Ángel Gómez de Ágreda
Liutenant colonel, Spanish Airforce. PhD Candidate in International Law, José Ortega y Gasset Institute, Universidad Complutense de Madrid.

- Submited: December 2013
- Accepted: March 2014

CLIMATE CHANGE IN THE ARCTIC: BEYOND THE NORTH POLE

Climate change is a global phenomenon the effects of which will be felt in different ways in every corner of the planet. Numerous papers and studies have described more or less the possible consequences of global warming at local level. However, changes which take place in such a specific environment as the Arctic will also reverberate well beyond the Polar Arctic Circle. The navigability of polar routes, for instance, could allow access to the ample and rich tracts of land of Siberia through river systems heretofore obstructed by ice.

In order to grasp the true scope of changes ahead it is necessary to conduct a dynamic study of all the factors involved. A sequential view of local scenarios will not suffice. In any event, we will have to get used to a more spherical and less cylindrical view of the world, which alienates the Polar Regions by regarding them as impassable.

Climate change, Arctic, Siberia, geopolitics, routes, energy, resources.

CLIMATE CHANGE IN THE ARCTIC: BEYOND THE NORTH POLE

1. A GLOBAL PHENOMENON

A significant percentage of the documents dealing with the study of the effects of climate change on the Arctic limit their scope to its consequences north of the Polar Circle. The globalisation of the environmental phenomenon should, however, oblige scientists to evaluate the ramifications that extend beyond the confines of the polar zone and include distant and distinct[1] geographical areas that will also be affected positively or negatively as a result[2].

One of the principal distorsionary elements influencing our perception of the reality of climate change is the observation of its effects from an excessively local perspective or one that is centred on very concrete aspects or periods of time. This tendency is, moreover, not always blameless. In many cases it stems from a desire to emphasise concrete aspects in support of arguments from interested parties, be they deniers of the environmental reality[3] or excessively alarmist with regard to its real consequences and scope.

Not surprisingly, the real answer lies somewhere in the middle ground between the two extremes. In effect, climate change is precisely that: a change. Any attempt at dramatising (or playing down) this fact derives from an insufficient understanding of the phenomenon or the desire to politically exploit data and statistics presented partially[4].

1 The effects will be felt worldwide, including in Spain. A study on the subject can be found in "The Arctic and the effects of climate change in Spain" Greenpeace, March 2013

2 Hence the growing interest in countries far distant from the North Pole in participating in the debates of the Arctic Council, See inter alia, WILSON, Page, "Asia eyes the Arctic", The Diplomat, 26 August 2013. http://thediplomat.com/2013/08/asia-eyes-the-arctic/. Also PALACIÁN, Blanca y GARCÍA SÁNCHEZ, Ignacio, "Geopolítica de deshielo en el Ártico", Estudios de Política Exterior, Política Exterior number 154. http://www.politicaexterior.com/articulo?id=5193

3 FARRELL, Paul B., "The 10 dumbest things climate-change deniers say", The Wall Street Journal, Market Watch, 20 November 2013. http://www.marketwatch.com/story/the-10-dumbest-things-climate-change-deniers-say-2013-11-20?mod=wsj_share_tweet

4 Of considerable interest is the study of the application of International Law to the changing Arctic reality. Consult also the bilibliographic compilation of CONDE PEREZ, Elena in "Arctic

The change that we are referring to implies s*imply* a displacement of climatic conditions according to a multitude of factors. Nothing is created or destroyed, but rather a transformation is taking place of the specific circumstances of each zone or region. What is relevant in the phenomenon of climate change is precisely that variation, which will bring about the need for the vegetal and animal species to adapt to the new scenarios; and obviously human beings also, both as individuals and as a social group.

The fact that the change relates to a global factor such as climate describes the very essence of the change (global in its literal sense, meaning that it takes in the whole extension of our earthly globe). Nevertheless, that same globality of change requires that it be studied in the system as a whole, and not just in a specific region, or confined to a single aspect of this global phenomenon.

The importance of this horizontal (in terms of its geographical extension) and vertical (with regard to the associated phenomenona) vision of the whole becomes evident when it comes to identifying the risks which human activity will be subject to –directly or indirectly– and discovering the opportunities that the transformation of current parameters presents worldwide.

The inability to disassociate phenomenona and geographical zones could lead to partial viewpoints that will tend to be excessively optimistic or pessimistic, and, in any case, insufficiently grounded in reality. Such targeted studies may well bring about the identification of concrete circumstances that will affect a specific zone or group of regions that will be affected by a given phenomenon; but they will always be insufficient in deciding which will be the most effective lines of activity in order to mitigate such effects and in identifying the opportunities that will gradually appear as meteorological variables begin to modify.

It is necessary to analyse reality in its changing environment if we are aiming to achieve a realistic, or, at least, plausible image of the future, so it is not possible for us to keep variables fixed in order to test the evolution of the rest. This dynamic analysis may give rise to an apparently disjointed discourse on account of the overlap of considerations, but, like in an impressionist painting, the vision of all the points in their entirety should allow us distinguish the images being traced.

The direct effects of climate change on the Arctic ice floe are, probably, those with the greatest impact at local level. They are also the ones that will bring about the greatest consequences on a universal scale. Many of these variations are looked upon by humans as adverse to their interests, others consider them to be an advantage and others will infer repercussions yet to be revealed. In all cases, however, these are merely

Region", Oxford Bibliographies, 24 July 2013. http://www.oxfordbibliographies.com/view/document/obo-9780199796953/obo-9780199796953-0090.xml?rskey=k1k4Ox&result=5&q

perceived views, value judgements and evaluations of the costs and benefits from a specific point of view. The planet as such has suffered similar alterations –albeit probably with quite different causes and evolutionary rhythms– with no other consequence than the need for its settlers to adapt to the new conditions. If at local level *one cannot please all of the people all of the time*, it is also true that neither at global level would climatic variations be looked upon equally by the entire international community.

There has been a multitude of studies on the local effects of global warming within the confines of the Arctic Circle. Here we aim to analyse some of the external areas that will also be affected by the polar thaw. As suggested before, even those circumstances that may be perceived as beneficial or prejudicial at local level may turn out to have the opposite strategic or geopolitical -or at least very different- consequences to these perceptions. Far beyond adopting specific measures to mitigate the clearly damaging effects, it will become necessary in coming decades to develop an unprecedented capacity of adaptation[5].

It is very probable, on the other hand, that the lessons learnt from the management of events taking place in the Arctic could be applied to other "vacant spaces"[6], even at the other side of the world[7].

2. THE GEOPOLITICS OF THE EURASIAN CONTINENT

In his book "The Vengeance of Geography"[8], Robert Kaplan, chief geopolitical analyst of the US think-tank Stratfor, brilliantly illustrates the importance of lines of communication in the development of empires and nations. The idea is not new but Kaplan's approach provides us with a different and fresh perspective .

The importance of geographical factors is something we have known from time immemorial. Human settlers have always preferred to settle along river banks with

5 No less important will be the implications of thawing on International Law and its interpretation by the latter. On this subject see ORESHENKOV, Alexander, "Arctic Diplomacy", Russia in Global Affairs number 4, December 2009. http://eng.globalaffairs.ru/number/n_14250

6 GÓMEZ DE ÁGREDA, Ángel, "Geopolítica de los espacios vacíos", Revista Ejército, special December edition 2010.

7 SMITH, Andrew;"Arctic and Antarctic strategy: poles apart?", The Strategist, 2 December 2013. http://www.aspistrategist.org.au/arctic-and-antarctic-strategy-poles-apart/

8 http://www.stratfor.com/revenge?0=ip_login_no_cache%3Dd6e70407cfe94c3fb823b34d16a3a6a6

guaranteed access to drinking water and efficient means of communication along their banks to harness the energy provided by the fluvial currents. We have learnt from historical records that it was precisely in the proximities of the mouths of great rivers that some of the earliest cultures prospered. In this sense, the Nile was considered the father of the Egyptian Empire; Mesopotamia owes its name to its location between the great rivers of the Middle East, and China, the Empire of the Centre, built its nucleus basically between the lower courses of the Yang-Tsé and the Yellow rivers.

The importance of internal connections

An analysis of the US think-tank Stratfor on the inevitability of the American Empire[9] starts from the premise that the competitive advantage achieved through its excellent fluvial and maritime communications confers on the United States the possibility of exploiting its resources more efficiently, and therefore trading with them from a position of pre-eminence. The basin of the river Mississippi and the rest of the intercostal waters of the US Atlantic coast constitute the largest network of navigable waterways in the world, that permit the reduction of operation and transport costs to a marginal fraction in comparison with their competitors[10].

Other relatively modern examples can be seen in the Rhein-Ruhr basin, in Germany. The concentration of industrial activity along the banks of both rivers and their tributaries is by far the greatest in Europe, a circumstance that appears to justify the thesis that awards major importance to rivers in the economic development of regions and their socio-political integration.

Even so, not all rivers are –nor have they been- adequately utilised in this way. There are other circumstances that come into play and influence the degree to which waterways can be harnessed. One of the most important is undoubtedly the location of the mouth of the river current and its connectivity with distant markets. To give an example: the importance of the great Russian river in the European zone, the Volga, is substantially moderated by the fact that it flows towards the Caspian, an inland sea that provides scarcely any access to international markets.

Until now the other great Russian rivers the Obi, the Yenisei, the Lena, and the Kolyma all, to a lesser extent, had similar constraints. All of them flow northwards and their basins cover a large part of the Siberian region, richly endowed in terms of the existence of natural resources. Nevertheless, various circumstances have impeded

9 http://www.stratfor.com/analysis/geopolitics-united-states-part-1-inevitable-empire y http://www.stratfor.com/ analysis/geopolitics-united-states-part-2-american-identity-and-threats-tomorrow

10 http://www.stratfor.com/sites/default/files/main/images/US_transport_costs.jpg

these river basins from becoming the backbone of the regional economy and, probably, from becoming one of the geopolitical poles in the world. The fact that their lower courses are innavigable as they are covered with ice and flow into an ocean heretofore difficult to transit are the most notable of these characteristics.

Crossing the "Heartland"

Situated in the same centre dubbed by Sir Halford John Mackinder as the "Heartland"[11], the Siberian rivers bear out the wisdom of the arguments commented on above. In 1904, the British geographer had already pointed towards the importance of the basins of the Volga and the Yenisei together with the great Central Asian rivers (the Amu Darya and the Syr Darya), and the seas into which they drain, the Caspian and the Aral (which has almost disappeared through over-exploitation of the waters from its tributaries).

Mackinder puts forward the argument that the *pivot*, as he dubs the "Heartland", is "all but impregnable to attacks by sea powers, yet was able to sustain large populations itself", isolated as it is by the eternally frozen North. For the same reason, the nations "that arose from within it depended on horse and camel to negotiate its vast expanses,

,…"[12]. In fact, the author never once contemplated the viability of the use of these waterways as internal lines of communication and gateways towards international markets.

If we take into account the fact that Mackinder's theories had a decisive influence on the bulk of thinkers and leading political decision-makers of the last century (from Spykman to Brzezinski), a substantial change in the premises on which they were based would have meant a substantive alteration in the consequences that derive from them. Mackinder proclaimed the consequences of the domination of the "Heartland" over the rest of the world in his famous "Who rules East Europe commands the Heartland; who rules the Heartland commands the World-Island; who rules the World-Island controls the world." The global importance of what happens in this region thus alters the focus when it comes to determining the consequences to be drawn from any alterations to its geography.

11 Mackinder, H.J. "The geographical pivot of history". The Geographical Journal, 1904.available at : http://intersci.ss.uci.edu/wiki/eBooks/Articles/1904%20HEARTLAND%20THEORY%20HALFORD%20MACKINDER.pdf

12 MEGORAN, Nick and SHARAPOVA, Sevara, "Mackinder's 'Heartland': A help or hindrance in understanding Central Asia's International Relations?",page 12. http://www.ca-c.org/journal/2005-04-eng/02.megprimen.shtml

The great maritime routes

One might think that the mere opening up of the polar navigation routes[13], and in particular the North-eastern Route[14], that makes its way along the Russian Arctic coasts connecting the Atlantic and the Pacific, should be sufficient to ensure the dynamic driving force that these fluvial currents could exert over their respective basins. Nevertheless, other factors are also required in order to benefit from the multiple advantages presented by these rivers.

The importance of such development is indeed difficult to evaluate. Not all analysts are in agreement even on the spin-off that a North-eastern Route itself could generate. Indeed, it is argued that the greatest part of South-South shipping trade will still continue to take place along the Indian Ocean and the use of the Cape of Good Hope route[15], as required. The impact that Arctic thawing could bring about for the regions irrigated by the great Siberian rivers will be closely linked to the general development of the region and the use of the coastal zone as one of the principal axes of world trade.

In the article mentioned in note16, Humpert and Raspotnik argue that out of China's top ten trading partners, only Germany could potentially benefit from shorter and more efficient shipping routes through the Arctic. However, their study does not does not appear to include other relevant factors, such as security of routes and the possible geopolitical changes that could come about in coming years, coinciding with the melting of the Arctic sea ice.

In any case, while it is true that the importation of raw materials to the major Asian manufacturing centres will proceed mainly from regions situated in more meridian latitudes, the foreseeable evolution of Chinese industry –relatively on a par with what happened in Japan some decades ago– towards the production of goods with a higher added value should increase exchanges with zones of greater purchasing power[16], or

13 "Arctic Sea Lanes Likely To Open In Coming Years, Hagel Says En Route To Halifax", RTT News, 22 November 2013. http://www.rttnews.com/2228564/arctic-sea-lanes-likely-to-open-in-coming-years-hagel-says-en-route-to-halifax.aspx?type=cn

14 REINOSO, José, "El cambio climático abre una nueva ruta comercial para China", El País, 12 August 2013. http://sociedad.elpais.com/sociedad/2013/08/12/actualidad/1376323504_756460.html

15 HUMPERT, Malte y RASPOTNIK, Andreas. "China in the 'Great White North'".17 August 2012.Long Posts.http://www.europeangeostrategy.org/2012/08/china-great-white-north/

16 The activity of the main countries of the Far East over the past few months in relation to the Arctic is hardly surprising. In this regard see McBEATH, Jerry, "East Asia and the Arctic: Alaskan and American Perspectives", Centre for International Governance Innovation, December 2013; YOUNG, Kil Park, "Arctic Prospects and Challenges from a Korean Perspective", Centre for International Governance Innovation, December 2013; OHNISHI, Fujio, "The Process of Formulating Japan's

in other words: while resources could be moved largely in the south, the market for finished products would be maintained in the north.

Security of trade routes

Even so, other considerations, such as the vulnerability of the indicated routes to the activities of potential rivals, have to be duly taken into account. On the other hand, access to the resources contained within the confines of the same Siberian river basins –currently difficult to access– could lessen the importance of imported resources proceeding from more distant shores.

At present, disputes over territory and sovereignty in the area of the South China Sea are a constant reminder of the peculiar configuration of the South-eastern Asian waters and the traditional climate of instability that reigns in the area. Although the percentages vary according to specific circumstances, between half and 80% of the raw materials that feed the factories in China, Taiwan, Japan and Korea cross the straits of Malacca, Sonda and Lombok. At its narrowest point the former is scarcely more than two kilometres wide, yet its maritime traffic is several times more intense than that of the Suez or Panama canals.

Nevertheless, the importance of the Indian route is clearly evident from the establishment by the Chinese of what has become to be known as the "String of Pearls", running all along it. This is a series of port installations (initially) of a logistic nature, with the largest of these facilities in the deep-sea ports of Gwadar, in Pakistan, and Kyaoukpyu, in Myanmar[17]. What is unique about the two sites, and what gives them major strategic relevance, is that not only are they situated in key stretches of global seaborne traffic, especially for the transport of hydrocarbons, but they are -or are on their way to becoming- major oil and gas pipeline hubs, providing communication gateways to the interior of the continent.

In the context of this study, the most relevant aspect of the "String of Pearls" is the parallel to be drawn with future sea lanes along the Arctic coasts. And if we continue focusing on the similarities: the ports, communication channels and hubs that can facilitate access to the interior of the continent, are of particular importance; and

Arctic Policy: From Involvement to Engagement", Centre for International Governance Innovation, November 2013 and SUN, Kai, "China and the Arctic: China's interests and participation in the region", Centre for International Governance Innovation, November 2013.

17 RICHARDSON, Michael, "China betting on overland energy-supply lines", The Japan Times, 27 July 2013. http://www.japantimes.co.jp/opinion/2013/07/27/commentary/china-betting-on-overland-energy-supply-lines/#.UfTLWI1M_WY

all the more significant and critical the resources or the markets with which they are communicating[18].

As we shall see further on, in addition to the major role of the coastal communication channels is the importance of those that connect to the interior regions of the Eurasian continent, which to date have had very little access to international markets. The emphasis that is being placed by the superpowers on the development of the "New Silk Route"[19] is just one of many efforts aimed at tapping into the resources of the inland regions of the continent.

In the world of the 21st Century, more so than in previous times, connections are even more important than hubs. The connections made between centres of production and consumption are fundamental; especially now that production offshoring focuses on knowledge and management capability as of prime importance, and transport costs have been reduced to such minimum levels that they represent but a marginal fraction of the final cost of the goods.

All of this implies that the control of transit routes will be the really crucial element. Dominance of the lines of communication is becoming the strategic cornerstone of the policies of all countries involved; as they strive to maintain their activities or to deny access to present or possible future rivals. It is not surprising that the superpowers feel that anything that threatens freedom of movement must constitute their greatest threat.

In the case of the United States, the perception of the development by China of tactics and techniques known as A2/AD[20] (anti-access/area-denial challenge) in the Western Pacific gave rise to the *Air-Sea Battle Concept*[21]; or operations aimed at countering the interdiction capabilities of Chinese missiles and submarines.

China, for it s part, also fears that the Americans could curtail or limit their access to international routes. The concept of the "chains of islands"[22], archipelagos

18 For a greater understanding of the present-day reality of the Indian region we strongly recommend close reading of KAPLAN, Robert, "Monsoon. The Indian Ocean and the future of American Power", Ed. El hombre del tres, ISBN 9788494016158.

19 For a recent commentary on the above, see IMAS, Eugene, "The new Silk Road to nowhere", The Diplomat, 18 December 2013, http://thediplomat.com/2013/12/the-new-silk-road-to-nowhere/

20 FREIER, Nathan, "The emerging Anti-Access/Area-Denial Challenge", Center for Strategic and International Studies (CSIS), 17 May 2012. http://csis.org/publication/emerging-anti-accessarea-denial-challenge

21 GÓMEZ DE ÁGREDA, Ángel, "Air-Sea Battle concept", Revista de Aeronáutica y Astronáutica, October 2010. A non-classified version of the original concept can be consulted on the web-page:http://www.defense.gov/pubs/ASB-ConceptImplementation-Summary-May-2013.pdf

22 GÓMEZ DE ÁGREDA, Ángel, "Proyección geoestratégica de la Marina china", Revista General

dominated by rival powers surrounding the Chinese coast and that condition its access to the Indian and Pacific Oceans is all too noticeable in recent events in the East China Sea[23] and the South China Sea[24].

The circumpolar routes – and in due course the transpolar routes- will call for a reinterpretation of existing maps. In our navigation charts, the Arctic always appears –when it does– as a marginal region. In the future, and for the first time in history, we will have to take into account the most northerly latitudes, as they will have to be included as commercial routes. But also in order to provide the services and the security that these new spaces are going to require.

Connection inland… and its consequences

It is clear therefore from what has gone before, that there will be a relevant role for the Arctic routes in the future, in spite of the increases in South-South trade. It is also evident that the opening up of these routes will bring about a much more spherical vision of the planet that the one presented in today's navigation charts, once the Arctic region is open to the traffic of goods, which will present its own risks and threats. Finally, extrapolating from the evolution of the of routes crossing the extreme south of the Eurasian continent, we can draw the conclusion that the emerging navigability of the maritime routes will encourage the setting up of secondary networks linking the inland of the continent with the ports that will be established on the coastline.

While it is probable that a similar evolution could take place on the American continent[25], the different level of development in Siberia compared with that of Canada and Alaska, combined with the opening in the foreseeable future of the North-eastern Route which will facilitate the North-western Passage between the

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de Marina,December 2010.

23 At the time of writing this paper, the setting up of an Air Defence Identification Zone (ADIZ) by China was the latest step in the escalation of tension over the sovereignty of the Senkaku/Diaoyu Islands. More in HISLOP, Roxanne, "China and Japan's dispute over the Senkaku/Diaoyu Islands", e-International Relations, 16 December 2013. http://www.e-ir.info/2013/12/16/china-and-japans-dispute-over-the-senkakudiaoyu-islands/

24 RAINE, Sarah y LE MIERE, Christian, "Regional disorder. The South China Sea disputes", the International Institute for Strategic Studies, 2013, ISBN 978-0-415-70262-1.See also BENTLEY, Scott, "China's claim and strategic intent in the South China Sea" in http://southeastasiansea.wordpress.com/2013/11/18/chinas-claims-and-strategic-intent-in-the-south-china-sea-part-1/

25 The United States also has its own strategy for the Arctic. See PARRISH, Karen; "Hagel Announces DOD's Arctic Strategy", U.S. Department of Defense web page, 22 November 2013. http://www.defense.gov/news/newsarticle.aspx?id=121220

Canadian archipelagos lead us to focus on the consequences that the Arctic thaw will have on the Russian Federation[26] and their continental neighbours.

Thus, in spite of the interest expressed by the then President of the Russian Federation, Dimitri Medvedev, in repopulating the Arctic[27], there still remain certain conditioning factors that significantly complicate that desire becoming reality. The reduced –and declining– Russian population is the most important here. Indeed, since the break-up of the former Soviet Union Russia has lost around 10% of its population. In addition to such numerical data, one must mention the existence of a growing proportion of Russians from the ethnic and religious minorities of the south of the country. Quite significant too is the number of Central Asian emigrants that live in Federation territory.

Both Medvedev's speech, and one in similar vein pronounced by Vladimir Putin in the International Forum *The Arctic: Territory of Dialogue*[a] clearly display a concern for environmental aspects and for the preservation of the rights of the indigenous peoples. The Arctic is generally treated as a special case in such matters on account of its uniqueness and its own peculiar characteristics.

Less attention, however, has been given to the parallel development of the regions of the interior that would be connected to the new coastal communications hubs. The geopolitical implications arising from such development would probably be of lesser consequence and importance in international terms.

Indeed since the eighties, in spite of calls from the Kremlin, the lack of change in the demography of the main cities situated to the east of the Urals is notable, which has also been the case of all those cities along the route of the Trans-Siberian railway line[28]. The growth experienced by many of these cities was cut short by the crisis which ended with the dissolution of the Soviet Union.

Most writings that discuss the importance of the Northern Sea Route focus on the possible savings it could bring to the manufacturing economies of the West Pacific coast (although factors such as the competitive advantages brought about by reductions in transport costs and delivery as part of a *just-in-time* supply chain are rarely mentioned). Nevertheless, the changes referred to here go beyond the quantitative aspect of a reduction of up to 40% in the distance from Hong-Kong or Yokohama and centre on the qualitative changes that would take place in the Siberian Steppes.

26 For the moment, Moscow is set to make the Arctic a priority region for the operations of its Naval Forces. See:"Arctic Made Priority for Russian Navy in 2014", RIA Novosti, 2 December 2013. http://en.ria.ru/russia/20131202/185208917/Arctic-Made-Priority-for-Russian-Navy-in-2014.html

27 http://www.elmundo.es/elmundo/2010/07/03/internacional/1278169407.html

28 http://upload.wikimedia.org/wikipedia/commons/6/66/Siberian_Cities_Graph.svg

Thus the broad disciplinary range of studies on the region, and the effects that climate change will bring about there, tend to repeatedly underline the importance that the increasing flow of water from the Siberian rivers could have on the world ecosystem; with only few such studies discussing this fluvial waterway as a means of connecting with the interior of the continent.

In fact, the Trans-Siberian railway is practically the only line of surface communication crossing the continent across Russian territory. The limited road network, running mainly in an East-West direction is composed of one main thoroughfare which starts in Moscow as the M5, connects with Lake Baikal via the M51, M53 and M55, continues with the M58 and M60 to the Pacific.

Both the railway line and the road, however, follow a course along the southern margin of the country and while they serve to channel traffic coming from neighbouring countries, the vast majority of the Siberian territory remains *incommunicado*. The main mining basins and immense territories to the east of the Urals are basically isolated and, as a result, largely unexploited. Added to the innate difficulties of climate are the problems deriving from a lack of minimum infrastructures that would link resources with consumers.

The harnessing of the Siberian river basins for the urban and industrial development of these vast extensions could dramatically alter the Siberian landscape. As discussed previously, China and other countries are anxious to gain access to all kinds of mineral and energy resources, especially when these can be transported to production centres without being conditioned by the geopolitical situation, and without interference from possible attempts at prohibition on behalf of third powers.

There has been much speculation about –and even attempts at quantifying–the entity of mineral and energy resources that could be accommodated in the Arctic Ocean, once the melting of the ice floes because more permanent., while little attention has been paid to the resources already available, but which cannot be viably exploited through lack of adequate infrastructures in terms both of processing and transport.

The network of river and maritime communications that could potentially open up in Russia could transform their Asian territory into a centre of attraction for new investors and workers. The present state of infrastructures would force -rather than permit- these investments to take place in a wide spectrum of fields; not only in those related to extractive industries, but also those linked to other activities. The latter require the creation of a multitude of communities and means of transport.

Thus one returns to the demographic problem of the Russian federation and its incapacity to attract sufficient populations from within its own frontiers to these new (or growing) urban nuclei. Moscow is fully conscious of this circumstance and of the necessity to transform migration to the east and north into something that is attractive for its citizens. With this in mind, it has planned a range of incentives, which, as in

so many other areas, will be conditioned by budgetary constraints and prioritisation as laid down by the Kremlin.

Other alternative scenarios could include a lesser involvement of state initiative in the development of the interior regions connected by inland waterways with the major seaports that should be established along the Arctic Coast and greater input from private initiative. This could come from investors interested in getting the first slice of the cake from Siberian resources, above all in sectors linked with infrastructures or customer service areas of emerging communities. Nevertheless, it is also probable that third countries -China in particular- could decide to obtain concessions on minerals or energy resources in exchange for the construction of infrastructures (similar to the model employed in Africa) in a region which is closer and thus less vulnerable than the South African continent or South America.

Added to the tremendous imbalance between the rates of population density in Siberia and China (3 inhabitants per square kilometre as compared with 143) is the Chinese capacity for investment and the huge appetite demonstrated by its industry to satisfy an ever-increasing international demand. The connection of its resources and factories via inland terrestrial routes or coastal fleets would reinforce the offshoring trend of many large companies towards Asia.

Nevertheless, the same investment and manpower that could turn the tide of the tendency towards stagnation and the decline of Siberia could become a top-priority geopolitical challenge, more compelling even than that of the present-day Chinese penetration in the ex-Soviet republics of Central Asia. Moscow's apparent reservations in its dealings with the Shanghai Cooperation Organisation (SCO)[29] and its constant attempt to counteract the leadership that China wields in this area with the fomentation of the Collective Security Treaty Organisation (CSTO)[30] in the so-called "-stans" underline the Kremlin's sensitivity towards its loss of protagonism in its southern and eastern flanks.

A resolution to this difficult situation between the major Asian powers is rendered even more complicated in view of China's increasing assertiveness in its foreign relations. The urgent need for one or other regime to resolve internal conflicts could even give rise to situations of tension that could ultimately prove damaging to both parties.

29 The official page of the Shanghai Cooperation Organisation can be consulted at: http://www.sectsco.org/

30 The official page of the Collective Security Treaty Organisation can be consulted at: http://www.odkb.gov.ru/start/index_aengl.htm

Energy

Almost all studies on the Arctic make reference to the energy potential that lies beneath the marine subsoil. In some cases the exploitation of these resources has already begun where it is technically and economically viable, where there are no disputes over sovereignty or where these have been resolved in some way[31].

In spite of all the speculation, it is probable that the expectations raised by these deposits may not be materialised, or at least not to their full potential. Within the current changing world energy panorama, the appearance of new extractive technologies (or the practical application of old techniques, as is the case with fracking) have brought about substantial modifications to the balance previously in existence and to a certain extent a reversal in the upward trend of hydrocarbon prices.

In the medium term, the same environmental circumstances that permit access to fossil fuels in the Arctic beds could discourage their use or render their exploitation a much less profitable endeavour than it would be at present.

3. CONCLUSIONS

Climate change is a real phenomenon and is affecting the Arctic environment most especially. Although we are far from understanding the global impact of the ice-melt in the Arctic Ocean we should try to look beyond the immediate consequences that this will have on the local environment in the Polar Circle.

This paper has avoided offering an explanation or analysis of the scientific and climatological factors that also have repercussions for the entire planet. We have not discussed the impact of a larger discharge of river water and the melting of the polar ice-caps on the salinity and temperature of the oceans. We have not discussed these two parameters in terms of thermohaline circulation nor its effects in turn on the climatology of many temperate or tropical countries. Neither have we mentioned the rise in world sea-levels as a result of this same additional water input.

Nevertheless, all these factors will also alter the balances in existence at the present time. Entire islands or archipelagos will be submerged, displacing their populations

31 FOUCHE, Gwladys; "China, Norway may team up in search for Arctic oil", 13 November 2013. http://www.reuters.com/article/2013/11/13/us-iceland-oil-china-idUSBRE9AC0MW20131113

or altering their territorial jurisdictions, giving rise to or modifying conflicts. Coastal areas and in particular the major deltas will be flooded. These regions tend to be very densely populated and particularly fertile. Migration brought about by such flooding will deprive those who remain in the country not only of significant manpower, but also of major productive capacity. The baselines with which territorial waters and exclusive economic zones will also be altered, thus modifying sovereignty over marine resources.

All these circumstances are already taking place to a certain extent, but the process will tend to accelerate considerably in the future. In some cases this acceleration will be brought about by the same conditions that is provoking the melting process: the disappearance of the albedo, the release of methane from permafrost regions….

Here we have preferred to concentrate on the non-local effects of climate change in the Arctic on a very specific region; precisely in order to demonstrate that the phenomenon has an extraterritorial, even worldwide, characteristic, and why an understanding of the consequences in their entirety is necessary in order to truly evaluate the scope of the disappearance of polar ice.

The opening up of northern navigation ocean routes means that world maps have to be redrawn. This affects not only navigation charts, but also our perception of terrestrial sphericity. Until now we unconsciously looked upon the world (except in the case of air navigation) more as a cylinder than a sphere, given that we ruled out the poles as possible navigation routes. This change of perception is equivalent to moving from flat to spherical trigonometry: subtle, but nonetheless significant.

From a security and defence perspective, new fronts and possibilities arise. From a geostrategic perspective, we shall have to review many concepts that were marked by permanent ice. Many forms of understanding our world will have to change purely as a result of the opening of south-north routes.

These routes could, moreover, connect with waterways whose estuaries may have been blocked until now or flowed into impassable seas. Apart from the development of coastal communities servicing these maritime routes, the river basins will probably become important lines of communication favouring the development of immense interior regions particularly rich in resources.

The example of other similar regions leads us to imagine scenarios in which the major trade powers will seek to establish logistic bases. That has been the case of all maritime powers throughout history and it would be foolish to ignore the past.

A more interconnected, more interdependent and exposed world, will have to face simultaneously a multitude of rapidly changing climatological conditions that will force the adaptation or displacement of millions of people.

If mankind as a whole is to be capable of adapting to the numerous changes that lie ahead, it must first and foremost understand that it is not a question of dealing

with a local problem, but rather a global change in living conditions. We shall have to know how to compensate the negative effects on the habitability of one region with the positive effects brought about in another.

In addition one has to bear in mind that when we refer to climate conditions, we cannot distinguish the problems of one from those of others. Climate is a global system, and accordingly its implications are equally global.

Once again the impending climate crisis assumes this critical dimension on account of the changes it brings with it and the resulting need to face different and changing circumstances. Any crisis implies risks but opens up opportunities too. In crises of a global nature, the risks and opportunities can be separated by thousands of kilometres, or by decades. The particular crisis under analysis here will have to be managed by all and for the benefit of all, on account of the multiple facets it presents and in relation to which we still do not have all the relevant data.

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