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Conference Paper

Preparing for the blue revolution

Session Handouts, Global Economic Symposium 2009 (GES), 10-11 September 2009, Plön Castle, Schleswig-Holstein, Germany

Provided in Cooperation with:

Kiel Institute for the World Economy – Leibniz Center for Research on Global Economic Challenges

Suggested Citation: Chartres, Colin; Young, Mike (2009) : Preparing for the blue revolution, Session Handouts, Global Economic Symposium 2009 (GES), 10-11 September 2009, Plön Castle, Schleswig-Holstein, Germany, Kiel Institute for the World Economy (IfW), Kiel

This Version is available at:

<https://hdl.handle.net/10419/79118>

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The Global Environment

Preparing for the Blue Revolution

The Challenges

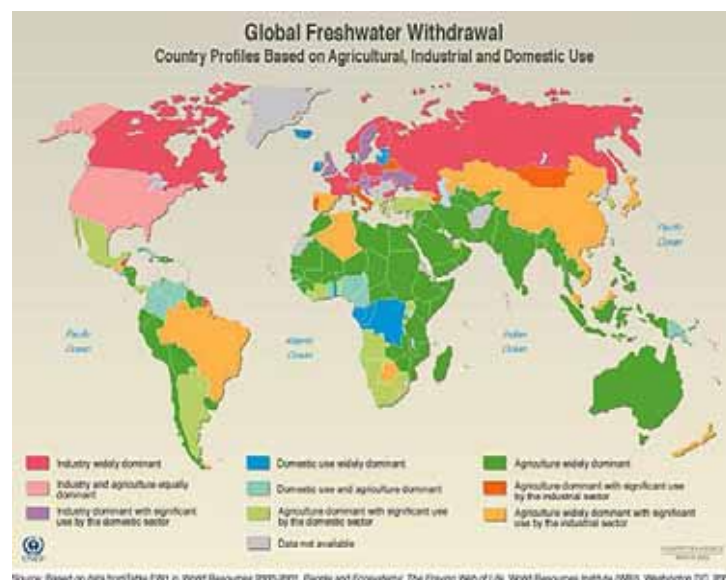
Water shortages are cropping up around the world – from Australia to South Africa, from Brazil to the Sahel. Many of the world’s mightiest rivers run dry before reaching the sea. Perhaps half the world’s wetlands have been damaged or destroyed in the past century as salt water has displaced fresh water. These facts are striking, in view of the fact that the world’s population withdraws less than a tenth of the water that falls to the ground and that – unlike our fossil fuels – the world’s water supplies cannot be used up.



Although some regions suffer chronic water shortages whereas others are repeatedly flooded, water shortages are not merely a local problem to be solved locally. There are powerful world-wide forces at work that are making water a global problem. The first is climate change, which accelerates the rate at which water evaporates and falls and thereby increases our water management problems. The second is demography: in the last half century, the world’s population has grown by 2.5 billion, and it is expected to grow by another three billion in the next half century.

And the third is diet: as people around the world become wealthier, vegetarian diets are replaced by meat, requiring much more water input. To meet these challenges, we require more than local initiatives; what is called for is a “blue revolution.”

How can we reduce the flagrant waste of our water supplies? How can we discourage dry regions and countries from highly water-intensive agricultural products? How can we allocate water efficiently among our various uses – food, industry, services, personal use? How can we ensure that access to water is not inequitably distributed, amplifying the misery of the poor? What is the role of water pricing and sale of water rights in supporting a blue revolution? What role can business play in this revolution? How can the political obstacles to a reform of water management be overcome?





Proposed Solutions

Colin Chartres

Director General of the International Water Management Institute

Reforming water governance

Technological and engineering solutions to double food and feed production are the easier part of the equation to solve if we are to overcome water scarcity and the impact it will have on food production and economic development. Overcoming the social, economic and environmental impediments and obtaining the needed financial investment is the hard part. Making things harder still is the fact that institutional and governance arrangements for water in many countries were designed in the middle of the last century and based on inappropriate models in which water was viewed as an infinite resource.

Governments lack incentives to implement the reforms necessary to ensure more productive and equitable use of water. Fear of potential political repercussions for those who push reform permeate the water and agricultural sectors from top to bottom.

To develop incentives and support for reform, water has to be seen as something that can be valued, and ultimately priced. It can not continue to be treated as a “free” good. This does not mean that the human right to water is overlooked in the process. Few would argue against access to clean water for drinking and sanitation being a fundamental human right that must be protected in any wholesale change to the way water is governed and managed. However, this human right accounts for a very modest amount of total water use. The rest, probably about 90 percent, goes to beneficial uses and the environment. The biggest beneficiary is clearly agriculture.

Measures that governments can take to drive up agricultural water productivity are non-existent in many countries. Clearly the first measure has to be the development of effective water allocation policies, which can be used to reduce allocation as the total pool shrinks or when demands for water resources from other sectors increase. However, allocation policies depend on good water availability measurements, historical data and models and defined water rights.

The most critical solution is to reduce water allocations to agriculture whilst at the same time increasing agricultural productivity. This is a hard task, but by no means impossible. Reduced allocations must be accompanied by support mechanisms for farmers that can improve on-farm efficiency. Currently, if a farmer invests in improving productivity, he or she can keep the water saved and use it to increase the area irrigated. While this may increase food production, it does not solve the problem of reallocation of water to other economic sectors, or to the environment. A real challenge here is to try and develop incentives that link broader society to farmers and lead to broader society paying farmers for the improved environmental services and other benefits that result from improved on-farm water savings.

In the search for improved governance, we must examine the potential solutions that have been and are currently being developed. In parts of Australia and several other countries, a series of mechanisms are used to regulate water use and allocation that depend on seasonal available supply. In the Murray-Darling Basin of Australia, a new system of separation of water and land rights, water trading and water pricing based on supply and demand, has evolved through a combination of market and political forces. The result: water is traded from low to high value uses, which can potentially allow for a market mechanism for trade out of agriculture into urban areas. It is a model worth exploring elsewhere. So long as individual water rights and allocations can be defined, it provides farmers opportunities and incentives to sell temporarily or permanently. It also gives governments opportunities to buy out system tail-end users, improve overall system efficiency and to buy water for environmental flow purposes.



Developing appropriate market-based and other incentives is vital to reform in the water sector. Better definition of water rights and better measurement of water are needed to even contemplate better systems for valuation, pricing, and trade. Without these improvements, will be few incentives to improve productivity whether by the use of economic or regulatory instruments.

Mike Young

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Watering the world: elements of a “blue revolution”

Questions

How is the world going to feed, water, and provide energy to another 2 billion people? The challenge becomes enormous when decides to keep water clean and nurture environmental services. The challenge becomes daunting when one adds the aspirations of many to escape from poverty and others to adopt more water-intensive diets and lifestyles. Factor is some extreme water scarcity and some adverse climate change, plus increased flood risks and one could give up.

To make matters worse, a considerable proportion of the earth’s fresh water resources are over-used. In many areas, there is no more water to be had – smarter use and re-use are the only options available. As a general rule, the environment needs more not less water.

Increasing amounts of water are being used to supply energy and increasing amounts of energy are being used to produce water, clean it and move it around.

As the title to this session implies, it is time for a “blue revolution.” Access to water is one of those factors that limit economic progress. Like financial management, the cost of getting the fundamentals of water management wrong can be very high. Now is not the time for complacency.

Good and bad news

The good news is that the technology and institutional arrangements necessary to meet these challenges exists.

Around much of the world, water use is notoriously inefficient. It is possible to produce much more with much less water. The challenge is to get the investment signals right and empower investment. If we get the signals right and the transaction costs down, there are significant job opportunities.

Similarly, whilst global assessments of infrastructure maintenance and enhancement needs are rare, at the local level, they are well understood.

In many parts of the world, storage, distribution and treatment infrastructure is run down. A 2005 Stockholm Environment Institute assessment of the cost of meeting Millennium Development Goals for water supply and sanitation found that US\$47 billion was needed between 2004 and 2015. When the Millennium Development Goals are viewed through glasses that require economic discipline, these goals become much more achievable.

As pointed out many times before, one way forward is to charge all users the full cost of getting water too them and cleaning it up after they have finished with it. The more people pay, the easier the financial challenge becomes. The more blue water can become part of the solution.

Ecosystem services come free and tend to sequester rather than emit greenhouse gases. Investing in nature is part of the solution.



The bad news is that whilst the policy prescriptions are well known governments are finding the extremely difficult to implement them. The world is littered with policy statements and policy commitments that have been only partially implemented.

Less well understood by people in the water sector are the opportunities to speed the blue revolution by freeing up agricultural trade, signalling the true cost of carbon pollution and making the costs of subsidies transparent. For a blue revolution to work, changes in each of these enabling policy arenas are necessary.

A recommendation for economic discipline

Too many water policies impede change, impede investment and impede innovation. It is time to put in place a series of transitional arrangements that will allow markets to send proper price signals to all involved in the use of water for production, for living and for processing waste without degrading the environmental processes that sustain us.

Many will object to this full cost pricing recommendation. Many see access to water as a basic human right. But, global experience is revealing that whenever governments attempt to supply free access to water, the resultant infrastructure and supply arrangements are substandard. As a result, the poor end up paying more for water than they would have if water was supplied and made available to them at a reasonable price. It needs to be remembered that the opportunity to access potable water supplies empowers people to work more productively. An economically-disciplined blue revolution has a central role to play in the development of a new world order. Water is a basic right but this does not mean that it does not have to be paid for.

A recommendation for smarter entitlement-sharing and allocation arrangements

In order for investment and innovation to occur at the business and community level, Basin and aquifer water sharing and allocation arrangements must be robust. In fully allocated systems, for example, when one person or country is allowed to take more water, arrangements must ensure that someone else takes less.

In recent years, there has been massive investment in Integrated Water Resource Management but little investment in the development of entitlement and allocation systems that facilitate autonomous change and low cost adjustment. Well designed entitlement and allocation systems understand supply risks and encourage individuals to plan for them.

As populations grow, as populations migrate, as rainfall regimes shift and as absolute scarcity limits are hit, water sharing arrangements are going to have to allow markets to have a say in the choice of place where water is consumed and how it is used. The distribution of water is too big a task and too complex a task for governments to control on their own. The use of separate policy instruments to manage equity, efficiency, environmental and social objectives enables the great use of market mechanisms to play a role in the pursuit of integrated outcomes.

A recommendation for “blue” governance

If the above is to be achieved then the prime role of central government is establish the institutional arrangements necessary to facilitate change. Transitional arrangements are needed to allow and catalyse investment and adaptation. Well designed arrangements allow change in a way that is consistent with a well-established set of hydrological, economic and social principles nested within a set of absolute environmental constraints.

Astute blue governance – necessary for a blue revolution – is more about enabling change and less about controlling where change occurs and less about determining who gets access to water.



A recommendation for astute reform sequencing

Rather than dramatic and sudden policy shifts often advocated, a transitional approach may be more appropriate. These transitional pathways will need to pay careful attention to reform sequencing. Policy reforms have to occur in the right order.

- Investment needs to follow the development of robust entitlement, allocation and trading arrangements.
- Metering systems need to be put in place before prices can be set.
- Arrangements that promote investment security and reward innovation need to be in place before water suppliers, water users and communities can be expected to respond.
- Subsidies have to be made transparent before they can be phased out.