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Foreign Policy

**Scientists are looking at some radical options to save our planet**

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Article 1.

The Washington Institute For Near East Policy

**Iran and the next U.S. President**

Dennis Ross

October 24, 2012 -- Regardless of who is elected on November 6th, Iran's nuclear program is going to be one of the most important challenges the next president is going to have to confront. Unless Iran's leaders shift course and suddenly decide to suspend their ongoing enrichment of uranium, the continuing progress of the Iranian nuclear program will require additional moves by the United States and the international community. From an American standpoint, it is important to remember that both President Barack Obama and Governor Mitt Romney have committed themselves to preventing Iran from acquiring nuclear weapons and not containing it after it has done so. At the current pace of Iran's nuclear efforts, the Iranian nuclear program will reach a point some time before the end of 2013 where the accumulation of low and medium enriched uranium will make it difficult for the United States to know with confidence that it could prevent Iran's leaders from presenting the world with a fait accompli --

meaning the Iranians might well be able to produce a nuclear weapon so quickly that we would not have time to prevent it.

To be sure, the Iranians could decide to slow the pace of their efforts either because they fear a military response or to try to gain sanctions relief given the economic pain they are experiencing. But that would require a change in Iran's behavior. Barring that, either a re-elected President Obama or a newly elected Governor Romney will have to decide what else needs to be done to fulfill their objective of prevention.

For President Obama, this is probably an easier task. He has lived with this issue for the last four years and thought it through. He has developed a strategy of increasing the pressure on the Iranians and the cost they pay for their continuing defiance of the international community, while also leaving them a diplomatic way out if they choose to take it. And there is no doubt that the Iranians are paying a terrible economic price: crippling sanctions have been imposed and led to a dramatic reduction in Iran's oil production and sales -- the principal source of revenue for the Iranian government. Iran's currency by some estimates is being devalued by half every two months, meaning that inflation is raging upwards, goods are dramatically more expensive and savings are losing their value. Doing business internationally has been made nearly impossible.

Iran's Supreme Leader, while maintaining a posture of defiance, recently described the sanctions as "brutal."

Previously, he always spoke of how the sanctions would make Iran stronger and more self-sufficient. Now he calls on Iran's officials to stop blaming each other for the economic maladies sanctions are imposing. None of this means that Khamenei, the Supreme Leader, is about to change course, but it does mean that for President Obama, the strategy of pressure is having an effect. Still, the Iranian centrifuges keep spinning and the Iranians keep accumulating enriched uranium. As a result, President Obama is likely to look for ways to intensify the pressure economically and coercively -- further emphasizing that the time for diplomacy is running out and all options are on the table.

Governor Romney has not lived with the issue for the last four years. Should he be elected, he will need time to establish his Administration and conduct a review of the issue. He is far less likely than President Obama to be able to move quickly on the issue, but like the President, he probably will see the value of increased economic and military pressure as a way of not simply raising the costs to the Iranians but also conveying to them that if diplomacy fails we will be prepared to use force.

Such a posture and such messaging will also give the Israelis a reason to continue to cooperate with the United States on the next steps vis-a-vis Iran. In his speech to the United Nations, Prime Minister Netanyahu focused on the importance of Iran seeing that there is a red-line it should not cross in its nuclear development. His red-line was on limiting Iran to less

than a bomb's worth of medium enriched uranium; in truth, what he was getting at is how to define the meaning of prevention and ensuring that Iran does not pass the point where prevention can no longer be achieved. In this connection, applying greater pressure on the Iranians matters to the Israelis, particularly because it conveys a readiness to do what is necessary to prevent Iran from gaining nuclear weapons. But it will also be important to discuss our respective views on how to ensure prevention -- as the Obama Administration is doing with the Israelis. No doubt that will continue if President Obama is re-elected or if Governor Romney becomes president.

But there is one other thing both are likely to do. Each is likely to try a more dramatic diplomatic initiative or end-game proposal with the Iranians. They will do it not just to test the possibility that Iran may yet be prepared to accept an outcome that provides them civil nuclear power but with restrictions that would prevent them from having a break-out capability to nuclear weapons. They will do it not just to expose the Iranians before the world and their own public if they turn down such a proposal. They will do it also to show the American public that we went the extra mile if force proves necessary.

No American president will resort to force without such a demonstration. The stalemated talks between the 5+1 and the Iranians have focused largely on a step by step approach designed to have the Iranians show they are prepared to bring their nuclear program into compliance with their international obligations. If

there was plenty of time to let the pressures build on the Iranians, the step by step approach might yet work. But with 2013 looming as a decisive year one way or the other, either President Obama or Governor Romney is likely to see the need to accelerate the diplomatic process to create far greater clarity. If there is to be a diplomatic way out of the conflict with the Iranians over their nuclear program, sharpening the choice for Iran's leaders may also be the only way to produce it.

*Dennis Ross is counselor at The Washington Institute.*

Article 2.

Muftah

## **Iran's Economic Crisis: A Failure of Planning**

Reza Ghasimi

Oct 22, 2012 -- Recently, Iran's currency, the rial, dropped to historic new lows. By October 1, 2012, the currency had plummeted to 35,000 rials to the dollar – it had stood at 25,000 rials to the dollar only a week earlier. Only a few days later, the currency dropped even further to 40,000 rials to the dollar.

In response, protests erupted outside Tehran's old and largest bazaar. The government closed currency exchange shops and rounded up hundreds of illegal money changers, in the hopes of curbing the rials' financial slide.

These events have contributed to disruption and instability in the Iranian economy, which already suffers from high unemployment, low output, and soaring inflation. As reflected in the October 2012 World Economic Outlook, prepared by the International Monetary Fund, the Iranian economy faces a number of challenges. According to the report, in the coming year, the Iranian economy is predicted to have growth of -0.9 percent, unemployment of over 14 percent, and a wild inflation rate of 25 percent. A combination of mismanagement, bad economic planning, inadequate attention to the adverse impacts of international economic and financial sanctions, and the strained relationship between Iranian businesses and the outside world has contributed to Iran's current economic woes. The situation has been further aggravated by low tolerance within the Iranian government for constructive criticism, lack of interest in expert opinions, lack of flexibility in dealing with the outside world and a disinterest in looking to the experiences of other countries to find solutions to similar economic issues.

Following the end of the eight-year war with Iraq, the Islamic Republic of Iran focused on formulating and carrying out Five Year Development Plans (FYDPs). The 4th and 5th FYDPs, respectively launched in, 2005/06 and 2011/12, were part of a 20-year economic and social vision that was expected to improve the Iranian economy's international ranking. Unfortunately, however, these plans contained many implausible targets and set largely unattainable goals.

While the 4th FYPD set a target of 8% growth in GDP, the actual average growth in GDP during this period was 5%. GDP performance has also been inadequate during the initial years of the 5th FYDP. Similarly unrealistic objectives for employment, inflation, liquidity, productivity, domestic and foreign investment, poverty reduction, oil exports, and research and development also remained unachieved during these periods.

The government's subsidy reform program is a particularly salient case study in the failure of Iranian economic planning. The reform aims at compensating households through cash handouts for energy price increases. The 20-month period for implementation of subsidy reforms, the 5th FYDP's cardinal reform package, was, however, unsatisfactory. Despite the reform program's boldness, several shortfalls—e.g., cash compensation to everyone, both rich and poor, and disregard for the experiences of other countries—contributed to a number of negative outcomes. Large cash compensation payment deficits intensified government dependence on Central Bank resources. This accelerated already high levels of liquidity in the Iranian economy. This in turn increased inflation, which was in fact to be redressed by the subsidy reform program.

The 4th and 5th FYDPs represent one third of Iran's 20-year economic vision cycle. In developing the 5th FYPD, policy makers failed to learn from the outcomes of the 4th FYDP and based the remainder of the 20-year vision upon feeble, quivering pillars.

These plans failed to pay attention to the adverse effects of international economic and financial sanctions, which unfavorably harmed the government's normal operations and adversely affected the Iranian business communities' relationships and approach to the outside world. Closing the Plan and Budget Organization, which was responsible for the preparation of annual budgets, development plans and the monitoring of their implementation, and replacing it with a small planning unit, annexed to the president's office, was a major misstep. Denying input from technocrats and experienced economists in the planning process resulted in the pursuit of unrealistic goals and objectives. Low tolerance for constructive criticism and a disregard for the experiences of other countries resulted in a lack of deep analysis and constituted another shortcoming of the 4th and 5th FYDPs and the 20-year vision.

To transform the Iranian economy into a regional leader, the 5th FYDP and the 20-year vision should be revised to incorporate lessons learned so far under these plans. These planning strategies must also remain compatible with the country's domestic capacity, encourage the sharing and incorporation of experts' opinions, and be subject to deep analysis based on other countries' experiences.

The revised plans should present clear priorities for private sector development, establish ease of business entry and exit, and present realistic strategies for attracting foreign direct investment and modern

technology. The plans should be implemented via stable rules and regulations and be supported by reliable judicial and regulatory frameworks.

For example, with regard to the subsidy reform program, the government should continue with its reforms but should organize a group of experienced economists and administrators to supervise day-to-day reform operations, remain open to expert advice, and if necessary, modify reform measures.

The Iranian planning experience has also revealed a clear disengagement between five-year plans, annual budgets, and government economic policies. Under these conditions, development and integration of a Medium Term Expenditure Framework (MTEF) within the revised 5th FYDP and future plans is indispensable to creating a multi-year budgetary framework that links five-year plans.

Recently, Iranian authorities have alluded to developing a “resistance economy plan” that would contest international sanctions through a mixture of policies, including financing imports from non-oil exports. International financial sanctions have drawn attention to Iran’s uncertain and reluctant private sector and to the complex hurdles it faces with regard to both oil and non-oil exports.

These conditions present Iran with two challenging choices. First, while remaining under international economic and financial sanctions, Iran could incorporate “resistance economy plan” features within the revised 5th FYDP and the 20-year vision to avoid designing another complicated plan that adds to an

already sizable menu of options and accumulates still more unrealized expectations. Second, while avoiding further international economic and financial sanctions, Iran could adopt a conciliatory international posture that would diminish current sanctions and allow it to implement the revised 5th FYDP and the 20-year vision in an improved domestic and international environment. The second choice would appear to present a more attainable approach to facilitating a return to normal life for many hardworking and deserving Iranian people.

These and other issues facing the Iranian economy and its 4th and 5th FYPD are discussed at length in a comprehensive report I have written: *The Iranian Economy under Its Fourth and Fifth Five Year Development Plans*. The report is linked below and will be of great interest to anyone seeking detailed information about how Iran's economic planning strategies have led to its current economic crisis.

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Article 3.

Center for Strategic and International Studies

# **Cautious Optimism on Egypt**

Jon B. Alterman

Oct 23, 2012 -- Everyone expected Egypt to be working out better by now, especially Egyptians. Spending a week in Cairo earlier this month, there was barely a whiff of the euphoria of early 2011, when the country united to bring down the government. Even so, there is an energy in Egypt that wasn't there before. Egypt's "new normal" isn't quite normal, but it still gives cause for optimism.

That may seem a strange thing to say, because few Egyptians are especially optimistic. Immediately after Hosni Mubarak's downfall, loose talk about the supposed \$70 billion embezzled by the president and his family led many to believe that the end of Egypt's problems was nigh. Repatriation of those funds, and plugging the leaks in the economy that had let the ruler amass a fortune, would soon make Egypt a middle-income country, they thought. Ending the corruption that had enriched Mubarak's entourage would free billions more.

Yet, there were no billions to be found. Money has become harder to come by rather than easier, as wealthy Egyptians stash funds overseas and foreign investors cautiously wait for a clearer political picture. Foreign tourists are also waiting for a clearer picture before they return in large numbers, and the police remain a shadow of what they once were. Strikes seem to be a daily occurrence. Altering multibillion dollar

subsidy programs without devastating tens of millions of Egypt's poor will take years to do; repairing the rest of the rot in the Egyptian economy will take years more.

Politically, the seemingly endless cycle of elections and referenda that began shortly after Mubarak's fall have not let up. Many more rounds are to come. To the consternation of many, the Muslim Brotherhood's political prominence seems likely to be a permanent feature of Egyptian politics. Not only are their organizational skills and discipline unsurpassed in Egyptian life, but they seem to be the only institution that emerged from 60 years of authoritarian rule with a sophisticated political sensibility.

The Brotherhood's governing skills have been somewhat less impressive. President Muhammad Morsi made a litany of promises for his first 100 days, but according to the independent "Morsi Meter," he was able to fulfill just over 15 percent of them and make progress on another third. New government officials continue to make rookie errors, and veteran officials wonder about their own futures. Meanwhile, the economy is still ailing, and a deal with the International Monetary Fund—which all agree is an essential foundation for economic recovery—remains elusive. The saga of creating a new constitution continues to drag on, with colorful disputes grabbing headlines amidst uncertainty over whether the current constituent assembly drafting the constitution will ever finish its work or be pre-empted by the president appointing his own committee.

And yet, amidst all of this is good news. The biggest part of the good news in Egypt is that no group is under the illusion that it can govern alone. Whatever its electoral strength—some of which is comparative rather than absolute—the Brotherhood understands it needs a coalition to rule the country. Further, it appears to have concluded that liberal and independent voices make more durable political partners than the other religious parties, which by their nature challenge the Brotherhood's religious legitimacy. This dynamic began to play itself out in parliament before it was dissolved, and it continues to play itself out in the constitution-writing process. There is no Islamist supermajority. The Brotherhood has also proven cautious in its dealings with the military. The headlines in August were over the dismissal of Field Marshall Hussein Tantawi, Chief of Staff Sami Anan, and Director of General Intelligence Murad Muwafi, but closer observation suggests that the military has returned to its traditional role more than it has suffered a defeat. Egyptian policy toward the United States and Israel, which was the foundation of the U.S. relationship with the Egyptian military, has changed only modestly. The elected government seems to have little appetite for taking on the United States, Israel, or the military itself. Economically, the government needs all the help it can get, and it has sought allies rather than enemies overseas. Closer to home, there have been no massive expropriations or nationalizations. Anticorruption

prosecutions have been limited to the highest echelons of the former regime. Tellingly, there is no massive exodus, among businessmen or anyone else. Panic seems absent in Egypt, and virtually all Egyptians seem to feel there is a possibility that they will be able to protect their interests in the new order.

Even the dysfunction in the constitutional drafting process has its silver lining. A swift and bold constitution process that deeply engaged the public would almost certainly polarize the population and set off pitched political battles. The more drawn out and uncertain process Egypt is undergoing now holds out the prospect of grudging acceptance with less risk of violence.

Almost all of Egypt's problems still lay in front of it, and some seem insurmountable. Yet, among the most dangerous outcomes of the last 20 months would be a process in which a large swath of Egyptians had concluded there was no way politics could meet their needs and their only options would be to take up arms or leave the country. That has happened in neighboring countries, but it has not happened in Egypt. Instead, expectations have been lowered and timelines expanded.

Political tensions in Egypt are not a sign of failure, but rather a sign that politics are working. Politics, after all, are about juxtaposing contrasting views as much as about unifying a constituency. Even more important, the defining characteristic of a democratic system is not people's willingness to win. Instead, it is their willingness to lose, because they have faith that

they just might win the next time.

Many have lost in Egypt. So far, they are behaving like democrats. Their legitimate concern is that the winners behave like democrats, too.

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Article 4.

The Economist

## **Turkey, Syria and the Kurds**

Oct 20th 2012 -- A GIANT Kurdish flag undulating atop a raised plateau inside Syria faces the town of Senyurt in Turkey's mainly Kurdish south-east. At the local headquarters of the ruling Justice and Development (AK) party, a grey slab engraved with Ataturk's aphorism "Happy is he who calls himself a Turk" gathers dust under a stairwell. Across the street at the gendarmerie, another slogan—"Loyalty to the army is our honour"—glints through barbed wire. The scene encapsulates Turkey's Kurdish (and Syrian) impasse. The Turkish prime minister, Recep Tayyip Erdogan, has long called for Syria's president, Bashar Assad, to go. Turkey now hosts over 100,000 refugees from Syria. Tensions between the two countries have almost tipped into open war. Yet there is no sign of an

early end to the Syrian conflict. And the withdrawal of Syrian forces from mainly Kurdish towns along the border has raised the stakes in the Turkish state's 28-year battle with the Kurdistan Workers' Party (PKK). The towns are now run by the PKK's Syrian franchise, the Democratic Union Party (PYD). As well as setting up Kurdish-language schools and Kurdish outfits, the PYD is busily arming itself, forming three battalions so far. It claims this is to defend against the chaos that may ensue after Mr Assad's fall. But in the eyes of an increasingly hawkish Mr Erdogan, the PYD is the PKK—and its main enemy is Turkey. The Kurds fear they, not Mr Assad's forces, are the target of Turkish troops and tanks deployed along the border. They think a bill just adopted by the Turkish parliament to authorise the army to intervene abroad is aimed at them. This is overwrought. Yet Turkey is clearly rattled by the prospect of a quasi-independent Syrian-Kurdish entity emerging beside the Iraqi-Kurdish statelet in northern Iraq. In Nusaybin, farther along the border, the Kurdish Peace and Democracy Party (BDP) mayor, Ayse Gokkan, gestures at the Syrian town of Kamishli, partly under PYD control. When the Kurdish flag was raised over Kamishli, thousands of locals took to the streets in celebration. "These borders are artificial, for centuries we lived as one, our hearts are one, our aims are one, our suffering is one," she sighs. At the BDP-run Mitanni cultural centre, young Kurds are making up for lost time, performing dramas and songs in the most widely spoken Kurdish dialect, Kurmanji. "Independent maybe, autonomy

definitely,” grins a teenager playing the role of Hamlet.

The PKK often seems less concerned with Kurdish rights than with undermining the AK party. The rebels have escalated their violent campaign inside Turkey, killing scores of soldiers and policemen. And right across the south-east, the PKK has embarked on a terrorist spree, burning government buildings, raiding schools, wounding children and kidnapping teachers to weaken the state’s grip.

The fiercest fighting has been in the mountains around Semdinli, a town wedged between Iran and Iraq. Cemil Oter, leader of the powerful Jirki tribe, which has fought on the side of the army against the PKK, suggests that Turkish rule over Semdinli has become a polite fiction. Mr Oter, once an ardent supporter of Mr Erdogan, used to tell his people to vote AK. “He gave us more hope than any other Turkish leader,” acknowledges Mr Oter. But “now he has become just like the others, we won’t vote for him again.” AK is the BDP’s sole rival in the region. It swept up half the Kurdish votes in the south-east in 2007. In 2009 Mr Erdogan came tantalisingly close to peace, first by taming Turkey’s meddlesome generals and then by introducing reforms that gave the Kurds greater linguistic and cultural freedoms. He also began secret talks with the imprisoned PKK leader, Abdullah Ocalan, in hopes of ending an insurgency that has cost nearly 50,000 lives. But Mr Erdogan’s 2009 “Kurdish opening” was closed after he was re-elected last year. Critics claim that Mr Erdogan ditched the Kurdish

opening in a cynical bid to court nationalist votes that may carry him to the presidency when it becomes free in 2014. They also say his promises of a new democratic constitution will come to nothing. The government retorts that, by stepping up its terrorist attacks, the PKK has made it impossible to get the Turkish public on board. Even as Turkish fighter jets rained bombs on PKK camps in northern Iraq this week, the government was unveiling textbooks for Kurmanji classes in state schools. An official Kurdish-Turkish dictionary is in the works, and defendants will be allowed to speak Kurdish in court. Yet with each new concession, the PKK keeps raising the bar. The rebels now insist they will not resume talks unless Mr Ocalan is moved out of solitary confinement and placed under “humane conditions” (ie, house arrest). Hundreds of PKK prisoners have gone on indefinite hunger strike to this end. Mr Ocalan, who is revered by Kurds, could yet be the key to peace. But after 13 years of solitary confinement his health is waning and so is his grip. Indeed, as the PYK consolidates its hold in Syria, a solution seems to be slipping out of Turkey’s hands. Many believe that Mr Erdogan’s Syrian policy, especially his support for the opposition Free Syrian Army, is to blame. “They freed the border from Assad, only for the PKK to step in,” says one opposition MP. Moreover, by seeking to oust Mr Assad, Turkey has antagonised his chief allies, Iran and Iraq, prompting them to rekindle their alliances with the PKK. The economic cost is also rising. Turkey has lost an estimated \$3 billion in annual

trade. Nusaybin, a former hub for suitcase traders, has been hit hard since its border with Syria was sealed in December. Shuttered shops line the streets. Unemployment, says Mrs Gokkan, has rocketed to 90%. With few prospects, Nusaybin's youths are natural recruits for the PKK.

Article 5.

Foreign Affairs

## **No Wars for Water**

Shlomi Dinar, Lucia De Stefano, James Duncan, Kerstin Stahl, Kenneth M. Strzepek, Aaron T. Wolf

October 18, 2012 -- The world economic downturn and upheaval in the Arab world might grab headlines, but another big problem looms: environmental change. Along with extreme weather patterns, rising sea levels, and other natural hazards, global warming disrupts freshwater resource availability -- with immense social and political implications. Earlier this year, the Office of the Director of National Intelligence published a report, Global Water Security [1], assessing hydropolitics around the world. In it, the authors show that international water disputes will affect not only the security interests of riparian states, but also of the United States.

In many parts of the world, freshwater is already a scarce resource. It constitutes only 2.5 percent of all available water on the planet. And only about .4 percent of that is easily accessible for human

consumption. Of that tiny amount, a decreasing share is potable because of pollution and agricultural and industrial water use. All that would be bad enough, but many freshwater bodies are shared among two or more riparian states, complicating their management. Of course, the policy community has long prophesied impending "water wars." In 2007, UN Secretary General Ban Ki Moon warned that "water scarcity ... is a potent fuel for wars and conflict." Yet history has not witnessed many. In fact, the only official war over water took place about 4,500 years ago. It was a conflict between the city-states of Lagash and Umma in modern day Iraq over the Tigris river. More recently, there have been some close calls, especially in the arid Middle East. About two years before the 1967 War, Israel and Syria exchanged fire over the Jordan River Basin, which both said the other was overusing. The limited armed clashes petered out, but the political dispute over the countries' shared water sources continues. In 2002, Lebanon constructed water pumps on one of the river's tributaries, which caused concern for downstream Israel. The project never provoked any formal military action, but with peace in the region already precarious, verbal exchanges between the two countries prompted the United States to step in. Both parties eventually accepted a compromise that would allow Lebanon to withdraw a predetermined amount of water for its domestic needs.

In short, predictions of a Water World War are overwrought. However, tensions over water usage can

still exacerbate other existing regional conflicts. Climate change is expected to intensify droughts, floods, and other extreme weather conditions that jeopardize freshwater quantity and quality and therefore act as a threat-multiplier, making shaky regions shakier.

So what river basins constitute the biggest risks today? In a World Bank report [2] we published in 2010 (as well as a subsequent article in a special issue of the Journal of Peace Research [3]) we analyzed the physical effects of climate change on international rivers. We modeled the variability in river annual runoff in the past and for future climate scenarios. We also considered the existence and nature of the institutional capacity around river basins, in the form of international water treaties, to potentially deal with the effects of climate change.

According to our research, 24 of the world's 276 international river basins are already experiencing increased water variability. These 24 basins, which collectively serve about 332 million people, are at high risk of water related political tensions. The majority of the basins are located in northern and sub-Saharan Africa. A few others are located in the Middle East, south-central Asia, and South America. They include the Tafna (Algeria and Morocco), the Dasht (Iran and Pakistan), the Congo (Central Africa), Lake Chad (Central Africa), the Niger (Western Africa), the Nile (Northeastern Africa), and the Chira (Ecuador and Peru). There are no strong treaties governing the use of these water reserves in tense territories. Should

conflicts break out, there are no good mechanisms in place for dealing with them.

By 2050, an additional 37 river basins, serving 83 million people, will be at high risk for feeding into political tensions. As is the case currently, a large portion of these are in Africa. But, unlike today, river basins within Central Asia, Eastern Europe, Central Europe, and Central America will also be at high risk within 40 years. Some of these include the Kura-Araks (Iran, Turkey, and the Caucasus), the Neman (Eastern Europe) Asi-Orontes (Lebanon, Syria, Turkey), and the Catatumbo Basins (Colombia and Venezuela).

#### CROSSING THE NILE

Among the larger African basins, the Nile has the greatest implications for regional and global security. Tensions over access to the river already pit Ethiopia and Egypt, two important Western allies, against one another. Egypt has been a major player in the Middle East Peace Process and Ethiopia is an important regional force in the Horn of Africa, currently aiding other African forces to battle Al-Shabbab in Somalia. Over the years, a number of international water treaties have made rules for the basin, but they are largely limited to small stretches of it. In particular, only Egypt and Sudan are party to the 1959 Nile River Agreement, the principal treaty regarding the river. Egypt, which is the furthest downstream yet is one of the most powerful countries in the region, has been able to heavily influence the water-sharing regime. Upstream countries, such as Ethiopia and Burundi, have been left out, hard-pressed to harness the Nile for

their own needs.

In 1999, with increasingly vitriolic rhetoric between Egypt and Ethiopia sidetracking regional development, the World Bank stepped up its involvement in the basin. It helped create a network of professional water managers as well as a set of investments in a number of sub-basins. Still, the drafting of a new agreement stalled: upstream countries would not compromise on their right to develop water infrastructure while downstream countries would not compromise on protecting their shares. In 2010, Ethiopia signed an agreement with a number of the other upstream countries hoping to balance against Egypt and Sudan. More recently, the country has also announced plans to construct a number of large upstream dams, which could affect the stability of the region.

By 2050, the environmental state of the Nile Basin will be even worse. That is why it is important to create a robust and equitable water treaty now. Such a treaty would focus on ways to harness the river's hydropower potential to satiate the energy needs of all the riparian states while maintaining ecosystem health. The construction of dams and reservoirs further upstream could likewise help even out water flows and facilitate agricultural growth. Projects such as these, mitigating damage to ecosystem health and local populations, would benefit all parties concerned and thus facilitate further basin-wide cooperation.

#### UP IN THE ARAL

Another water basin of concern is the Aral Sea, which

is shared by Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. The basin consists of two major rivers, the Syr Darya and Amu Darya. During the Soviet era, these two rivers were managed relatively effectively. The break-up of the Soviet Union, however, ended that. The major dispute now is between upstream Kyrgyzstan and downstream Uzbekistan over the Syr Darya. During the winter, Kyrgyzstan needs flowing water to produce hydroelectricity whereas Uzbekistan needs to store water to later irrigate cotton fields.

The countries have made several attempts to resolve the dispute. In particular, downstream Uzbekistan, which is rich in fuel and gas, has provided energy to Kyrgyzstan to compensate for keeping water in its large reservoirs until the cotton-growing season. Such barter agreements, however, have had limited success because they are easily manipulated. Downstream states might deliver less fuel during a rainy year, claiming they need less water from upstream reservoirs, and upstream states might deliver less water in retaliation. Kyrgyzstan, frustrated and desperate for energy in winter months, plans to build mega hydro-electric plants in its territory. And another upstream state, Tajikistan, is likewise considering hydro-electricity to satiate its own energy needs. Meanwhile, Uzbekistan is building large reservoirs. Although these plans might make sense in the very near term, they are inefficient in the medium and long term because they don't solve the real needs of downstream states for large storage capacity to protect

against water variability across time. In fact, both Kyrgyzstan and Uzbekistan, along with Kazakhstan, will see substantial increases in water variability between now and 2050. And so, the need to share the benefits of existing large-capacity upstream reservoirs and coordinate water uses through strong and more efficient inter-state agreements is unavoidable.

A stabilized Aral Sea basin would also benefit the United States. With its withdrawal from Afghanistan, Washington has been courting Uzbekistan as a potential alternative ally and provider of stability in the region. The Uzbek government seems willing to host U.S. military bases and work as a counter-weight to Russia. Kyrgyzstan is also an important regional player. The Manas Air Base, the U.S. military installation near Bishkek, is an important transit point. The country is also working with the United States to battle drug trafficking and infiltration of criminal and insurgent groups. Regional instability could disrupt any of these strategic relationships.

If the past is any indication, the world probably does not need to worry about impending water wars. But they must recognize how tensions over water can easily fuel larger conflicts and distract states from other important geopolitical and domestic priorities. Since formal inter-state institutions are key to alleviating tensions over shared resources, it would be wise, then, for the involved governments as well as the international community to negotiate sufficiently robust agreements to deal with impending environmental change. Otherwise, freshwater will only

further frustrate stability efforts in the world's volatile regions.

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Article 6.

Foreign Policy

## **Scientists are looking at some radical options to save our planet**

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October 24, 2012 -- How serious is the threat of global warming? One way to figure out is to take your cues

from some leading climate scientists: They have moved on. That doesn't mean they've abandoned the issue, but they are looking beyond what all agree is the most obvious solution -- decreasing the amount of carbon we spew into the atmosphere in the first place. These scientists are beginning to look for a Plan B. There are two distinct approaches under consideration -- sucking carbon out of the atmosphere, or creating an artificial sun shield for the planet. The former, which involves reversing some of the very processes that are leading to the climate problem, is expensive. The latter just sounds scary. David Keith, a leading thinker on geoengineering, calls it "chemotherapy" for the planet. "You are repulsed?" he says. "Good. No one should like it. It's a terrible option."

Repugnant or not, with the globe failing to develop other ways to halt climate change, geoengineering is increasingly becoming an option. The science and engineering are relentlessly marching on: Most research so far has focused on computer modeling, but some has started to move beyond -- trying to test, for example, how to deliver particles into the upper reaches of the atmosphere. This summer, an entrepreneur conducted a rogue experiment, dumping 100 tons of iron into the Pacific in an attempt to "seed" the ocean and spur the removal of carbon dioxide from the atmosphere. This episode represents a particularly apt example of science -- in this case, self-experimentation -- speeding far ahead of public opinion and oversight.

The high costs of doing nothing

If the world can't get its act together to limit carbon emissions, geoengineering may be the only option we have. Distill the climate problem down to the essentials, and it becomes obvious that global warming is fundamentally a market failure: All seven billion of us human beings are "free riders" on a planet that is heating up. We put billions of tons of carbon dioxide into the atmosphere every year, and largely aren't required to pay for the privilege. There's too little incentive to stop polluting.

Americans are some of the world's worst offenders. Every U.S. citizen, on average, emits around 20 tons of carbon dioxide a year -- twice that of the average European. All kinds of things contribute to that number. Driving the average U.S. vehicle in an average year accounts for more than 5 tons. The full carbon footprint of the average thrice-weekly cheeseburger: half a ton a year. One roundtrip cross-country flight: one ton.

Each of these tons of carbon dioxide causes at least \$20 worth of damage in adverse health effects, flooded coastlines, and other effects of climate change. By mid-century, that figure will rise to at least \$50. And a truly catastrophic event caused by a warmer climate, like Antarctic ice sheets collapsing long ahead of schedule or Arctic methane bubbling up at precipitous rates, resulting in runaway global warming, could increase those costs by a factor of 10 or more. How do you put a price tag on even a 1 percent risk of altering the climate so much that it could destroy civilization as we know it?

Few of us are paying our fair share for the damage that we're doing to the planet. For example, airlines don't add \$20 to ticket prices in order to pay for the damage caused per passenger by flying back and forth across the country. That decreases costs up front, but it also comes at enormous cost to society down the road. The world's population -- led by the one billion or so global high emitters -- are doing many hundreds of billions of dollars of damage to the planet, and in the near future the costs will skyrocket into the trillions. "Free riding" also plagues relations between countries. Some, like the European Union have a cap or tax on carbon pollution. Most are still waiting on the sidelines. Why should any single country cut its carbon emissions when it knows that its reductions will only be a drop in the bucket toward solving climate change -- and other nations aren't asking their citizens to pay their fair share? Blame it on short election cycles, partisanship, or fossil energy interests, the political will often doesn't exist -- whether in Washington or the latest global environment gathering in Rio de Janeiro.

Sitting in the driver's seat

"Free riders" are only half the problem. "Free drivers" may be as important. The allure of geoengineering derives from the simple fact that - given what little we know about it at the moment - it appears to be a comparatively cheap way to combat climate change. And it doesn't take a global agreement to act. It takes one actor - one country - in the driver's seat.

If, for example, the very existence of an island, nation,

city, or agricultural region is threatened by global warming, the question among its leaders will no longer be whether geoengineering is an option, but what the effects, positive and negative, might be and how it could be carried out. That's also where the science stands today, and the economics points in the same direction.

One option that will inevitably come under consideration is the possibility of shooting reflecting particles into the upper atmosphere to create an artificial sun shield for the planet. Blocking some of the sun's rays from hitting the planet may sound like science fiction or hubris, or both. But geoengineers are already looking at which particles would work best, and how to deliver them: Planes, balloons or multiple mile-long hoses are all contenders.

All these options have one thing in common: They are cheap - at least from the narrow perspective of those doing the geoengineering. Hence the "free" in "free driver."

In fact, the price tag of these geoengineering strategies is likely to be negligible relative to the purported benefits: Columbia University's Scott Barrett, among others, has calculated that it would cost pennies to offset a ton of carbon dioxide from the atmosphere. By comparison, it costs dollars per ton to reduce carbon dioxide emissions in the first place.

The higher cost of attacking the problem head-on, by reducing carbon emissions, would still be a bargain compared to the financial, ecological and human costs of unchecked global warming. But "free riding" is so

much easier, politically and financially. That's what makes the "free driver" effect so powerful. Geoengineering is seductively cheap, and it doesn't take the collective will of billions of people - or policies guiding those billions - to have a major effect. Anyone capable of flying a fleet of planes at high altitudes could conceivably have a go at altering the planet's atmosphere, and do so at a fraction of the cost of decreasing carbon dioxide pollution. But here's the catch: Nobody knows the costs of potential unknown and sometimes unknowable side effects, and there could be grave political and legal repercussions when someone starts playing God with the climate.

#### Proof by volcano

What makes scientists believe geoengineering could work? It's been tried before - by nature, not by humanity.

When Mount Pinatubo erupted in June 1991, it forced the evacuation of 200,000 Filipinos and shot 20 million tons of sulfur dioxide into the stratosphere. The added sulfur counteracted the effect of 1,100 billion tons of carbon dioxide that had been accumulating in the atmosphere since the dawn of the industrial revolution. In 1992 and 1993, it decreased global temperatures by a bit less than 1 degree Fahrenheit by reducing the amount of sunlight that hit the earth's surface. That was about the same amount temperatures had risen at that point from carbon added to the atmosphere by human activity. In other words, Mount Pinatubo alone offset all temperature increases from the beginning of the Industrial Revolution.

The aftermath of Mount Pinatubo's eruption suggests the limitations of this kind of geoengineering. The excess carbon dioxide in the air isn't being removed - geoengineering would simply add millions of tons of sulfur dioxide (or some custom designed material) to the atmosphere. That might lower temperatures -- but it would not address other problems caused by global warming. For example, it wouldn't stop the ongoing acidification of the oceans, which may kill much of the life they hold.

And there will probably be a host of unknown, unexpected consequences. For example, some climatologists blame the Mount Pinatubo eruption for flooding along the Mississippi River in 1993 and for droughts in sub-Saharan African. That still pales in comparison to the 1815 eruption of Mount Tambora in present-day Indonesia, which caused the "year without a summer" linked to some 200,000 deaths across Europe in 1816. Incidentally, the eruption also had some unexpected cultural repercussions: All those overcast days also forced Mary Shelley and John William Polidori to spend much of their Swiss summer holidays indoors, jumpstarting the creation of both Frankenstein and The Vampyre (an inspiration for Dracula).

It doesn't take much imagination to see that pumping one pollutant into the atmosphere in an attempt to offset the effects of another could backfire. It may also be impossible to demonstrate which adverse climate events were caused by which single geoengineering intervention. That throws a wrench into the traditional

research model: It's one thing to study the effects of a past volcanic eruption or to fiddle in a lab with self-contained experiments. It's quite another to devise an experiment that could be conducted in the real world. It would be all too easy to blur the line between experiment and deployment. That and many other questions need to be answered, lest we enter wholly uncharted territory when it comes to playing with the atmosphere of our shared home.

Seat belts are good, but there's no avoiding speed limits

Talk of geoengineering inevitably leads to the question of "moral hazard." Will the exploration of these technologies lull humanity into thinking that it need not act responsibly and cut carbon emissions? Perhaps. Seat belt laws may make some drivers feel so safe that they drive more recklessly. Still, that is hardly an argument against those laws.

While the international community should not abandon efforts to limit carbon emissions, scientists must also be prepared to take geoengineering seriously. Humanity may already have passed so many global warming tipping points that - even with radical action to cut emissions - it may be important to have some form of geoengineering in our toolkit.

The worst we can do is fall into the trap of thinking geoengineering is a panacea to our climate change problem. While its initial costs may be seductively low, no one knows the unintended consequences of trying to alter the planet's atmosphere. Just as it seems to cost almost nothing to emit carbon - leading all of

us to emit more than we ought to - geoengineering may appear cheap at first, only to leave humanity and nature to foot a much larger bill later on. "Free riding" turns out not to be cheap after all. "Free driving" may face the same conclusion.

Nor is it likely that everyone will face the same costs. Climate change does not affect all areas of the globe evenly. Neither will geoengineering. What if it leads to a further drying out of the southwestern United States or of sub-Saharan Africa, or to flooding elsewhere?

While the risks cannot be ignored, not even considering geoengineering research is clearly not an option. Desertification and flooding are also among the many consequences of unchecked global warming. The benefit-cost calculation of geoengineering must take these effects into account. The fact that climate change's effects are distributed unevenly around the globe may also lead some nations to experiment with geoengineering on their own. India's national security advisor wouldn't be doing his job if he didn't at least consider countering the monsoon effects of carbon with relatively small amounts of extra sulfur. And Bangladesh's finance minister would be remiss if he didn't weigh the all-too-real costs of moving tens of millions of people against the benefits of cloud-brightening (another possible way to deflect more sunlight back into space).

In short, it will not just be up to U.S. scientists or a handful of technologically advanced countries to weigh the pros and cons of geoengineering. These

technologies will be available to many countries - and as we see today, world leaders don't always succeed in working together to combat the threat of climate change.

All it takes is a single actor willing to focus on the purported benefits to his country or her region to pull the geoengineering trigger. The task with geoengineering is to coordinate international inaction while the international community considers what steps should be taken. The fate of the planet cannot be left in the hands of one leader, one nation, one billionaire. Fortunately, we are still many years off from the full "free driver" effect taking hold. There's some time to engage in a serious global governance debate and careful research: building coalitions, guiding countries and perhaps even individuals lest they take global matters into their own hands. In fact, that is where the discussion stands at the moment, with a governance initiative convened by the British Royal Society, the Academy of Sciences for the Developing World, and the Environmental Defense Fund, among other deliberations guiding how geoengineering research should be pursued.

With time come the "free drivers"

The clock, however, is ticking. A single dramatic climate-related event anywhere in the world - think Hurricane Katrina on steroids - could trigger the "free driver" effect. That event need not be global and it need not even be conclusively linked to global warming. A nervous leader of a frightened nation might well race past the point of debate to

deployment. The "free driver" effect will all but guarantee that we will face this choice at some point. "Free riding" and "free driving" occupy opposite poles of the spectrum of climate action: One ensures that individuals won't supply enough of a public good. The other creates an incentive to engage in potentially reckless geoengineering and supply a global bad. It's tough to say which one is more dangerous. Together, these powerful forces could push the globe to the brink. Gernot Wagner, the author of But Will the Planet Notice? How Smart Economics Can Save the World is an economist at the Environmental Defense Fund, an adjunct assistant professor at Columbia University's School for International and Public Affairs and a research associate at Harvard University's Kennedy School of Government.

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