100) we discussed challenges to sustaining commonly held resources and the need for restrictions to promote sustainability and prevent resource collapse. Lack of regulation leads to over exploitation and depletion, and can lead to economic collapse. Users compensate for diminishing resources by increasing exploitation and harvesting efforts, leading to over-capitalization and mismatched harvest efforts and economic gains. Therefore, regulations must be introduced to secure economic and ecological sustainability.

Following are three resource management models that rely on different forces to regulate use.

8.4.1 Public Governance

The public governance model, also known as the state management model, is rooted in the political-administrative system and is used to formulate and implement policies that respond to public needs and demands. The state holds authority, is legitimate, makes and abolishes laws, and is responsible for resource management, monitoring and rule adjudication.

Public governance is supposed to play an impartial role when conflicting private interests are involved and have established conflict resolution procedures. Public governance by the rule of law has accountability. The state has authority to use force to implement legally based policies to prevent "tragedy of the commons". The state or public authorities are expected to intervene when individual human action might cause damage to the collective.

Resources can be managed through bilateral and international agreements, whereby the state is the legitimate actor and represents or authorizes representation to develop solutions. The state can own land and control resource use and exploitation. Indigenous peoples sometimes manage vast areas of land in the North, although such land is often controlled by the state as is the case in Nunavut Territory in northern Canada. States also control rights to marine resources, e.g., the Law of the Sea gives nations control of resources within their respective 200 nautical mile Exclusive Economic Zones.

Public resource governance is not without fault. The rule of law can be a lengthy political and administrative process that is not conducive to efficient or effective solutions. The rule of law is often encumbered by bureaucratic rigidity, sector conflicts and coordination challenges, and complex problems often have information and knowledge gaps making the state model inadequate for solving resource conflicts. Political-administrative solutions are formed in political environments and subject to political pressure from stakeholders and user groups, which vary according to political system. Nordic countries are known for their consensus-oriented style, whereas the Russian political system has a more complex governmental structure. Regardless of the political system, state resource management policies can be biased by lobby groups and hold no guarantee for being balanced or impartial. Finally, monitoring and control activities are dependent on public budgets and a state's capacity to deal with monitoring and controlling responsibilities across vast areas of the circumpolar North. Accordingly, public governance is no guarantee for achieving sustainable management.

8.4.2 Market Resource Governance

The market resource model is based on the premise that common resources, despite limited access, should be governed by market mechanisms that provide incentives to harvesters to exploit resources sustainably. The model suggests that given long-term rights, market mechanisms will work to solve the over-capacity problem. The objective of market resource governance is to replace common rights with private rights to create conditions for self-interest, thereby providing incentives for individuals to avoid ecological or economic collapse. Proponents of this model argue that administrative costs are reduced and private interests incur costs simultaneously with private benefits.

Such arguments have been used to privatize fisheries, which have traditionally been common or open access resources. Private rights are governed by trade and licenses, and quotas for vessels and catch amount. While theoretically this model works, there have been cases as in Iceland where the result was fewer participants, bigger vessels

and centralization. Fishing communities lost the right to land fish catches and vessels' rights and quotas became commodities where the strongest bidders secured the majority of fishing rights.

Market models are not designed to perpetuate existing living or social conditions. Instead, market models focus on profit maximization and efficiency, aspects of the market model often deemed unfair. While the market model often creates new structures and business arrangements, it is also often accompanied by unemployment and displacement for less efficient producers. Recruitment of new actors depends on financial capacity, rather than social standing and community belonging.

Theoretically, the market resource model states that a private interest will use a resource in a way that maximizes the stream of benefits over time and therefore has an interest in acting responsibly. Similarly, if a private interest wants short-term gains, they possess the right to sell, and have a strong incentive to maintain the value of the resource. However, there is no guarantee that the incentive to maintain the value of the resource will be maintained. Profits are shorter term than ecological benefits, which are not always easily traceable.

Turning common pool resources into transferable market rights is complicated and raises the problem of determining who receives initial rights and the cost of such rights, e.g., licensing. The market governance model also favours large industrial actors for whom profit maximization and efficiency is the driving force. Large operators can achieve economies of scale and under these circumstances natural monopolies can form. Therefore, it is essential to carefully monitor the transition from common pool to private resources.

8.4.3 Participatory Resource Governance

Restrictions on access and exploitation of scarce natural resources lead to situations where rules and decisions are questioned and challenged by affected parties. For example, is the allocation fair? Has all the available information been considered? These questions were asked in northern Norway when from 1987 to 1990 coastal fishermen and communities experienced a significant cut in cod quotas. Protests included local councils, clergymen and churches whom mobilized to bring about a policy favouring coastal fisheries and communities. People questioned the legitimacy of the policy and challenged the decision-making system.

A way to reduce tension and increase the legitimacy of a political process is to include stakeholders from policy formation to implementation. This approach known as participatory government or **co-management** utilizes decisions based on western scientific knowledge and traditional knowledge. Co-management can increase the legitimacy of resource policy formation and management because greater consideration is given to local communities, indigenous rights and specific concerns. This organizational model is seen as an alternative to market rule and is desirable where discourse among participants is preferred.

The participatory government model is based on the state's authority to rule and make legally binding decisions. The state remains the main actor but chooses to cooperate with affected parties in an organized manner, providing information and legitimacy to the policy process and its outcomes. Participatory government provides great variations in the degree of delegation of authority to lower government levels and participatory

bodies, yet the state is ultimately responsible and science-based information is the base of the knowledge platform.

Participatory government is largely dependent on domestic political cultures that vary by state and are influenced by cooperating parties. Co-management regimes tend to favour long-term rationality, fair distribution and increased legitimacy. However, the effectiveness of this model depends on how well stakeholders and user groups are balanced, the extent to which advice is taken and the degree to which parties are pursuing similar objectives. Ultimately, the choice of the model is a question of politics and the state of the resource.

8.5 International Management of Aquatic and Terrestrial Resources Spanning National Borders

After reading this section, explore the following questions in the context of the circumpolar North.

1. Identify two cases of international aquatic resource management.

    a. Did they succeed or fail?

    b. Based on your findings, why did these succeed or fail? How did the approaches differ?

2. Identify two cases of international terrestrial resource management.

    a. Did they succeed or fail?

    b. Based on your findings, why did these succeed or fail? How did the approaches differ?

3. What lessons can be learned from past failures and successes to apply to future international natural resource management?

4. List the resources you used for this section noting which were most useful and why.

5. From the information you gathered, compose two questions you would like to follow up with your class.

Adapted from BCS 100 Module 8. Developed by B. Sagdahl, Bodø University College, Bodø, Norway.

International cooperation is important for sustainable resource development because resources are often shared by nations. Many ecological systems span national borders and many resources do not belong to any nation, e.g., the world's fisheries. International fishing vessels are often registered in remote states with no quota rights and for years have fished in northern international waters beyond national control and where bilateral treaties do not exist. Open access to fish stocks has led to significant depletion and sometimes extinction. During the last decade, growing pressure on northern fish stocks has been driven by globalization and decreases in transportation costs. To address overfishing it became important to secure property rights and move from open access to public ownership leading northern nation states to establish exclusive economic zones by extending jurisdiction of adjacent sea areas from 4 to 200 nautical miles as per the Law of the Sea.

The fishing example illustrates the "tragedy of the commons" and the importance of secure property rights and **adaptive management** in sustaining resources while pursing responsible resource development. Also important is the requirement for international cooperation and agreement for developing solutions through international law and conventions headed by the United Nations. As a result, while most of the world's fish stocks are being overexploited, fish stocks in the Barents Sea, for example, are being managed sustainably as a direct result of international and bi-lateral cooperation.

Resource **stewardship** is integral to environmental policy making and economic development, and is an international issue requiring coordinated action across world communities. Many problems have to be addressed at the international level and cannot be solved nationally or bilaterally. The United Nations (UN) has been an important institution for recognizing environmental challenges and its policy-making role promoting sustainable development.

The first UN conference on this issue was held in Stockholm, Sweden in 1972, leading to the World Commission on Environment and Development headed by the Norwegian Minister for Environmental Affairs, Gro Harlem Brundtland. The work of this committee, referred to as the "Brundtland Commission", submitted the final report "Our Common Future" in 1987 suggesting environmental issues be targeted by the world community. This work was followed at the 1992 Rio Conference, the United Nations Conference on Environment and Development (UNCED), resulting in the Rio Declaration on Environment and Development, Guiding Principles for Management of Forests, Agenda 21, and two important international conventions on climate and world biodiversity.

The Rio meeting represented a major step forward in setting the world's environmental agenda and contributed important approaches to safeguard sustainable environmental development and use of natural resources. The Rio Declaration espoused sustainable natural resource development, avoidance of environmental damage and the use of the **precautionary principle** where scientific knowledge was lacking. Signatory states committed to pass domestic laws to protect nature and the environment and to mobilize their citizens to engage in environmental work. The Rio Declaration laid down important principles for further environmental action at the international, national and local levels. Agenda 21 was devoted to protection and stewardship of natural resources. The Convention on Biodiversity committed the signatories to protect, allocate and extract natural resources in sustainable ways. The Climate Convention focused on the need to protect the world's climate, essential for the sustainability of northern ecosystems.

National environmental policies began to flourish in the 1970s in the wake of the UN's work on sustainable development and have grown in importance since the UN meeting in Rio in 1992. Environmental non-governmental organizations (NGOs) emerged as a driving force to pressure public authorities and the international community. NGOs have had a major effect on raising awareness and initiating public debate sometimes resulting in civil disobedience. The necessity of public debate and engagement cannot be understated when it comes to forming and implementing environmental policies of which sustainable resource stewardship is an integral part. Additionally, a free press to criticize and support public authorities and thereby set political agendas is a precondition for public engagement in environmental issues.

Recently, all Arctic Council countries have accepted environmental NGOs who cooperate at international levels thereby changing the balance of political pressure. With the growing number of states ratifying UN conventions, including Arctic states with the exception of the United States, international commitments and national political pressure

have increased to protect, preserve and manage the environment and natural resources in a sustainable way.

Conclusion

Management of aquatic and terrestrial resources and environments is a dynamic and constantly evolving topic. There is no single correct way to effectively manage resources and historical context is important. New methods of management must be explored to address changing political, social and scientific regimes. Through this module, you have developed information gathering skills and resources and networked with classmates to share information and learn from each other.