Green cooling for warming world

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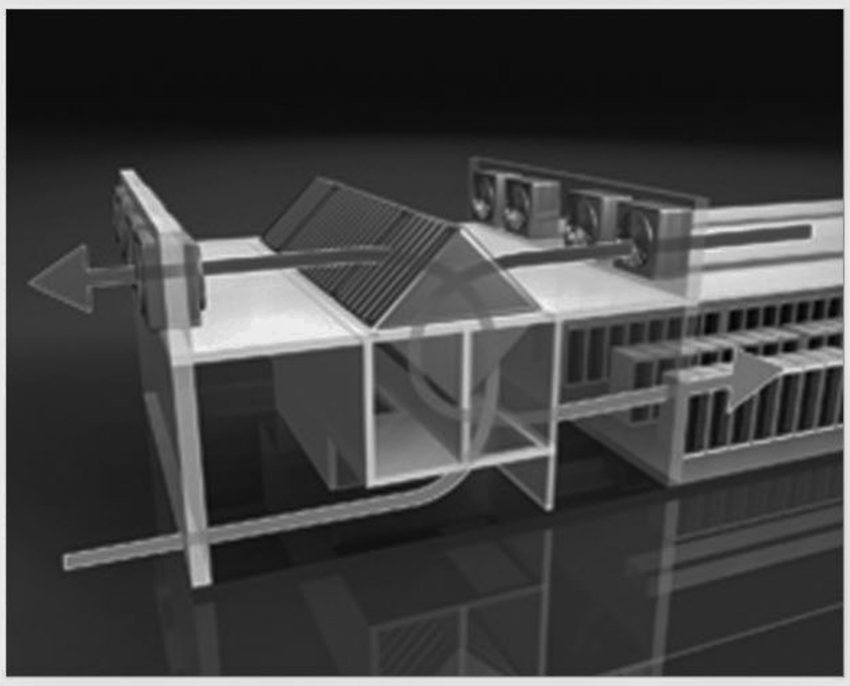
We would require collaborative efforts from industry, governments, implementing agencies and developing partners to adopt strategies of achieving the goal of replacing HCFCs with low GWP and non ODS alternatives.



THE year 2010 was a momentous one in the history for international collaborative efforts in environmental governance. Under the landmark agreement of the Montreal Protocol countries around the world, in collaboration with industry, have individually and collectively succeeded in eliminating the production and consumption of the most severely damaging ozone depleting substances (ODSs), viz, CFCs, CTC and Halons. As many of these ODSs are powerful green house gases (GHGs) this achievement has also had a substantial contribution in mitigating climate change.

Implementing the second phase of the Montreal Protocol, i.e., the phase-out of Hydro-chlorofluorocarbons (HCFCs) which are nearly 2000 times more potent GHGs than CO_2, bear the potential for even more significant climate benefits. In addition to emissions reduction from the phase-out of HCFCs, these are potential opportunities to leap-frog to energy efficient alternatives with low or zero global warming potential (GWP) refrigerants. Accelerating the transition to alternative cooling technologies gases used as refrigerants for common applications like air-conditioning, refrigeration, etc, should seek to meet the dual goal of phasing out HCFCs and reducing climate impacts.

The Asia Pacific region is the largest producer and consumer of HCFCs accounting for 90% of global production and consumption. The rising demand for equipment using refrigerants, particularly in developing countries in the backdrop of the phase-out of HCFCs, will inevitably lead to a massive lock-in of Hydrofluorocarbons (HFCs) in the absence of an urgent action to prevent it. This will require coordinated incremental investments by the public and private sector as well as effective partnerships in the areas of technology development, transfer and information exchange on the availability and capacity building in alternative technologies to support developing countries.

In this ongoing global climate debate, in the aftermath of the Cancun Agreement, business as usual growth scenarios will seriously impair the global consensus on taking all necessary steps to limit the global mean temperature rise to 2°C by 2050. The IEA predicts that such unconstrained rise in global fossil fuel use will drive up energy related CO_2 emission, putting the world on a path to an average temperature increase of upto 6°C.

Growing economic growth linked to energy growth, will need to be balanced with climate constraints. Growing energy demand will be propelled largely by use of energy appreciative equipment, in particular air-conditioning, refrigeration, and lighting appliances in commercial as well household sectors. Accelerated phase-out of HCFCs provides an opportunity to adopt energy efficiency and also to integrate refrigerant standards in a manner that the HCFC phase-out does not result in automatic lock-in to HFCs, which will be counterproductive to the overall GHG emission goals, given that their Global Warming Potential (GWP) is thousand times more that that of CO_2.

The IPCC and the Technology and Economic Assessment Panels (TEAP) in 2005 reported that preventing emissions from ODS banks around the world for the next two decades would be equal to approximately 3-4% of the total radiative forcing from all anthropogenic GHG emissions over the same period. Without immediate action, reachable banks will emit approximately 6 billion tons of CO_2 equivalents by 2015 -- offsetting and surpassing the 5 Gt CO_2 eq reductions sought during the first commitment period of the Kyoto Protocol. The 2009 TEAP task force also points out the urgency of the action as the timing is a critical factor in this matter.

Technological options

HCFC production and consumption is increasing at a rapid pace in developing countries. The rate of growth is 20% in some countries. HCFC-22 represents more than 80% of total HCFC consumption in developing countries. Actual consumption of HCFCs in MT has already exceeded the peak of consumption by 200% and HCFC baseline could be nearly four times higher than the CFC consumption base line because HCFC-22 operated equipment continue to increase number. Other than HCFC-22, HCFC-141b consumption is also increasing in foam sector. Other reason of HCFC consumption increase is also low price of HCFCs than the alternatives, available now.

Alternatives should be :

- Zero ODP (Ozone Depleting Potential);
- Low GWP:
- Enhanced energy efficiency of appliance using low GWP alternatives.

Alternative cooling substances: There are five zero ODP, low GWP and energy efficient natural alternatives which can be chosen during selection of HCFC alternatives, these are :

- Hydrocarbons, viz, R-600a, R-290, Cyclopentane
- NH_3
- H_2O

R-600a can be chosen for refrigerator, R-290 for domestic A.C, and cyclopentane for production of insulation foam. NH_3 can be used for large refrigeration system. H_2O for large A.C system.

We would require collaborative efforts from industry, governments, implementing agencies and developing partners to adopt strategies of achieving the goal of replacing HCFCs with low GWP and non ODS alternatives.

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CLIMATE CHANGE AND THE COMMONWEALTH

Building global resilience

HENRY BELLINGHAM

The official theme for the Commonwealth Heads of Government Meeting (CHOGM) 2011, "Building National Resilience, Building Global Resilience" aptly captures both the challenge of climate change and the strengths of the Commonwealth that make us equipped to meet that challenge.

WITH less than 50 days to go before the Commonwealth Heads of Government Meeting in Perth, Australia, I was pleased to be asked to speak at the Royal Commonwealth Society in London last week about the threat of climate change, and what this means for the Commonwealth.

Climate change is one of the greatest common challenges facing the modern world. I have seen first hand the people and places that are being put in danger by the world's inability to tackle this grave threat.

I believe that a world which is failing to respond to climate change is one in which the values embodied in the Commonwealth will not be met.

Since taking office 16 months ago I have travelled to 23 countries within my portfolio and there is not one country among them where ordinary people are not threatened by global warming.

Although the poorest people will be worst affected by climate change, the extreme weather and floods that it can bring will affect the developed world also.

We know that climate change threatens global security. In July the UN Security Council issued a Presidential Statement recognising the role of climate change as a 'risk multiplier', exacerbating threats in places like Sudan where drought and desertification brought on by climate change played a role in the conflict in Darfur.

We know also that our prosperity depends on our access to food, water and energy. Climate change threatens all of these.

The Commonwealth, of which both the UK and Bangladesh are members, is a network that represents the spectrum of countries affected by climate change, in every continent on the planet, and it is a group of countries that are anchored by shared set of values and a commitment to promoting global peace and stability.

It is my firm belief that the Commonwealth has both a role to play in tackling climate change at a global level, and a chance to seize the opportunities of low carbon growth in trade, investment and new industries.

From business level waste and energy management techniques, through to large scale energy efficient infrastructure planning, creative entrepreneurs are leading change, and businesses as diverse as Fosters and Vodafone have adopted voluntary emissions targets.

Strong intra-Commonwealth business groupings look to promote action,. We can show that climate compatible development is possible for a whole range of economies: from smart metering in the UK to solar projects in Nigeria.

On the global stage the Commonwealth network carries weight when it speaks together. The UN climate conference in Durban at the end of this year matters.

The global politics of climate change are currently at a low ebb - political leaders are understandably distracted by the immediacy of economic crisis. But we are coming to the end of the first commitment period of the Kyoto Protocol in and need to build an ambitious, global, legally-binding regime involving all major emitters. Only a legally binding approach will give business and investors to move rapidly low carbon to keep global temperature rise within 2 degrees.

The official theme for the Commonwealth Heads of Government Meeting (CHOGM) 2011, "Building National Resilience, Building Global Resilience" aptly captures both the challenge of climate change and the strengths of the Commonwealth that make us equipped to meet that challenge.

At CHOGM, we need to set a shared vision of what we need at Durban and beyond: progress this year on issues that really matter to Commonwealth countries, such as delivering climate finance for developing countries; and progress towards a legally binding deal.

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AGRO-TECHNOLOGY

Coping with climate change vulnerability

PROF. SYED ANWARUL HAQUE

Good drainage system has to be ensured to allow new salinity tolerant high varieties to flourish and bring additional food grains to the national food storage system.

BANGLADESH is one of the worst affected countries in the world by climate change effects. Being a delta and located between the Bay of Bengal in the south with off and on depression and the Himalayan mountain ranges in the north with melting glaciers, the susceptibility of the country to natural disasters is quite high.

Agriculture is the mainstay of the country's economy with more than 60% of the populace engaged in it. Rice is the staple food of the people covering roughly 70% of arable land for its production. The importance of rice in day to day life of the people cannot be over-emphasized; we are basically rice eaters. Bangladesh is yet in the transition of attaining self-sufficiency in food and as such the country is still deficit in production of food grains. Production of rice is often subjected to climate variability, often too much rain, sometime less rain/drought that affect the crop in the field often with total damage.

Lately, farmers of greater Rangpur have experienced 'Monga' (extreme constraint) with no work to do as the standing crop was washed away by the rain. Similar problem arose in the one (boro) crop haor areas in Sunamganj of Sylhet district. Just 10-12 days before harvesting of boro rice, the crop was lost due to high rain. To this end, however, breeding activities of BRRI and also BINA have been directed to develop rice varieties for major rice growing ecosystems facing a-biotic stress such as flash flood, tidal submergence, salinity and drought.

Modern rice production technologies developed by BRRI have been playing a vital role in increasing rice production and improving livelihood of the people by reducing poverty and providing food security. Modern rice varieties (HYV and hybrids) have covered 71% of the total rice area and contributed to more than 83% of the total production of 25.18 million tons of rice. BRRI has so far developed 55 new rice varieties and four hybrid varieties, which are already in farmers' fields.

During the last three and a half decades, rice production in the country has increased to 34.26 million tons from 10 million tons in 1970s. These phenomenal achievements have been possible due to extension of rice production technologies developed by BRRI as well as BINA and brought to farmers' doorsteps through the Department of Agriculture Extension agents.

Short duration rice varieties have recently been developed by BRRI and BINA, which are BRRI dhan 33, BRRI dhan 39 and BINA dhan 7. These early varieties of rice have already gone to farmers' fields. These varieties can be harvested in 100 days instead of 140-150 days as required for traditional rice varieties. Farmers have already started practicing the varieties with good harvest and generation of employment. The farmers' got 4-5 tons/hectare of rice yields using newly developed rice varieties instead of 2-2.5 tons/hectare as usually farmers could obtain using traditional varieties.

These early varieties can also be tried in flash flood areas of Sylhet haor floodplains. Early maturity of the varieties could help in harvesting the rice crop before arrival of the flash flood and averting catastrophic loss of crop.

Southern belt, which covers 30% of the arable lands of the country, is affected by varying levels of salinity. Agriculture minister always emphasizes development of this vast area as the possible rice bowl of Bangladesh considering availability of plenty of land not affected by development activities as experienced elsewhere in the country. In saline areas, rice is grown only in the wet (Aman) season, since fresh water (rain) is available, which can wash away the salt from the root zone of the crop. Winter (Boro) crop is not possible due to accumulation of salts at the soil surface through capillary rise of salty water from below. Soil amendment and crop varieties are twin important factors in ameliorating the soil and improving crop production under prevailing salinity situation.

Local rice varieties can withstand mild salinity (up to 4 dSm-1). Salinity affected areas account for approximately 10 lakh hectares. The salinity levels may go up to 8-10 dSm-1. To match the salinity levels, a good number of rice varieties have been developed by both BRRI and BINA. BRRI dhan 40, BRRI dhan 41, have been developed by BRRI, while BINA has developed BINA dhan 8 and BINA dhan 9, which can be cultivated in both Aman and Boro seasons and can withstand salinity up to 8-10 dSm-1. These varieties have high yield potential (4.0 -5.5 t ha-1). However, these varieties are facing some problems being dwarf in height with susceptibility of being submerged during high tide, where water drainage system is not good.

Good drainage system has to be ensured to allow new salinity tolerant high varieties to flourish and bring additional food grains to the national food storage system. Introduction of these varieties in saline areas can boost rice production to about one million tons in addition to existing output and thus is expected to contribute significantly to boost production of rice (Aman) ensuring further food security in the country.

The writer formerly Director of South Asia, Commonwealth Association of Scientific Agricultural Societies (CASAS), is currently serving as Senior Agriculture Specialist, Bangladesh Centre for Advanced Studies (BCAS).