

Social and economic aspects of climate change in arctic regions

by Hugh Beach

CHAPTERS:

- Philosophical Storms
- Hot issues
- The Negotiation of Nature

Philosophical Storms

Should climatic change become more rapid and drastic than the previous course of evolution has prepared us for as organisms we are threatened, and if the added adaptive flexibility granted our human species through cultural transformation or even desperate scientific survival strategy is insufficient, our cultures, our species and maybe even life on this planet are doomed. Philosophers might convince us that there is neither ultimate failure nor ultimate success in the venture of Mind. The ecological relations of our planet would not desist with the demise of the human population, human cultures or the human mind. But this is little consolation. It is entirely natural and necessary for our own survival that we try to look after our own human interests in this ongoing struggle or beautiful Dance of Life. However, should human purposiveness and human survival success become too dominant in the ecological system of the Whole, the whole of the current system is threatened and thereby also ourselves as part of it.

While this is the dilemma of all life forms within the greater life of Mother Earth, the human species today has attained a special expression of what might be called this Mixed Blessing. The remarkably accelerating impact of humankind upon the biosphere steers us toward increasing ease of self-fulfilling prophecy with respect to it, and, as pointed out by Gregory Bateson 30 years ago, our ideas about ecology become part of the ecological problem. In effect, our own ecological precepts become manifest to a degree never attainable by pre-industrialized tribal peoples, though maybe imagined by indigenous cosmologies.

Thus our ideas concerning not only the ecological science of modern western man, but also concerning the ecological understanding of indigenous peoples are crucial to the survival venture. The modern-day researcher might smile wryly at the thought that the animal spirits and shamanic personages of indigenous cosmologies have upheld the World Order, secured the rising of the sun and kept the stars aligned. And yet, the very fact that these cosmologies have not tipped the balance of systemic wholeness so effectively toward

human success has indeed promoted human continuity and spared us many of the serious problems facing humanity today. Of course it is useful for any scientist with a purposive mission to respect the traditional knowledge of indigenous peoples. Indigenous scientists of the hunt possess generations of practical experience and intimate knowledge of their habitat and their prey. But the mere facile appendage of indigenous data onto the scientific repertoire fails fundamentally to embrace the essence of indigenous knowledge. Indigenous knowledge comprises far more than ineffectual cosmologies, unknowingly non-harmful cosmologies, or detailed environmental observations; it often contains as well deep understanding of the balance required by humankind to maintain a place in Nature. Most importantly, it also forces upon us a purposiveness perspective other than our own, one dedicated to indigenous survival even if unified with us on the general humanitarian level.

Hot issues

Human populations of the Arctic have evolved both physically and culturally in relation to extreme climatic conditions. To the peoples living in the North, normal seasonal variation has always been considerable, commonly demanding or enabling routine changes of settlement area, social grouping, house form, subsistence activity, mode of transportation, and diet.

It is a difficult balance to weigh risks of diminishing certainty with appropriate action and concern so as to make a meaningful and positive difference. Currently most predictions on climate change keep to a 50-100 year frame. Within this time span, climatic change may not be so great as to overwhelm the temperature extremes between natural, annual seasonal fluctuations, but it will surely shift, stretch or compress the seasons considerably, to bring about spiraling accumulative changes such as in the thawing of permafrost, northward shift of biotope zones, and radical alterations of ice formation. These changes in turn will greatly effect breeding patterns and migratory behavior of species central to indigenous livelihoods and cultural traditions. While I habitually address indigenous issues, much of what I say here applies equally to non-indigenous Arctic residents.

Arctic ecological subsystems can be usefully categorized according to a tripartite division: marine, freshwater and terrestrial. All of these share the feature that they are relatively young, since only approximately 10,000 years have passed since the retreat of the continental ice sheets. Relatively few species have had the time to adapt to life in the Arctic, but the members of these few species can

be in great supply, forming a so called specialized ecosystem. Besides the youth of the Arctic ecosystem, its soil is relatively infertile, precipitation low, growing season short, and wind speed high. As the vegetation is quite uniform, there is also low diversity of animal habitats, and because of its low biological diversity, the Arctic ecosystem can be quite unstable, being in short supply of the checks and balances provided by the systemic integration of many species. Particularly in the terrestrial subsystem this is evident in the widely fluctuating population levels of dominant species.

Marine mammals: whales, walrus, polar bear and seals of various species, are major elements of the marine ecosystem and of major importance to human subsistence and cultural maintenance. Although the polar seas can team with large standing crops of certain species at certain seasons, this is by no means a general or constant condition. High productivity is actually more common in the subpolar seas or where waters from different sources merge and cause the upwelling of nutrients. Moreover, the life which seems abundant is largely composed of seasonal migrants to specific feeding grounds where food production can be intense but short. This implies, for example, that even if climate change does not cause the reduction of the world's stock of ringed seals, it might indeed cause them to migrate in new paths, thereby dramatically affecting subsistence harvesting and hence human settlement patterns.

Food chains are also short. Growth and rates of reproduction for most species are low. Species abundance is not solely regulated by abundance or scarcity further down the feeding chain, however. The population density of breeding seals, for example, is positively correlated with the distribution and condition of coastal sea ice. Inuit hunters know the usual types of ice formation at different places and therefore know where seal breathing holes are most likely to be found. Inuit hunting strategies are the result of the interplay of complex variables such as the distribution of numerous game species, dietary needs, transportation possibilities, and energy expenditures of different hunting forms. The separate and combined effects of the warming of land and water temperatures along different scales as well as changes in precipitation will most assuredly effect ice formation and thereby both the distribution and breeding of game animals. This in turn may cause current settlement locations, originally determined solely by subsistence criteria but often later endowed with an imported infrastructure, to be misplaced--or rather, their viability will be increasingly dependent upon externally derived funds, services and employment instead of the harvesting of subsistence resources.

Especially for the northern peoples of Fennoscandia and the Eurasian continent, fish, notably salmon and char, are dietary staples, mainly in the summer months. Even in North America, freshwater fishing is by no means insignificant. Freeman mentions that there are about 60 species of freshwater Arctic fish, although only about 10 of these are utilized by man. Rivers generally provide the best nutrient base for fish and therefore estuaries and deltas prove most attractive to fish predators. Humans are attracted to these areas for the fish, for the accompanying wildfowl, and for the fur provided by the furbearers drawn to the same areas.

Obviously increased precipitation and CO₂ concentrations with global warming will affect vegetation growth (type and spread) and the composition and reach of forests. With an average projected temperature increase of 10-60 times as fast as that which has occurred from the end of the last Ice Age to the present, some scientists predict a state of non-equilibrium between the atmosphere and other highly determinative climatic variables. For example, the deep oceans will warm at a rate much slower than that of the surface water, and forests will spread north at rates which lag far behind what the rate of widening habitat due to warming would make possible. It is also quite possible that a number of feedback spirals will be created. For example temperature rise affects a considerable decrease in global ice coverage which will cause greater heat exchange between ocean and atmosphere, causing even less ice formation, etc. Moreover, less ice means better ocean-going transportation possibilities for longer periods and probably increased oil and gas exploration and eventual exploitation. The expected 15-95 cm rise of the sea level during the next 100 years can displace vast numbers of people to the south and can also render many Arctic settlements uninhabitable. Land erosion will also increase dramatically with the rise of the sea level. Seasonal shifts, precipitation, ice quantity and quality, and snow conditions are but some of the variables that will surely affect the means of northern transportation, hence hunting strategies and settlement.

With regard to the terrestrial subsystem, snow cover is of utmost importance both to vegetative cover, but also to the herbivores (reindeer/caribou, moose, musk-ox) dependent upon grazing resources. Winter snowfall is a main source of water to plants, but if snows are too deep or too crusted the access of herbivores to their necessary grazing resource is cut off, resulting in mass starvation. Should periods of cold weather alternate with periods of mild weather, ice can form on plants so as to make them useless for grazing animals. The wild reindeer of Eurasia or caribou of North America have been essential to the survival of many northern

hunters. In Fennoscandia and Eurasia domestic reindeer herding is a major livelihood among indigenous pastoralists, an important food resource, source of employment, and a foundation of their cultural heritage. Changes to the reindeer herding livelihood occasioned by increased precipitation and warmth are difficult to foresee.

However, it must be noted that northern lands are far from the unexploited wildernesses that many believe them to be. The herding livelihood is in serious competition for land resources with a number of exploitive industries, for example hydro-electric power, mining, and timber. Were vegetative conditions to alter so that reindeer ranges could expand or have a greater carrying capacity, this does not at all mean that the herding livelihood will expand.

Degradation of permafrost, and thermokarst erosion will affect surface water runoff and introduce more nutrients into the soil. Warmer soils will lead to greater decomposition of organic matter, more nutrients for plants, therefore population increases and migratory shifts of grazing herbivores hunted or herded by indigenous peoples.

Wage employment is vital to most northern dwellers, indigenous and non-indigenous, and many impacts on urban markets even far to the south will certainly effect people in the North. Few northern communities are isolated from modern industrial centers, and a good number of them are grossly dependent upon government subsidies and programs. Should one follow all the possible repercussions of climatic change, few if any aspects of life would not be impacted in some way or other. Northern social impact ricocheting off altered climatic determinants of southern populations may be great, especially and maybe hopefully with respect to the attention directed to the north by well-endowed research. The mesh of causal loops is wonderfully intricate, making our ability to predict the repercussions of variable change hopelessly crude. If we are to reverse negative trends or even to react to them in the best way, it is essential to grasp the causal paths binding human behavior (such as pollution emissions) with climatic effects and how these loop back to human impacts. Unfortunately it is often only once we have suffered the negative impact that we see the arcs of our actions turn into loops.

The Negotiation of Nature

While it is popular to assume that ecology is a nonpartisan scientific discipline, deeper reflection forces us to recognize that when linked to any form of advocacy, such as what is ecologically desirable, it is not and can inherently never stand free from politics.

To exemplify: Among the most controversial issues for Saami today are 1) the existential status of predator populations at the expense of the reindeer herding livelihood 2) the claim that too many Saami reindeer are transforming the Swedish mountains into a rocky desert 3) the battle over small game hunting and the confiscation of the Saami exclusive hunting right 4) the contested Saami right of traditional usage to graze reindeer east of the Agriculture Line 5) the increasing use of "high-tech" equipment (snowmobiles, helicopters and now motorbikes) in the practice of reindeer herding, and 6) the growing pressures to widen the membership of the herding collectives to include non-herding Saami. Obviously each of these issues has direct economical bearing on Saami livelihoods and, through them, bearing on Saami culture. The entrance of Sweden into EU is also a matter of utmost significance for the Saami, as it imposes yet another layer of higher-order regulation far removed from the local context. The limited self-determination which the Saami have still been able to maintain regionally in a livelihood legally confined to them is now under threat, not as before from the competition of farmers and settlers, or by the rationalization programs of the welfare State, but rather from the appropriation into global concerns.

Certainly, in the examples above, resource conflict is a central issue. Yet parallel to the aspect of resource as material good is the aspect of resources as cultural and ethnic domain. Do the reindeer utilize Saami grazing or Swedish grazing? Are the mountain regions a Swedish or a Saami landscape? Most importantly, is the Saami core area and base for Saami livelihoods to be appropriated under the management forms of Swedish ecology imbued with the agreements of international declarations? Or is there room for Saami self-maintenance and self-development, that is, ecological goals dedicated to the sustainable development of the reindeer-herding population and Saami society? Will the international conventions and institutions devised to protect the environment, frequently armed with lowest-common-denominator admonitions and without enforcement agencies, provide better protection than that of traditional local users or individual states?

The formulation of such questions is preconditioned by an awareness of the unavoidable political dimension of ecology in practice. Goals of "sustainable development" beg the questions what is to be sustained and for whom. There are an infinite number of long-term sustainable ecosystems that can be promoted in a given region; which, is a political question. What can be termed "vulgar ecology" tends to cloak the role of human purpose in conceptions of Nature. It is a perspective readily revealed by the reductionistic, monetary metaphors it employs; one should live on

the "interest" and not deplete the "capital" of natural resources. Supposedly, if one follows this rule of thumb, Nature (or whatever eco-system has been targeted by human purposiveness, for example "wetlands") will be sustained. However, in the monetary metaphor, even if amounts of it change, money is a constant. One is either sustaining it, increasing it or depleting it. Eco-systems do not work this way. In whatever way they are being utilized and to whatever degree, they also thereby alter character (not just quantity).

It is my contention that indigenous peoples can be regarded as weather vanes for the rest of humanity with respect to the effects of climate change. So good are the strong at buffering themselves from the feedback of their own short-sighted policies at the expense of the weak, that many of the future world's worst global dilemmas will surface first among the native minorities. It would be irresponsible to overlook political realities when assessing ecological "winners and losers" of climate change. Not only might climate change destroy much of the cultural continuity and practical livelihoods of northern indigenous peoples, the possible new opportunities it might afford may be largely lost to them. Should, for example, global warming make feasible the cultivation and harvesting of resources new to the north, the proceeds from this venture would most likely come to benefit primarily members of the majority populations.

It is only relatively recently and in a few specific areas that, through the process of comprehensive settlement claims, the rights of northern indigenous peoples have been recognized by their encompassing Nation-States as including land ownership and various degrees of self-government. The Greenlanders have been granted Home Rule by Denmark, and the Alaska Native Claims Settlement Act of 1971 has established 12 regional land owning corporations. In Canada the Inuvialuit Final Agreement in the Northwest Territories and the Nunavut settlement in the eastern Arctic are examples of major native land settlements. However, throughout most of the Arctic regions indigenous peoples do not possess the ultimate control over resource exploitation. Commonly they are seen to enjoy only usufruct rights of land use, based upon their traditional use. For example, the Saami in Sweden have alone been granted the privilege to herd reindeer on Crown lands, but they would certainly not be given the same right to herd sheep there. Indigenous peoples with mere usufruct rights can hardly stand in the way of exploitation condoned or instigated by a self-professed land owning Nation-State. Were the climate to change so as to demand or make possible new forms of livelihood for northern indigenous peoples, the new livelihoods would not entail the legal or

moral justifications for Native monopoly of resource access enjoyed by many Natives today. Also international conventions ratified by many of the northern nations protect Native resource utilization as an essential element for indigenous cultural maintenance. Even apart from the added problems of climate change, the pressures of modernization and rationalization which bring about such practices as reindeer herding by helicopter already try the patience of majority peoples who have been denied resource access on the grounds that it is necessary for the preservation of Native traditions.

Because of the many bitter conflicts between northern indigenous peoples and their encompassing governments over natural resources (hydro-electric power, timber, mining, hunting and fishing, tourism, and animal protection), local indigenous peoples are not necessarily prone to look kindly upon Nation-State environmental protection efforts. Instead, and with good cause, they often view government environmental policies and constraints as yet another layer of colonialism, another means of blocking indigenous self-determination, again with the so-often-heard refrain in the wake of government-condoned massive environmental destruction benefiting powerful urban-based money interests that the new regulations are for "their own good."

If humankind is to confront the dangers of climate change, the knowledge how best to do so and the technology to effectuate this knowledge are not enough. Western scientists, products of industrialized Nation-States, must establish a fundamental integrity with indigenous peoples and bring them as co-partners into this essentially human enterprise. Otherwise there is the very real risk that the "cure" will be regarded by them as worse than the disease and as another colonial ploy, stripping them of self-determination and disrespectful of their indigenous knowledge.

While the impacts of various forms of pollution over the past years have had demonstrated negative effects on indigenous health and the maintenance of indigenous livelihoods, the effects of climate change are far more subtle, and what human agency there might be is far less recognizable amidst the myriad of other long-term cyclic climatic trends. With respect to dramatic impact on indigenous lives, direct human-made impacts of pollution, legislation and competitive exploitation of lands are the most pressing. This is not new. What is new is the justification often given by majority legislators and the public media for legislative changes regulating indigenous resource use. While those indigenous peoples who have been bereft of their lands and stripped of their special resource rights are frequently portrayed as romantic ecological gurus, those maintaining some

form of special resource access are all too often labeled eco-criminals. Over grazed ranges, decreased game stocks and the decrease of protected predatory species are habitually and solely laid at the door of indigenous land users.